I

An Examination of The Use of Immersive Technology in Pan-Arab Newsrooms

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A THESIS SUBMITTED TO THE UNIVERSITY OF DERBY FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

September 2024

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ACKNOWLEDGEMENTS

Completing this PhD has been a profoundly transformative journey, enriched immeasurably by the unwavering support and guidance of numerous exceptional individuals whom I am privileged to acknowledge.

First and foremost, I express my deepest gratitude to my supervisor, **Prof John Steel**, whose invaluable mentorship and steadfast encouragement have been foundational to my academic growth. His profound insights and constructive feedback have not only shaped my research but also inspired me to push the boundaries of my capabilities.

I also extend heartfelt thanks to **Dr Gurvinder Aujla-Sidhu**, my second supervisor, for her meticulous attention to detail in reviewing my work, and to **Dr Ivana Ebel**, who was a pivotal member of my supervisory team before her departure from the university. Your insightful guidance left an indelible mark on my PhD journey.

I am profoundly thankful to the journalists, news editors, and creative teams at Al-Arabiya, Sky News Arabia, and Al-Sharq, as well as to the experts in the field whose collaboration and insights were pivotal to the success of my research.

My sincere appreciation extends to **Paul Haddad** and **Ayman Abou Chacra**, whose unwavering assistance and support were instrumental in navigating the challenges of the PhD journey over the past three years. I also thank my colleagues at Al-Hadath Channel for their continuous support, reflected in their warm words.

I am deeply grateful to my close friends for their unwavering support, enthusiasm, and shared ambition throughout this journey. Their encouragement has been invaluable and has made this experience fulfilling beyond measure.

To my family, I owe an immense debt of gratitude for their unwavering belief in me. In loving memory of my mother, **Oraib**, I dedicate this achievement to you, knowing you would be proud. Your spirit and love continue to inspire me every day. To my father, **Assad**, your belief in the power of knowledge and your unwavering support have been my guiding light. To my siblings, **Mohammad**, **Asem**, and **Fares**, your unconditional support and encouragement have sustained me through every challenge.

Thank you all deeply for being an integral part of this remarkable journey.

I am deeply thankful to God for His constant presence during my PhD journey, reminding me that I am never alone…

This effort is dedicated to the memory of my beloved mother, Oraib.

I will always cherish and miss you, knowing you watch over me from above…

To my father, Assad, who has always been my rock and my first supporter. Thank you for everything…

To my entire family, who mean the world to me…

To all the mentors and close friends, I have had throughout my life…

To the victims in Gaza and to all those striving for freedom…

This is for you.

ABSTRACT

This research examines the integration of immersive technologies in pan-Arab newsrooms and their impact on journalistic practices. Specifically, it investigates how Al-Arabiya, Sky News Arabia, and Al-Sharq utilise immersive technologies to enhance news reporting. Through qualitative content analysis of 18 videos and interviews with 20 industry professionals, the study identifies thematic patterns in immersive content production and explores the motivations behind their adoption. The findings demonstrate that immersive technologies enhance news presentations by adding visual appeal, interactive elements, and virtual environments, thereby making stories more compelling. Yet, they fall short of providing an immersive experience to their audience. They also enrich storytelling by providing contextual information in visually engaging ways and facilitating remote reporting through virtual studios. The findings also reveal that these technologies are used to simplify the presentation of complex news topics by using visual aids that clarify information and improve viewer comprehension. Also, they are used to compensate for the lack of traditional footage in inaccessible or hazardous locations, enabling journalists to report on events remotely and safely. However, the research identifies challenges such as time-intensive implementation, maintaining editorial integrity, and adapting to a new narrative style. Overall, this study contributes to understanding the transformative impact of immersive technologies on journalism in the Arab region, highlighting their role in enhancing news delivery and broadening reporting capabilities.

Keywords:

Immersive Technology, Immersive Journalism, Virtual Reality (VR), Augmented Reality (AR), Mixed Reality (MR), Pan-Arab Media, Journalistic Practice, Al-Arabiya, Sky News Arabia, Al-Sharq.

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Chapter 1: Introduction

1.1 Introduction

Researchers in the journalism and media fields have long been interested in studying news production; this interest dates back to the 1950s when advances in sociology made it possible for academics to examine the intricate processes involved in news production (Berkowitz and Liu, 2016). Since 2011, and the beginning of uprisings that have swept through the Arab region, scholars' attention has focused on the impact of new and social media in democratizing the region. There has been some attention has been given to how Arab professionals have been using the new technology. As Ayish & Mellor (2015) pointed out, few studies have examined how pan-Arab newsrooms have integrated new and social media technologies into their daily reporting, and whether such technology impacts traditional news values and journalistic practices. The attention has been increasing by scholars and media researchers as new media technologies and modern visual platforms invaded both the journalistic field and the media industry. This research project provides an analysis of pan-Arab media and the most popular Arab newsrooms because of their regional and international outlook and profile. Additionally, it discusses how the new workflows have been developed. This research specifically deals with digital journalism and immersive technology that allows audiences to get more engaged with news stories. Moreover, it illustrates and examines how a significant number of news agencies have been utilizing new technologies in the presentation of their content, and the transmission of their media message in congruence with their editorial policies. Aiming at creating a greater impact on the recipients, news agencies and newsrooms have been able to utilize advanced visual media technologies to attract and engage their audiences. Pan-Arab newsrooms such as Sky News Arabia, al-Arabiya, and Al-Sharq have invested in upgrading their digital tools and hiring staff specialized in handling new edge technology. Integrating immersive technology in Arab newsrooms marks an exciting change in how news is made and shared. By using tools like virtual reality (VR) and augmented reality (AR), news organizations can tell stories in more engaging and visually interesting ways. However, this shift comes with challenges. As Arab newsrooms embrace these new formats, many changes affect journalistic practices. The embracing of this technology was founded on the belief that the news content will be more appealing to the audience to distinguish each channel's content in a saturated field. The findings of this current study will not only contribute to the literature on Arab digital journalism but will also inform the Arab journalists' community and news agencies. The study will also benefit

the Arab audience as it will contribute to the public debate about the influence and significance of such technology on public opinion across the region.

This research aims to fill a crucial gap in Arab literature by specifically exploring the integration of immersive technology in Pan-Arab newsrooms. This area remains significantly underexplored in existing Arab studies. While there is a growing body of literature on media innovation globally, the unique context of Arab newsrooms has received limited attention, particularly in how immersive technologies—such as virtual reality and augmented reality—are being adopted and adapted within this region. By investigating the practical applications and impacts of these technologies in Arab media, this study provides valuable insights into the challenges and opportunities faced by journalists and news organizations in an increasingly digital landscape. Moreover, this research facilitates comparative information with Western studies, allowing for a nuanced understanding of how immersive technology is utilized in different cultural and operational contexts. By shedding light on how Arab newsrooms leverage these technologies, the study highlights both the innovative practices and the barriers unique to the region. This comparison not only enhances the body of knowledge surrounding media practices in the Arab world but also encourages dialogue on best practices and potential collaborations between Arab and Western news organizations. Ultimately, this research aims to contribute to a deeper understanding of the evolving landscape of media in the Arab region and its alignment with or divergence from global trends in immersive technology.

1.2 Research problem and gap

Traditional journalism research has often centreed on the role of professional journalists as gatekeepers, a concept that highlights their control over the flow of information and the boundaries they maintain against amateurs or non-journalists (Josephi, 2016). Historically, journalism was viewed as a means to communicate information, particularly about political matters, thereby aiding the public in forming informed opinions. This gatekeeping role implied a level of authority and objectivity, positioning journalists as trusted sources within the public sphere. Media organizations, including TV networks, radio stations, newspapers, magazines, news websites, and other news providers, play the gatekeeper function by concentrating on particular news items in accordance with their priorities (Shoemaker et al., 2009). As a result, these news outlets extract news from a variety of sources, leaving it open to modification (ibid, 2009). According to editorial policies and news agendas, the news is susceptible to censorship, which may result in it being reformed, having portions of it eliminated, or having information

added to some of it through a series of stages (gates) (Shoemaker and Vos, 2009). Due to recent political, social, and economic developments, journalistic practices have evolved. A change has occurred in the way news is chosen in relation to organizational agendas and the function of journalists as gatekeepers. This position has also been impacted by technology (Perreault, 2022). However, they adjusted to the new environment of change through the surge in social media platforms and digital media tools. With the development of the Internet, news dissemination has become incredibly quick, and audience engagement has expanded and reached new heights, particularly in the wake of citizen journalism, which uses ordinary people as a primary source of news (Habermas, 2010; Alsaeedi, 2021). However, the perspective of gatekeeping has undergone a significant transformation with the rise of new and social media, as well as digital journalism, which have reshaped the landscape of news production and consumption. The emergence of digital platforms has not only democratized the flow of information but has also highlighted the subjective views of journalists, challenging the notion of impartiality that was once a hallmark of traditional journalism. The trend of citizen journalism has further blurred the lines between professional and amateur reporting, allowing ordinary individuals to contribute to news narratives and thereby reshape public discourse (Josephi, 2016). In addition, the integration of algorithms and tools like virtual reality (VR) in newsrooms has introduced new ways for audiences to engage with news content, creating immersive experiences that enhance storytelling and foster deeper emotional connections with news events.

Based on the above, addressing the research problem indicates that the integration of immersive technology, such as Virtual Reality (VR) and Augmented Reality (AR), into newsrooms has sparked considerable interest in Western media landscapes. Research into this technology primarily focuses on how it enhances audience engagement, emotional connection, and storytelling effectiveness. However, there remains a significant gap in the literature regarding the application and impact of these technologies in non-Western contexts, particularly within Pan-Arab newsrooms. This gap underscores an opportunity to explore how immersive technologies could transform news consumption and production in this diverse and culturally rich region. In Western media research, VR is often hailed for its potential to create deep emotional engagement and empathy. Studies such as those by Slater and Wilbur (1997) highlight how VR can immerse users in experiences, fostering a sense of presence and emotional involvement. For instance, *The New York Times* has utilized VR to provide users with first-person perspectives on global events, aiming to enhance emotional connection and

narrative immersion (Gynnild et al., 2020). This approach aligns with the Western journalistic ethos of creating compelling, emotionally resonant content to drive engagement and impact. However, the question arises: How might the purposes and effects of VR in news differ in the Pan-Arab context? The Western media industry's embrace of virtual reality (VR) and other immersive technologies reflects a complex interplay of technological innovation, cultural trends, and commercial imperatives (Slater and Sanchez-Vives, 2016). While these advancements offer unprecedented opportunities for storytelling and audience engagement, their adoption is not solely driven by the pursuit of technical progress. Rather, it is deeply rooted in the industry's need to maintain relevance and competitiveness in an increasingly fragmented media landscape (Jenkins et al., 2014). The emphasis on emotional engagement through immersive experiences can be seen as a strategic response to the challenge of capturing and retaining audience attention in an era of information overload (Sundar et al., 2017). By leveraging VR's capacity to create visceral, emotionally resonant experiences, media companies aim to forge stronger connections with their audiences, fostering a sense of loyalty that transcends traditional forms of media consumption (de la Peña et al., 2010). In contrast, Pan-Arab newsrooms might face different pressures and objectives, such as addressing regional conflicts, promoting national unity, or navigating state censorship. The influence of Western media practices on Pan-Arab newsrooms cannot be ignored. Western media's success with VR could inspire Pan-Arab newsrooms to adopt similar technologies, potentially leading to the adaptation of these practices to fit regional needs and cultural contexts. Conversely, Pan-Arab media's unique challenges and goals might drive the development of innovative VR applications that differ significantly from Western approaches. The gap in research concerning immersive technology in Pan-Arab newsrooms highlights a critical area for exploration. Understanding how VR and AR are used and perceived in the Pan-Arab context can offer valuable insights into the broader implications of these technologies for global journalism. By examining the application of immersive technology in the Arab world, researchers can contribute to a more nuanced understanding of how these tools can be adapted to meet diverse needs and objectives in different regional contexts. This project aims to examine the development of digital journalism within pan-Arab newsrooms, focusing specifically on its impact on traditional Arab news values. It will explore how these changes influence the role of Arab journalists, particularly in emphasizing immersive approaches to news dissemination. By analysing how journalists have integrated immersive tools into their reporting practices, this research will shed light on the evolving nature of journalism in the Arab world. The findings will illustrate the challenges and opportunities presented by digital advancements, ultimately

contributing to a deeper understanding of how traditional values are being adapted in the context of rapidly changing media environments.

1.3 Research theoretical framework

This study adopts a dual theoretical framework. By synthesizing Pierre Bourdieu's sociological insights with Actor-Network Theory's (ANT) relational perspectives, this thesis significantly contributes to advancing knowledge about the transformative impact of immersive technologies on journalistic practices within Arab media contexts. Bourdieu's field theory provides a lens through which we can understand the social dynamics and power structures that influence how journalists engage with emerging technologies. It highlights the roles of capital, habitus, and doxa in shaping the behaviors and perceptions of media professionals, offering a rich understanding of their experiences in integrating immersive tools into their work. Meanwhile, ANT emphasizes the relational aspects of technology adoption, focusing on how human and non-human actors interact within networks to co-create meaning and practices in journalism. This dual theoretical framework allows for a comprehensive analysis of the complex interplay between technology and journalistic practice, shedding light on how immersive technologies not only reshape the news production process but also challenge traditional notions of journalism. The insights gleaned from this theoretical synthesis serve as a robust framework for interpreting the empirical findings derived from qualitative content analysis of the selected videos and the interviews conducted with professionals and experts. By exploring how immersive technology is applied in Arab newsrooms, the research reveals critical implications for both the future of journalistic practices and the evolving landscape of media consumption. As the media landscape continues to evolve, understanding these dynamics will be essential for practitioners and scholars alike. By illuminating the relationship between technology and journalism, this research offers valuable insights that can inform industry practices and guide future studies in the field. Overall, the theoretical framework developed not only enriches our understanding of immersive journalism in the Arab context but also serves as a springboard for further exploration into the multifaceted implications of technological advancements in media worldwide.

By integrating these theoretical perspectives, this study not only sheds light on the unique characteristics of immersive technology usage in Arab newsrooms but also facilitates a richer comparative analysis with Western studies, highlighting both shared experiences and distinct challenges. Ultimately, this dual theoretical approach aims to provide a comprehensive

understanding of the transformative role that immersive technologies play in shaping contemporary media practices in the Arab world.

1.4 Research methodology

This study used an exploratory approach, which is characterized as "an investigative approach to a problem that is not well defined" (QuestionPro, 2018). It is carried out in order to have a deeper comprehension of the current issue. Put differently, according to Dudovskiy, (n.d.), this technique is "often conducted using interpretive research methods and they answer to questions such as what, why, and how." Therefore, as immersive storytelling is a relatively recent trend in visual journalism in general and pan-Arab newsrooms in particular, it is important to know and look into whether the creation of immersive material is governed by any forms, rules, or formulae. Exploratory research "is often qualitative in nature"(George, 2021). This study follows a qualitative approach. Qualitative methods "explore the reasons and motivations for perceptions, beliefs, and behaviors of people and can produce a better understanding of the lived experiences of people… primarily involve observing and talking to people" (Donley and Grauerholz, 2012, p. 40). Therefore, this methodology is chosen because it focuses on the interpretation of communications, as well as on journalists' perceptions and experiences. This contrasts with quantitative methodologies which are usually used to measure certain aspects (e.g., the repetition of certain terms in the news) without examining the interpretations of such aspects. This study's goals and research objectives are best served by the qualitative method, which attempts to explain the link between immersive technology and news content and show how immersive technology is used in pan-Arab newsrooms. By adopting immersive technology, the researcher intends to investigate the advantages of Arab news channels and comprehend why media outlets use it. Through this research, issues about how technology supports journalistic material and the difficulties this new trend in news work faces will be addressed. Accordingly, this study adopted qualitative content analysis as its primary method for examining the integration of immersive technology in journalism. This approach was applied to 18 carefully selected videos from prominent Arab news channels, specifically Al-Arabiya, Sky News Arabia, and Al-Sharq. By focusing on qualitative content analysis, the research aims to uncover underlying themes, patterns, and narrative structures within the visual storytelling of these videos, allowing for a nuanced understanding of how immersive technologies are utilized in the production of news content. In addition to the video analysis, the study included interviews with 20 professionals working within these news

organizations and experts from outside these outlets. These interviews provided valuable insights into the perspectives and experiences of journalists and media professionals as they navigate the challenges and opportunities presented by new technologies. By combining qualitative content analysis of the videos with in-depth interviews, the research captures a comprehensive view of the dynamics at play in contemporary Arab newsrooms. This dual-method approach not only enriches the data collected but also allows for triangulation of findings, ensuring a more robust interpretation of how immersive technology influences journalistic practices and the broader media landscape. Ultimately, this study seeks to contribute to the growing body of knowledge on digital journalism and its implications for news reporting in the Arab world. When differentiating between the modes of analysis for the content analysis of videos from the selected channels (Al-Arabiya, Sky News Arabia, and Al-Sharq) and the analysis of interview transcripts with 20 professionals and experts, it is crucial to acknowledge the distinctive nature of these data sources and the methodologies employed. Content analysis, as conducted on 18 selected videos, entails a systematic examination of textual and media content to discern patterns, themes, and underlying meanings through structured coding (Krippendorff, (2019); Neuendorf, (2017). This methodological approach involves categorizing elements such as visual cues, discourse patterns, and narrative strategies employed by news channels in presenting information. In contrast, analysing interview transcripts with professionals and experts necessitates a more interpretative and qualitative approach. Researchers delve deeply into the nuances of participants' narratives, employing techniques such as thematic analysis to uncover emergent themes and contextual meanings within the personal accounts shared (Braun & Clarke, (2006); Rubin & Rubin, (2005).

In conclusion, this research methodology significantly contributes to addressing the identified research gap by employing a qualitative approach that combines content analysis and in-depth interviews. By analysing 18 videos, the study investigates how immersive technologies are represented and utilized in Pan-Arab newsrooms, allowing for a nuanced understanding of their application in real-world contexts. This content analysis not only highlights the innovative practices and storytelling techniques employed by journalists but also reveals the broader narrative surrounding the integration of these technologies in Arab media. Complementing this analysis, interviews with 20 professionals in the field provide rich, firsthand insights into the experiences, challenges, and motivations of those directly engaged with immersive technologies. This qualitative data helps to contextualize the findings from the content analysis, illuminating the factors that influence technology adoption and use within

Arab newsrooms. Together, these methodological components foster a comprehensive exploration of the dynamics at play, filling a crucial void in the existing literature on immersive technology in Arab media. Ultimately, this approach not only enriches the understanding of current practices but also lays the groundwork for future research in this emerging area.

1.5 Research objectives and questions

This project aims to explore how immersive technologies are used in pan-Arab newsrooms. This topic has become more significant as news outlets and media organisations begin integrating such technologies into their journalistic practice, and the use of these technologies has thrown up the requirement to understand and examine how immersive technology is used in those newsrooms. This research examines the way journalists have integrated new digital tools into their reporting. The research illustrates how this technology has been implemented in daily reporting, and how it presents Arab journalists with a new set of opportunities as well as challenges. Hence, the objective of the current investigation is:

- To contribute to the emerging field of immersive journalism.
- To demonstrate the way immersive technologies in pan-Arab newsrooms are used to inform the audience.
- To shed light on Arab journalists' understanding of their field and their roles. This project investigates the impact on their journalistic practices.
- To understand the impact of using this technology on news values.
- To examine the audience appeal of this technology, as defined by news producers and technologists.

Guiding this research were the following research questions, followed by an explanation for each research question:

- **RQ1: What thematic patterns have been applied via immersive technologies in pan-Arab newsrooms' reporting?**

This question seeks to identify and analyse the recurring themes in the use of immersive technologies, such as virtual reality and augmented reality, within pan-Arab news reporting. By examining the content and context of immersive news stories, the research aims to reveal how these technologies enhance the narratives.

- **RQ2: Why have pan-Arab newsrooms integrated immersive technologies in their reporting?**

This inquiry explores the motivations behind the adoption of immersive technologies in newsrooms. It considers factors such as competition for audience attention, the desire to innovate storytelling methods, and the need to adapt to changing consumer preferences in the digital age, thus highlighting the strategic importance of these technologies in contemporary journalism.

- **RQ3: How have immersive technologies been applied in the field of storytelling within pan-Arab newsrooms?**

This question focuses on the specific ways immersive technologies are utilized in crafting news narratives. It examines the techniques and practices adopted by journalists exploring the interplay between technology and traditional storytelling methods in news reporting.

- **RQ4: What opportunities do immersive technologies present for pan-Arab newsrooms in their reporting?**

This research question aims to identify the potential advantages that immersive technologies bring to pan-Arab newsrooms, including enhanced news content, improved information retention, and the ability to cover complex stories more impactfully. It explores how these opportunities can lead to more innovative and compelling journalism.

- **RQ5: What limitations do pan-Arab newsrooms face while applying immersive technologies in their reporting?**

This question examines the challenges and barriers that pan-Arab newsrooms encounter in the integration of immersive technologies. These may include technical limitations, resource constraints, the need for specialized skills, and potential ethical considerations, providing a comprehensive view of the hurdles that must be addressed for successful implementation.

1.6 The structure of the thesis

This thesis contains nine chapters as follows:

Chapter One: The first chapter provides an introduction to the research background and the rationale for conducting the study. It also sheds light on the objectives and scope of the study.

Chapter Two: This chapter focuses on delivering an in-depth overview of the pan-Arab media landscape, exploring aspects such as their nature, funding sources, and the conditions surrounding their inception. It seeks to provide a thorough understanding that includes not just the identification and operational reach of these media organizations, but also contextual influences that have contributed to their creation.

Chapter Three: This chapter explores immersive technology, focusing on its definition, applications, and significant effects on journalistic practices. Covering forms like virtual reality (VR), augmented reality (AR), and mixed reality (MR), it discusses how these technologies engage audiences and enhance storytelling. The chapter examines their use in media, from immersive reporting to interactive documentaries, highlighting both the opportunities for compelling narratives and the challenges journalists face. It also addresses ethical considerations, technical limitations, and evolving standards that influence the integration of immersive technology in journalism, setting the stage for future advancements in the field.

Chapter Four: This chapter uses a theoretical framework to analyse the collected data. Actor-Network Theory (ANT) is applied to the video data, emphasizing the relationships between technological artifacts, human actors, and their environments. Meanwhile, Bourdieu's Field Theory is used to assess the interviews with professionals and experts, investigating how individuals in Pan-Arab newsrooms manage the complexities of integrating immersive technologies.

Chapter Five: This chapter outlines the study's methodological approach, which employs a qualitative and exploratory framework to investigate how and why immersive technology is integrated into the news reporting practices of Al-Arabiya, Sky News Arabia, and Al-Sharq. The study utilizes visual content analysis, examining 18 videos—6 from each channel—to explore the narratives shaped by immersive technologies and their value in enhancing news delivery. Additionally, insights from interviews with 20 professionals and experts in immersive

journalism enrich the analysis, providing qualitative data and perspectives from those directly involved in implementing these technologies.

Chapter Six: This chapter presents a detailed analysis of the collected videos using thematic analysis, focusing on understanding meaning rather than quantifying data. This approach is well-suited for examining how immersive technology is used in pan-Arab newsrooms. Thematic analysis helps identify and report patterns within the data, organizing it in rich detail. The researcher analyses the data to uncover recurring themes—topics and ideas that appear frequently—creating an organized list of codes to categorize these patterns. This method is essential for ensuring a consistent and reliable coding process in the analysis.

Chapter Seven: This chapter analyses interview transcripts from 20 industry professionals, divided into four groups. These include the News Desk, consisting of editors, journalists, writers, reporters, and producers; the Creative Desk, comprising video graphic designers, video editors, and visual technicians; and the Decision-Making group, which includes general managers, editors-in-chief, and news directors from the selected news channels (Al-Arabiya, Sky News Arabia, and Al-Sharq). The fourth group consists of Experts, who are senior professionals from external channels engaged in news story scripting or visual content creation within immersive journalism.

Chapter Eight: This chapter is a separate discussion one, that contributes to offering a fuller picture of the dynamics at play. It highlights this study's specific contributions, such as its impact on the understanding of journalists' roles, Arab news values, and the influence of technology in Arab newsrooms.

Chapter Nine: The final chapter outlines the key findings and limitations of the study. It also offers practical recommendations and suggestions for future research.

Chapter 2: Background of Pan-Arab Media Landscape

2.1 Introduction

This chapter aims to provide a thorough examination of the pan-Arab media landscape, including insights into their nature, funding sources, and the circumstances surrounding their inception. It seeks to offer a comprehensive overview that not only identifies and defines these media entities but also explores their financial backing and the contextual factors that influenced their founding. Understanding these aspects is crucial for comprehending the role and impact of Arab media organizations within their region. A significant number of these channels were launched during the 1990s and early 2000s, leveraging satellite technology to reach a wide audience beyond national boundaries. Their establishment often coincided with periods of political liberalization or economic growth in certain Arab countries, which facilitated greater private investment in media ventures (Sakr, 2001). Understanding these foundational aspects is critical as this research investigates the transformative impact of immersive technology on the news industry. By analysing leading pan-Arab news channels such as Al-Arabiya, Sky News Arabia, and Al-Sharq, the chapter sets the stage to examine how immersive technologies have modernized traditional news production methods in the Arab region. It is essential to illuminate the media landscape to explore how these technologies enable more interactive and compelling news delivery, thereby boosting audience engagement and expanding the reach of news dissemination. This exploration not only assesses the practical implications of technological advancements but also clarifies their influence on journalistic practices and ethics in the dynamic media environment of the Arab world. By bridging the gap between technology and journalism, this study aims to offer a nuanced understanding of how these dynamics intersect within selected pan-Arab newsrooms, highlighting the evolving nature of news reporting and consumption in the digital era.

2.2 The beginning of news TV channels in the Arab region:

Mellor (2011) demonstrated that after the Arab countries gained their independence, attention was paid to how to use media as a way to mobilize Arab public opinion. In that time, according to Mellor, Journalists were considered official spokespersons for Arab regimes while political turmoil had pushed the process of mobilization forward, starting from the so-called (AL-Naksa) as Arabs refer to the defeat in 1967 and then the Gulf War in 1991, aiming at ending the Iraqi invasion of Kuwait. Mellor clarified that the Gulf War was one of the evident

motivations for media reform in the Arab region, as many Arab countries launched their governmental satellite channels, giving away the other private satellite channels to enter the market (p. 27). However, some observers believe that those private satellite channels were created by countries as an "'instant weapon' at the time of the 1991 Gulf War without any accompanying legislation to oversee their independence. These observations align with the finding that governments in the region still had the upper hand in the evolution of Arab satellite television a decade after it took off" (Sakr, 2007, p. 2). The Gulf War was a largely televised one, as people all over the world, especially Arabs, were able to watch bombing and military attacks live on screens. Although American networks such as the American Broadcasting Corporation, CBS, and NBC covered the war, CNN gained huge popularity to the extent that the Colonel military expert Harry Summer said that "the most lively and adventurous television coverage has ever been made was done by CNN" (Al Moqatel - Cable News Network CNN). Perhaps Colonel Sommer's speech fully corresponds to the description given by Peter Arnett, who was the senior correspondent for CNN in Baghdad, during the second Gulf War, as he mentioned in his book The Media and the Gulf War: An Eyewitness Account that the name given to that war was the "CNN War" (Arnett, 1997). Before the end of that year, in September 1991, Riyadh, the capital of the Kingdom of Saudi Arabia, decided to launch MBC as the first Arab channel in the region. This is considered the first establishment of the Arab private media outlet. MBC "is owned by Arab Group International Holding Company, which is owned by Walid al Ibrahim, a relative of the" Saudi royal family (Mellor, 2011, p. 14). Speaking about its history, MBC published the following on its website under the title History of the Group:

"The beginning of MBC's independent satellite broadcasting gave rise to a new entertainment era in the Arab world. This new wave of entertainment reached the Arab community around the world through fun, engaging, and informative content. Being the first private and non-encrypted free-to-air Arabic satellite channel, MBC TV was a pioneer in this domain, shouldering the responsibility of being creative and innovative with its content that is broadcasted to millions across the world" (MBC).

This channel's content was started with entertainment topics, related to health, arts, social news, and other various topics. Despite the entertaining content, MBC launched a few news programmes and bulletins that represented a precedent not seen in the Arab world, but it was not a specialized news channel in the literal sense of the word.

In 1996, the first specialized news channel in the Arab region was launched under the name Al-Jazeera by the Qatari regime, located in the capital Al-Doha in Qatar. It is possible to say that while MBC was the birth of the Arab satellite channels, Al-Jazeera was the birth of the political channels that purely focused on news. In other words, unlike the earlier general entertainment channel, MBC (which played a major role in the rise of satellite TV in the Arab region), Al-Jazeera focused exclusively on news coverage, positioning itself as a groundbreaking platform for political and current affairs programming. The purpose of Al-Jazeera's founding was to become self-financing through advertising revenue in five years while expecting good viewership numbers (Sakr, 2007). Its failure to achieve this goal exposed the politicized nature of advertising sales in Arab television, but Qatar's ruler, Sheikh Hamad bin Khalifa Al Thani, kept funding the channel regardless, characterizing this "as a public service consistent with Qatar's project of turning itself into a parliamentary democracy" (ibid, 2007, p. 6). It was acknowledged at the time by Al-Jazeera's managing director that the television station brought Qatar non-financial benefits. However, these benefits seemed consistent with "a model of state-funded broadcasting that Qatari officials regularly likened to the BBC" (ibid, 2007, p. 6). Al-Jazeera has become a symbol of courage in the Arab world, challenging the establishment and providing a forum for free speech in an era in which propaganda is widespread (Cherribi, 2017, p. 3). By 2006, "Al-Jazeera channel becomes Al-Jazeera Network, after being heralded as one of the world's most popular commercial brands" (ibid, 2007, p. 3). Since its inception in 1996 and for more than 5 years, Al-Jazeera has represented the only Arab news outlet specialized in covering events in the Arab world in particular. Al-Jazeera "rose to prominence during its coverage of the war on Afghanistan" (Lahlali, 2011, p. 88). Moreover, as Ayish and Mellor agreed, Al-Jazeera "gained worldwide attention in the aftermath of the US invasions of both Afghanistan (2001) and Iraq (2003)" (2015, p. 70).

Being the leading and the only Arab-specialized news channel in the Arab world, representing a specific political agenda without having one or more parallel Arab counterparts, prompted the imperative, which is to find a competing news channel carrying another political point of view that may not fully agree or completely disagree with Al-Jazeera's agenda. To illustrate this point, Al-Jazeera "gave Islamic leaders and dissidents of various Arab regimes broader access to transnational Arab publics than they could have ever before dreamed of reaching" (Cherribi, 2017, p. 4). While this may fall, according to what Al-Jazeera is used to talking about, under the slogan it launched, The Opinion and the Other Opinion, this may not

be in line with the visions of other countries or other governments in the Arab region. Al-Jazeera also launched Al-Jazeera Mubasher in 2005 as a live news service channel, which specializes in covering live events, such as press conferences held by heads of state and ministers and seminars held by political parties. Al-Jazeera Network unveiled in 2011 “the updated version of its live broadcast channel, Al-Jazeera Mubasher, with a refreshed look and content aimed at boosting the channel’s real-time interactivity with its viewers” (Albawaba, 2011).

2.3 Pan-Arab media post-2003 war

MBC, The Saudi network that I referred to at the beginning of this chapter about the birth of satellite channels in the Arab world just after the Gulf War, found that it had both the ability and capability to launch a specialized news channel, enriching the Arab media with specialized news content, so that the market does not remain monopolized by anyone. After nearly six years of Al-Jazeera's uniqueness as an Arab player in the news field, MBC succeeded in launching the Al-Arabiya News Channel based in Dubai Media City as a headquarters in the United Arab Emirates. It is worth mentioning that Al-Arabiya Channel relocated its headquarters to the Saudi capital in 2023 as part of a new plan for the channel's next phase. On March 3, 2003—the 20th anniversary of the channel's founding—live broadcasts from the new newsroom in Riyadh commenced (Shar, 2023). Al Arabiya began covering the Iraqi war in 2003. It has been rated among the best Arabic stations by Middle Eastern audiences, even though it was just getting started (BBC, 2003). According to journalist and political writer Nizam al-Din (2017), Al-Arabiya channel had roots in the field of news work with the launch of MBC, where a remarkable action took place after The Gulf War, as former US President George Bush Sr called for a peace initiative in the Middle East, as the Arab countries agreed to attend the Madrid Peace Conference on November 20, 1991. Nizam al-Din indicated that MBC was able to be the first to broadcast this event live on the air as the first satellite channel in the history of Arab media. At the launch of Al-Arabiya, it was “considered a real competitor to Al-Jazeera in the region” and was criticized by Riyadh since 1996 for airing videos from Osama Bin Laden (Lahlali, 2011, p. 109). The reason was that Bin Laden was considered an enemy of Saudi Arabia, as he was the prime suspect in the attacks on US soldiers in Saudi Arabia in 1995 and 1996, accused of masterminding the 1998 attacks on the US embassies in Kenya and Tanzania, responsible for the attack on the USS Cole in Yemen in October 2000 (BBC, 2011). His family disavowed him, and the Saudi government stripped him of his

citizenship (ibid, 2011). However, Al-Arabiya's founder, the Saudi Sheikh Waleed al-Ibrahim, indicated that “Al Arabiya represents a more moderate option than Al-Jazeera” (Ismail, 2018, p. 35). The former General Manager of Al Arabiya, Abdul Rahman Al-Rashed, indicated that “during the early years of broadcasting, Al-Arabiya distanced itself for a long time from the question of competition with Al-Jazeera and tried to position itself behind professional considerations” (Nafe, 2017).

Increasingly, Al-Arabiya has attracted high viewership, so that the market is no longer monopolized by Al-Jazeera (ibid, 2017). Conducted by Ipsos Stat, which specializes in visual media research, on a sample of residents and citizens of the Kingdom of Saudi Arabia, the Gulf states, and the Middle East in 2006, that is, three years after its launch, results showed that Al-Arabiya was the first source of news. On the other hand, Waddah Khanfar, the former director of Al Jazeera, commented on this competition setting out this vision for the channel, saying:

“We are expanding globally because, for us, the competition is not Al Arabiya. They may have been set up to compete with us, but for the competition (and I say this in the collegial spirit of friendship and cooperation) it is the BBC World Service and CNN International because we see ourselves as a global broadcaster on the merits of our coverage and the fullness of our vision” (Lahlali, 2011, p. 87).

Based on the aforementioned circumstances of the emergence of the first two Arab news channels, it can be said that Al-Jazeera and Al-Arabiya were the pivotal poles of Arab news work. With the Arab Spring, which was launched in Tunisia in 2011 after popular protests that toppled the regime of the late President Zine El Abidine Ben Ali, the media climate became ripe for the emergence of other news channels or the emergence of new players. This period also witnessed protests in Egypt, Libya, and Yemen, that led to the change of the regimes through the masses’ emergence in the form of demonstrations and protests, which roamed their streets and squares, and in every geographical area of these countries to demand reforms in various fields (Al-Mousawi and Allawi, 2015). Hence, 2012 witnessed the birth of other Arabic regional channels, as I could discuss some of the most significant channels that were able to spread in the Arab world and gain the audience's attention, since the news dealt with the events of the Arab Spring, as a popular political phenomenon that quickly moved among Arab capitals.

Al-Hadath is a sister channel of Al-Arabiya, which is a subsidiary of the MBC Group. Al-Hadath started broadcasting at the beginning of 2012 as a news service channel, concerned in particular with monitoring the political situation in the Arab region and providing more coverage of the Arab revolutions in the form of long and extensive follow-ups in this regard (Al-Arabiya, 2014). Al-Hadath was able to be among the most-watched news channels, even competing with its sister channel, Al-Arabiya. As long as Al-Arabiya channel has been talked about at the beginning of this chapter, especially the most important issues related to its launch and its general features, there is no need to elaborate further on the Al-Hadath, the sister channel, which is under the mentioned MBC Group.

Another notable example of a political channel in the Arab media landscape is Al-Mayadeen, which was launched in 2012. Based in Beirut, Lebanon, Al-Mayadeen focuses on providing in-depth political coverage with an emphasis on Arab and Middle Eastern affairs. According to Al-Bishr (2017) Al-Mayadeen TV is an Arab news satellite channel affiliated with Al-Mayadeen Media Network and founded by the Tunisian journalist and activist Ghassan Ben Jeddo, who said that the network's budget started with nearly $40 million. Ben Jeddo had worked “for Al-Jazeera channel but left the Qatari television service over what they perceived as its skewed reporting of Syrian news” (Ayish and Mellor, 2015, p. 71). Al-Bishr’s study pointed out that the channel’s correspondents are spread in many countries of the world and the Arab region from Moscow to Washington, London, Tehran, Pakistan, Afghanistan, and Europe to Turkey, Egypt, Tunisia, and others. He also indicated that the network began through a merger between Al-Ittihad channel, owned by Nayef Karim, and the media project launched by Ben Jeddo under the name Al-Mayadeen. Regarding the name, Al-Bishr clarified that the channel took its name from the famous Tahrir Square in Egypt and the Arab Squares that embraced the Arab revolutions, as the name of the channel "Al-Mayadeen" means Squares in English, adopting the slogan “Reality As It Is”. Al-Bishr believes that Al-Mayadeen TV is one of the channels most opposed to Arab regimes and governments, apart from the Syrian and Lebanon regimes, due to the great support the channel receives from the Islamic Republic of Iran. The channel has adopted the time of the city of Jerusalem, in a sign of interest in the Palestinian issue, to confirm, according to what it publishes on its website:

“Al-Mayadeen sees the Palestinian issue as the title of national liberation, hence its central role in the channel. Al-Mayadeen addresses the Palestinians as one people in their homeland, in the diaspora, and at home as an integrated whole, including the Palestinians of the 48 lands.

Also, the issue of prisoners inside Israeli prisons is of constant interest. Al-Mayadeen rejects any external hegemony and supports the right of peoples to resist the occupation, on top of which is the Israeli occupation of Palestine and the Arab lands" (Al-Mayadeen).

Sky News Arabia is another regional news channel launched on May 6th, 2012, as a result of a partnership between Abu Dhabi Media Investment Company, a private investment firm, and Britain's leading cable TELEVISION company Sky News, the British channel which gained popularity since its launch in 1989 as Europe's first 24-hour news channel, reaching more than 90 million homes in Europe, Africa, the Middle East, Asia, Australia, and New Zealand (Sky News Arabia, 2011). Based in Abu Dhabi, Sky News Arabia began broadcasting from the twofour54 media area before its management decided to move to the new main headquarters also in Abu Dhabi, and it has a network of offices in the Middle East and North Africa, as well as offices in London and Washington, benefiting from a network of offices and correspondents of Sky News UK around the world (ibid, 2011). The channel was first run by Nart Buran, a journalist with a career spanning more than 20 years in the media field after he joined Thomson Reuters, where he worked as director of Reuters Television. The Board of Directors of Sky News Arabia is chaired by Dr. Sultan Ahmed Al Jaber, CEO and Managing Director of Masdar (Abu Dhabi's leading renewable energy initiative) (ibid, 2011). "Since its launch, Sky News Arabia has been known for its strong virtual presence on almost all main social media platforms (Ayish and Mellor, 2015, p. 73). These mentioned were Arabic regional news channels, as many more are probably ranked lower in terms of spreading, funding, and viewership. The researcher chose to discuss the background of the most popular ones.

It might be worth addressing Arab newsrooms' investments in AR and VR compared to Western newsrooms. It is important to note that the landscape of media technology adoption can vary significantly across different countries and organizations within both Arab and Western contexts. However, there is no strong evidence to suggest that Arab newsrooms have more money to invest in AR and VR compared to their Western counterparts. Many Western media organizations, particularly large ones, have been at the forefront of experimenting with and implementing these technologies. However, some Arab media outlets, especially those backed by wealthy Gulf states, have made significant investments in new technologies. Many major Western news organizations have been experimenting with VR and AR for several years. For example, *The New York Times* launched its VR app in 2015 and has produced numerous VR stories since then. (Jones, 2017). The BBC has utilised this technology (Sirkkunen et al.,

2020). CNN has produced VR news content and launched a VR platform called CNNVR (CNN, 2017). These efforts often involve significant investments. Furthermore, there are examples of AR and VR adoption in Arab media. Some Gulf-based media organizations, backed by oil wealth, have invested in cutting-edge technologies. This study sample provides media outlets that invested in immersive technology, such as Al-Arabiya, Sky News Arabia, and Al-Sharq. However, it's important to note that adoption is not uniform across the Arab world. Wealthier Gulf states may have more resources to invest in these technologies than other Arab countries with more limited resources. Hence, while some Arab media outlets, particularly those in wealthy Gulf states, have made investments in AR and VR, there is no strong evidence to suggest they generally have more money to invest in these technologies compared to Western newsrooms. The adoption of AR and VR in journalism remains an evolving field in both regions, with varying levels of implementation based on numerous factors, including financial resources, market demands, and technological infrastructure.

2.4 Foreign Arabic-speaking satellite channels

Since their inception in the early 2000s, foreign Arabic-language satellite channels have played a significant role in reshaping the Arab media landscape (Hussien, 2018). The Middle East is considered one of the most volatile regions in the world, making it a focal point for the majority of global media outlets. The significance of events in the Middle East lies in the fact that their repercussions extend beyond the countries directly involved to impact the entire world. From the Gulf War to the Afghanistan War to the Al-Aqsa Intifada to the Iranian nuclear crisis, all these events have had far-reaching global impacts, extensively covered by media outlets worldwide through audiovisual means (Obaid, 2006). Therefore, it is not surprising that most international media organizations have established their news bureaus at these events' locations, deploying correspondents to provide comprehensive coverage (ibid, 2006). Yet, this was not deemed sufficient, prompting the governments of the United States, United Kingdom, and various European countries to launch Arabic-language news channels that broadcast news according to their respective policies and interests. After asserting itself on the global news map and launching multiple satellite channels, the Arab world has become less reliant on Western media for information about events in their surroundings (ibid, 2006). Witnessing this significant evolution in Arab media, Western countries were not content with solely broadcasting news in English; they began looking to disseminate news in Arabic as well, aiming to reach Arab audiences through the establishment of Arabic-language television

channels. Therefore, these satellite channels, in their coverage of Arab affairs, adopted a strategy aimed at legitimizing their intervention and influence, which governs their media policies and seeks to increase their impact among Arab audiences (Hussien, 2018). Hence, The establishment of Arabic-speaking channels by Western countries in the Middle East was driven by several strategic considerations. Western governments aimed to shape public opinion and perceptions among Arab audiences by providing news and information from a Western perspective (Seib, 2007). This was seen as a means to promote their policies, values, and interests in the region. Western countries perceived a need to counterbalance the dominance of existing Arab and pan-Arab media outlets, which often presented news and commentary from a different ideological standpoint (Sakr, 2001). By launching their own Arabic-language channels, Western governments sought to provide alternative viewpoints and perspectives. Western governments perceived a gap in the availability of reliable and credible news sources in Arabic that aligned with Western journalistic standards (Seib, 2007). Launching Arabic-language channels allowed them to fill this gap and provide news content that adhered to their own editorial principles (ibid, 2007). The irony is that Al-Jazeera network resorted to launching an English-language news channel to play a role opposite to that of foreign Arabic-language channels. Al-Jazeera wanted to address non-Arabic-speaking audiences and convey news from its perspective as an Arabic news platform (Obaid, 2006). Moreover, “the expansion of Arab satellite channels during the past decade has prompted several scholars to claim that this is a sign of the so-called “contra-flow of culture” from the Arab region to the rest of the world” (Mellor, 2011, p. 8). For example, Wessler & Adolphsen (2008) demonstrate how, during the 2003 Iraq conflict, major Western networks like BBC World Service, CNN, and Deutsche Welle depended on Arab satellite channels like Al Jazeera to stress the "Arab perspective" on the conflict. Hence, Europe, the UK, and the USA sought to attract Arab audiences through Arabic-speaking satellite channels due to the political and economic importance of the Arab region (Allaban, 2016). Moreover, Arabic-language channels are instrumental in shaping public perception, representing cultural ideals, and delivering both informative and entertaining content to Arabic-speaking audiences worldwide. They are pivotal in enriching media variety and addressing the linguistic and cultural preferences of Arab communities globally. The contrast between the prominence of foreign Arabic-speaking satellite channels and the limited equivalent in Latin America highlights the influence of media systems shaped by geopolitical and linguistic factors. Arabic-speaking satellite networks have become crucial in shaping public opinion and cultural representation for Arab audiences across the globe, driven by historical, political, and economic dynamics, including the need for a shared linguistic and

cultural space (Mellor et al., 2011). In contrast, Latin American media has largely been dominated by national broadcasters and a few regional players like CNN en Español, with limited foreign satellite penetration, reflecting the region's political fragmentation and the dominance of U.S. media influence (Herman and Chomsky, 2008). Moreover, the digital-only presence of BBC Mundo underscores the global digital shift, while also revealing the lack of sufficient infrastructure and market incentives for establishing powerful regional satellite channels akin to the Arab world's media model. This disparity reflects broader geopolitical asymmetries where resources, state policies, and regional cooperation shape the diversity and scope of media influence globally (Galtung and Ruge, 1965).

This section focuses on foreign broadcasters in the Arab region, specifically those that are among the most prominent Arabic-speaking channels. These channels were selected for several key reasons. First, they are integral parts of the Arab media landscape, shaping public discourse. Second, their prominence is enhanced by significant sponsorship from Western governments, such as those of the USA, Germany, and France, which not only influences their programming but also their role in the regional media environment. This sponsorship often provides these channels with the resources to adopt cutting-edge technologies and implement innovative practices. Third, these broadcasters are well-known and have a long-standing presence in the Arab world, with some being considered the oldest and most established in the region. Their longevity contributes to their influence on Arab journalism. Hence, the researcher identifies them as follows:

BBC Arabic

One of the most prominent Arabic-speaking news channels is BBC Arabic Television launched in 2008 as "a news channel broadcasting to the Middle East as part of the British Broadcasting Corporation, which is funded by the British Foreign Office" (Ayish and Mellor, 2015, p. 71). After the channel broadcasted an episode of a programme under the name Panorama eight years earlier in April of the year 1996, about human rights in Saudi Arabia, the company cancelled the contract. It cut off the broadcast, and the Saudi government also spoke at the time of what it called a failure to address sensitive issues in Saudi Arabia (Lahlali, 2011, p. 17). This BBC Arabic Channel has evolved into a 24-hour television service offering a variety of news and documentaries from Arab Media that span the globe and the region (Mellor, 2011). With an emphasis on educated middle-class viewers, this Arabic channel leverages the expertise of BBC World Television (ibid, 2011).

Al-Hurra

Among those Arabic-speaking news channels is Al-Hurra, which began broadcasting in 2004, launching a propaganda campaign that stated that "the channel's most important objectives are to present new horizons to viewers in the Middle East, and to create a greater degree of civilized communication in a media market dominated by excitement and suspense" (Allaban, 2016). Al-Hurra "is operated by the non-profit corporation Middle East Broadcasting Networks, Inc. (MBN), which, in turn, is financed by the US government's Broadcasting Board of Governors (BBG)" (Ayish and Mellor, 2015, p. 72). It is worth noting that the channel dedicated a special channel under the name Al-Hurra Iraq for the Iraqi audience, and also Al-Hurra Europe channel aims at addressing the Arabs who live in that region (Allaban, 2016). The channel reports on local and global happenings while also airing talk shows, current affairs magazines, and features on a range of topics, such as science and technology, sports, entertainment, fashion, and health and fitness (Mellor, 2011).

France 24

It is also a channel affiliated with the France International Group that used to broadcast its programmes in French and English which decided to address the Arab audience, through the Arabic-language version of the channel, where it "began broadcasting in 2007 for four hours a day and then extended the broadcasting to ten hours a day, reaching Broadcasting throughout the whole day in October 2010" (ibid, 2016). France 24 "stated mission is to "cover international current events from a French perspective and to convey French values throughout the world." (Ayish and Mellor, 2015, p. 74). As the channel states on its website, it produces its press materials based on "430 journalists of 35 different nationalities" from the French capital, Paris, according to a French vision of world events (France 24, 2010). Russia also had occupied a place on the map of Arabic-speaking channels.

Russia Today

In 2007, it launched the Russia Today channel (RT), a satellite channel of the Russian "TV-Novosti" corporation (Allaban, 2016). The channel presents itself, according to its website, as a 24-hour television news network that includes news bulletins, documentaries, talk shows, discussions, sports news, and cultural programmes (RT Arabic). It is noteworthy to mention that the channel was the first channel among both Arabic and Arabic-speaking channels to draw on digital tools, particularly on social media, to attract millions of Arab viewers. It aired the

first news bulletin using VR technologies making the presenter experience the news with a virtual battlefield. This bulletin began with a scene of the Israeli military planes firing missile shells at the Syrian capital, Damascus, after which the viewer could feel the flames flying in the studio, where the presenter was anchoring information about the war (RT Arabic, 2013).

Deutsche Welle

Equally, Germany sought to address the Arab public, years after the founding of the parent channel in 1953, and the increasing of its viewership by the Arab community in Germany (Kamal, 2022). The German Arabic-speaking channel, Deutsche Welle, which was established in 2005, is a subsidiary of German TV, providing news materials, analysis, and documentaries, in the fields of politics, economy, culture, sports, and science (Allaban, 2016). As it bears the slogan "To another vision of events in Germany and the Arab world", the channel seeks to introduce Germany and Europe at various levels from a German perspective (Deutsche Welle). Deutsche Welle is Germany's "visual, audible and readable voice to the outside world" an organization that defines itself on its website as seeking to be Germany's calling card to the outside world (Allaban, 2016).

2.5 Journalism & Technology

Scholars did not agree on such a single definition or specific role of journalism, but basically, they considered journalism as a way to provide people with information and news, "Certainly, journalism is as much about news as it is about its public" (Steel, 2009, p. 583). In other words, journalism would deliver different news such as economic issues, events and occasions, wars, conflicts and crises, significant projects, health topics, public affairs, human interests, and entertainment. Also, it has been thought about journalism as a medium of organizational purpose, "to maintain established positions of power within societies. In this way, these organizations could take advantage of journalism for their own interests (ibid, 2009, p. 583). Steel demonstrated that one of the significant definitions that discussed the main goal of journalism was reported by the Columbia University Graduate School of Journalism, illustrating that "the central purpose of journalism is to provide citizens with accurate and reliable information they need to function in a free society" (p. 584)Understanding the role and functions of journalism will lead to understanding the reasons behind media outlets and various press organisations' desire to utilize advanced and modern technologies, how to apply these

technologies in newsrooms, and how to achieve these functions and enhance the concept of journalism in the field of work and practice.

Researchers also found that journalists have to “Tell the reader what you know but also what you don’t know. When you make stories more transparent, you bring the reader into the process and invite his fair judgment.” (Kovach and Rosenstiel, 2002). Here are explicit signs of a range of news values, such as accuracy, reliability, and transparency, which reflect generally, on the importance of true news. These values could be practiced at a greater level in journalistic behaviour when applying the optimum exploitation of modern digital technology. For instance, achieving accuracy in the news, discussing its political and economic dimensions, and making it more understandable to the target audience, becomes more applicable if the news story is produced using graphic techniques, which may determine the location of the event on the map and the characters involved in the story, providing related digital data or statistics, etc.

Al-Azazi (2016) indicated that news channels have gained a high viewership, compared to other specialized channels, due to the news content they provide on various current events, which created a state of competition between news channels and made them compete at the same time to integrate modern digital technologies in the TV news work environment. Indeed, with this new visual transformation, in the form of TV news journalism, the Internet has become a major focal point when talking about spreading news and interacting with the public, especially, since “most Arab broadcasters are now represented on the World Wide Web and some websites include interactive features such as online forums” (Ayish and Mellor, 2015, p. 26). After years of adopting the Internet as a network and a source of news, a parallel market was continuously getting ready to participate in the news industry as identified by “social media” platforms, such as Twitter, Facebook, Instagram, and many more. These applications or platforms have become very popular, taking a remarkable dimension in the Arab world after the political tensions that accompanied the Arab Spring. As mentioned before, journalists’ main role is about what and how to tell the public stories. As storytellers, they have been keeping pace with technological advances, social media platforms, and other digital tools in the world of news storytelling. Therefore, it has become necessary to try to understand how this integration between journalism and technology could affect the news environment and journalistic practices in newsrooms.

Since 2011, and the beginning of uprisings that have swept through the Arab region, scholars’ attention has focused on the impact of new and social media in democratizing the

region. There has been some attention has been given to how Arab professionals have been using the new technology. As Ayish & Mellor (2015) pointed out, few studies have looked at how pan-Arab newsrooms have integrated new and social media technologies in their daily reporting, and whether such technology impacts traditional news values and journalistic practices. Regarding the relationship between technology and journalism in the Arab world, it is worth mentioning the earlier most prominent news channels in the Arab region: Al Jazeera satellite channel, MBC Group, represented by both Al Arabiya and Al Hadath news channels, and Sky News Arabia. These channels, which reflect the political agenda of Doha, Riyadh, and Abu Dhabi, respectively, have been able to produce their news content according to a modern and advanced digital vision. These news channels are known for their regional and international outlook and profile and the fact that they are well-resourced and, hence, can afford to implement new technologies compared to other newsrooms.

An important indication of the role of technology in Arab newsrooms is the desire of these channels to relaunch with completely new identities, in which they relied on integrating technology with news content. In 2016, Al-Jazeera launched its new identity with a comprehensive technical and technical change, coinciding with the channel's celebration of the two-decade anniversary of its launch. Al Jazeera's relaunch was from its new building, which includes "modern studios and a newsroom equipped with the latest technologies used in the field of television work" (Al Jazeera, 2016). Al Jazeera designed its new studios "to keep pace with the rapid development in television broadcasting technologies, and to give viewers an unprecedented visual experience on Arab screens" (ibid, 2016). It has also introduced advanced technologies, such as "3D augmented reality technology that allows the broadcaster to interact with live broadcasts, television lighting systems, and advanced self-guided imaging cameras" (ibid, 2016). The channel's newsroom was equipped with the latest TV content management software as well. As for Sky News Arabia, in 2019, it revealed "the largest process of change, renewal, and development since its launch in 2012," through the use of the latest digital technologies and television broadcasting, and "creating the latest newsroom in the Middle East and North Africa, through investment in the latest video broadcasting technology with new news studios based on virtual reality (VR) and augmented reality (AR) technologies" which interact with presenters and guests putting them in a virtual world to bring the viewer closer to the story and the event (AL-Bayan, 2019). In 2020, Al Arabiya launched its "new identity through modern studios to keep pace with the innovations of the global media industry," by integrating technology with its media content, aiming at providing value-added media content

to Arab viewers all over the world (AL-Sharq AL-Awsat, 2020). It has used advanced self-guided cameras and introduced augmented reality technologies during its most prominent political programmes during prime time. For its sister channel Al-Hadath, it has been concerned with improving the quality of the television image in a line and is keen to display the same virtual content as Al-Arabiya.

These newsrooms have benefited from digital technology and made their news content spread across various social platforms to reach the audience with sound, image, and short written news stories, which are suitable for the era of fast readers, or the conditions of the audience who depends heavily on visual material. According to Ayish and Mellor (2015) "Many pan-Arab newsrooms have embraced social media in their daily practices for different purposes, and chief among these is the use of social media for news gathering and for interacting with audiences" (p. 135). In terms of programmatic and news content, Al-Jazeera, Al-Arabiya, and Sky News Arabia have created news programmes where there is heavy social media content based on what is trending on social platforms. Saeed and Ayyash's study confirms that "satellite channels today include news bulletins in their programme plan that rely entirely on news published on the pages of digital media activists, additionally, they produce specialized TV programmes regarding this new type of digital media" (2020, p. 831). Examples of this idea are many, such as Nashretcom on Al Jazeera, Tafaolcom on Al Arabiya, and On Stream and Manassat on Sky News Arabia. Hence, it is greatly noticed that these channels are aware of the importance of integrating social media platforms in their daily practice, and to let social technology as a part of the news industry. This has been assured by Ayish and Mellor explaining that "All ten pan-Arab media outlets have developed their own iOS or Android-based applications to help users gain faster and more convenient access to their online content" (2015, p. 74). Since Al-Jazeera, Al-Arabiya, and Sky News Arabia are part of this vast media space, and due to the huge budgets, they allocate for news production, there are devoted specialized social media departments that publish the content of these channels on their platforms and online social pages, including Twitter, Facebook, Instagram, and others.

Diversity and technology go hand in hand in the world of media. For instance, mobile journalism paved the way for a new approach to telling and covering news and contributed to the presence of citizen journalists who became for a lot of times the main source of news, preceded professional journalists and television network reporters in documenting and recording through a mobile lens (cited in Jones, 2020a, pp. 42–44). Therefore, Gynnild et al.

(2020) indicated that immersive journalism could relate “closely to the mobile expansion in a global society” (p. 2). For example, 360-degree video is one of the immersive forms that has been used to tell immersive stories, as mobile phones were the fertile environment and the perfect place for applying this specific use. “2015 saw a rise in the number of mobile apps driven to supporting 360-degree immersive films” (p. 173). These channels have followed this trend, with the emergence of citizen journalism in particular and with people turning to social networking sites as sources of news. Hence, technology has always accompanied work and media practice. Bowman and Willis refer to citizen journalism or “participatory journalism” as the “act of a citizen, or group of citizens, playing an active role in the process of collecting, reporting, analysing and disseminating news and information” (2003, p. 9). They also indicated that this citizen journalism is “a bottom-up, emergent phenomenon in which there is little or no editorial oversight or formal journalistic workflow dictating the decisions of staff. Instead, it is the result of many simultaneous, distributed conversations that either blossom or quickly atrophy in the Web’s social network” (ibid, 2003, p. 9). Citizen journalism has gained prominence due to advancements in digital technology and the rise of social media platforms, enabling individuals to bypass traditional media gatekeepers and share news and information directly with a global audience. It has been instrumental in covering local events, crises, and social movements, often providing perspectives and insights that traditional media may overlook or ignore. In academic and journalistic discourse, citizen journalism is recognized for its potential to democratize the flow of information, foster transparency, and amplify diverse voices within public discourse (ibid, 2003). However, it also raises questions about accuracy, credibility, and the ethical responsibilities of citizen journalists in the digital age.

The technological development that existed in immersive experiences in the field of gaming imposed itself on the news industry with virtual reality (VR), augmented reality (AR), and 360-degree video technologies. For example, Al-Arabiya and Sky News Arabia have utilised these technologies to produce live and recorded news stories, in which they dealt with the US elections between candidates Donald Trump and Joe Biden, as they provided interactive content that was more attractive than only graphics. Al Jazeera's Innovation and Development department has also produced a range of news stories using these technologies. Elia Gharbeya, a producer in the department, said during an interview that aired in April 2019 on Al Jazeera, “With the flow of information and the acceleration of events, the focus on details and emotions became important, as journalists might miss them during normal coverages. Therefore, virtual contents were designed by a diverse crew of independent journalists” (Elia’s interview on

Aljazeera's Nashratokom about Contrast, 2019). One of these virtual journalistic experiences is the project entitled Living in the Unknown, which discussed the life of the Uyghurs in the diaspora. Hussien (2015) discussed the issue of technology in journalism and the changes or effects it may bring to journalistic practice. She mentioned several astonishing technologies that have recently invaded the field, starting with the robotic editor provided by the newsrooms of the Associated Press and Washington Post, in addition to drones that enhanced the field with professional images, ending with presenting news stories, especially humanitarian issues and crises, through VR technologies. She wrote this article in 2015, a few days after *the New York Times* released its virtual story *The Displaced*, where "the newspaper took its first step in the world of "virtual reality" and provided a new and innovative way to tell news stories benefiting from an application and a cardboard box dedicated to watching videos". She indicated that this creates an ability for the audience to "dig deeper into following the event" using their smartphones to watch the video as if they were part of the action. Hussien explained that the New York Times' experience was the first virtual experience in the world of traditional journalism, as ABC had previously produced a humanitarian story related to the impact of the war in Syria using a 360-degree technology presented by the channel's correspondent, Alexander Maracot.

2.6 Conclusion

This chapter discusses the circumstances surrounding the emergence of Arab news channels, especially Al-Jazeera and Al-Arabiya, which were able to draw millions of viewers worldwide thanks to their human resources and financial backing, staying abreast of developments and creative turns of events, and taking into account the deficiency of the Arab media landscape at the time of regional competitors and players. The most well-known Arabic-speaking news networks have also been examined; these channels generate their journalism in accordance with the political objectives of the nations that fund, promote, and sponsor it. Though there are other news channels, the ones listed above are the most well-liked because of their large audience, human frameworks made up of experts and columnists, advanced technology, and social media platforms that keep up with contemporary broadcasting.

Despite the proliferation of pan-Arab satellite channels, as explained above, scholars have argued that these outlets, while pushing competition among journalists, have faced several regulatory and political restrictions. Arab regimes often see the media as a two-edged sword: on the one hand, the media may shape public opinion, but it can also pose a threat to the

ideological underpinnings of these regimes (Mellor, 2011, p. 17). Hence, governments often tightly control media regulation to manage public discourse and maintain political stability. This regulatory environment poses substantial challenges for pan-Arab satellite channels seeking to operate independently and provide alternative perspectives to state-sanctioned narratives. It is "stated across the Arab world that you may broadcast an indecent kissing scene on television but may not even contemplate making a note of criticism of the political leadership"(Ayish, 2002). It is considered for "government censors, political transgressions seem to be far more sensitive than cultural violations" (ibid, 2002). Despite these challenges, pan-Arab satellite channels have adopted various strategies to navigate political restrictions and continue operating in the region (Sakr, 2001). One common approach involves establishing multiple broadcasting hubs in different countries to mitigate the risk of a complete shutdown in any single jurisdiction (ibid, 2001). Another strategy involves forming partnerships with local media outlets and journalists to enhance access to news sources and protect against government interference (ibid, 2001). By collaborating with regional correspondents and freelancers, satellite channels can circumvent censorship and provide on-the-ground coverage of events that might otherwise go unreported (ibid, 2001). By providing platforms for diverse viewpoints and marginalized voices, satellite channels contribute to a more pluralistic media environment and empower citizens to access alternative sources of information (Seib, 2007). This role is particularly vital in authoritarian contexts where independent journalism is often suppressed or co-opted by state-controlled media outlets (ibid, 2007). The proliferation of pan-Arab satellite channels has introduced new dynamics to the media landscape of the Arab world, offering alternative perspectives and challenging traditional modes of information control. However, the political restrictions governments impose pose significant challenges to press freedom and journalistic independence.

Since the spread of satellites, as Al Khalifa (2003) discussed in his article, satellite TV channels have occupied the forefront of mass communication because of what distinguishes them from other means of attractive image, sound, and effects, in addition to transmitting the event at the moment it occurred. He pointed out that despite the Arab world receiving news and information from foreign and Western channels, such as BBC and CNN, a noticed effort by many distinguished Arab media professionals led to the establishment of a solid base for media work, as evidenced by the fact that the Western world also has begun to receive news and information came from Arab spaces. This is, according to AL Khalifa, a testimony of success at the forefront of those Arab channels, which have become comparable to the

international ones. He also clarified that what distinguishes them is addressing the Arab viewers and their minds in the first place. However, how was the birth of pan-Arab media, especially, the specialized Arab news channels? Saleem (2017 , p. 69) indicated that Arab media faced many restrictions that hindered it from carrying out its role in monitoring state institutions freely, transparently, and responsibly towards society, considering these are either cultural or social restrictions that stem from the nature of the political and social system prevailing in the country or legal restrictions that have been established to control the media. For many years, according to Saleem, the Arab media space witnessed absolute control by Arab regimes and governments, which tightened their grip on all that is written or broadcasted in news bulletins or political programmes, so they directed them to ensure the regime stability and continuity and keep all the press, television and radio not exceeding the framework of the political approach. He clarified that the Arab media has experienced years of bias towards one party and propaganda directed at serving the Arab regimes and their governments, but during this governmental control, a new phenomenon began to emerge, namely the phenomenon of Arab satellite channels. On the Arab level, Aboud (2014) mentioned that those Satellite news channels have high viewership rates. He explained that it became evident that they are considered significant mass communication platforms due to their capability to transmit information to the public and provide them with a referential frame for what is happening in the outside world, which leads to strengthening the individual's relationship with various events, and connection to the community (ibid, 2014, p. 408).

The following chapter is dedicated to a comprehensive exploration of immersive technology, beginning with an in-depth examination of its definition and conceptual framework. Immersive technology encompasses a range of digital tools and techniques that enable users to engage with virtual and augmented environments in a deeply interactive and sensory manner. Furthermore, the chapter delves into how media outlets in the West are leveraging immersive technology to innovate their journalistic practices. It sheds light on the gap in the utilisation of such technologies in the Arab media landscape. Moreover, the chapter analyses critically the opportunities and challenges that media outlets encounter in integrating immersive technology into their journalistic workflows.

Chapter 3: Literature Review

Immersive Journalism: Definition, Opportunities, Challenges, and Scholarly Debate

3.1 Introduction

This chapter explores the expansive domain of immersive technology, aiming to offer a thorough grasp of its definition, wide-ranging applications, and profound influence on journalistic practices within media organizations. Immersive technology encompasses diverse forms, including virtual reality (VR), augmented reality (AR), and mixed reality (MR), each offering distinct avenues to captivate audiences and elevate storytelling. By examining their utilization across various media channels, from immersive reporting to interactive documentaries, this discussion underscores the potential they hold for crafting more engaging narratives. It also addresses the hurdles journalists face in integrating these innovative tools effectively, balancing the promise of enriched storytelling with the practical challenges of implementation. The chapter critically analyses the ethical dilemmas, technical limitations, and evolving norms that influence the incorporation of immersive technology into modern journalism, laying the groundwork for future innovations in the field. It delves into how these technologies have been implemented within newsrooms and media outlets, scrutinizing the ethical implications of their usage. Additionally, the chapter explores the motivations driving news organizations to adopt immersive technologies, examining both the opportunities they offer for enhancing storytelling and audience engagement, as well as the challenges they pose in terms of technical feasibility and ethical standards. By addressing these issues, the chapter seeks to provide insights into the evolving landscape of journalism amidst technological advancements, aiming to navigate the complexities and potentials of immersive technologies in shaping the future of news reporting. Immersive technologies like virtual reality (VR) and augmented reality (AR) have revolutionized conventional news consumption by providing audiences with interactive, immersive experiences that dissolve the boundaries between observer and participant. In Western literature, there has been significant exploration of immersive journalism. The final section of this chapter will review a selection of Arabic-language studies that examine the emerging field of immersive journalism. Arabic studies often emphasize content over the perspectives of journalists/producers or shifts in news culture within Arab newsrooms. This review aims to highlight how immersive storytelling is evolving within the Arabic media landscape, shedding light on unique approaches and challenges specific to this region. Therefore, this literature review focuses on immersive technologies that

enable audiences to actively engage with news stories. It will also explore how numerous news agencies have integrated these new technologies into their content presentation. This integration has empowered newsrooms to utilize advanced visual media technologies effectively, enhancing their ability to captivate and involve their audiences.

3.2 What is immersive journalism?

> *"How can immersive technologies be applied to improve meaningful reporting and investigate storytelling in journalism? How can skills and knowledge of virtual reality empower news professionals? And how can journalism codes of ethics help shape the new platforms, shape a future in which journalism continues to play an important role in society?"*

These are some questions that scholars (Gynnild et al., 2020, p. 1) asked about a range of issues related to the practice of a new form of journalism, a form that is able to apply technology to the fullest extent so that the audience can know what is happening in the world as if they are participants in the news stories, not just readers of newspapers, neither viewers of TV news bulletins. This new modern form is immersive journalism, which is "a recent trend in the production of news that uses virtual reality (VR) to allow viewers to experience the incidents or situations depicted in news reports and documentary films" (Shin and Biocca, 2018, p. 2801). Hence, "this practice of using technology to create new virtual worlds has since been labelled "immersive journalism" as it has been hailed as one of the most significant advances in journalism in the recent decade (Goutier et al., 2021, p. 1648). Scholars have also defined immersive journalism as "an experiential approach that allows users to experience, and subsequently becomes immersed in, stories created not in the real world but in a virtual, augmented, or mixed reality" (Gynnild et al., 2020, p. 2). They have also indicated that this kind of journalism implies the use of technologies like virtual reality (VR), augmented reality (AR), and 360-degree video while mixing these various technologies together is called cross-reality (XR) (ibid, p. 2). This "combination of VR and journalism has led to the emergence of so-called 'immersive journalism'" (Godulla et al., 2021, p. 456). It is also explained that "the more a device captivates senses and blocks out stimuli from the physical world, the more it is considered immersive (Van Damme et al., 2019, p. 2056). These devices might include "VR applications and features, 360◦ videos, or animated 3D models" (Godulla et al., 2021, p. 458).

But how has immersive technology integrated into journalistic practice produced what today is called immersive journalism as a new form of a modern visual journalistic field? It is the content itself that plays a prominent role in immersive technology adoption. Significant technology companies focused on how to promote their new immersive technology and increase the number of users. According to Jones, these companies have recognized that VR technology is considered the main environment of the gaming market. However, this technology adoption requires new content aiming at reaching a new audience, as the games industry has largely occupied the VR market (2020b, p. 85). Therefore, in order "to generate content and to encourage adoption," tech companies entered the field of news by motivating journalistic institutions to produce immersive news stories (ibid, p. 85). As a result, some big tech companies supported the idea of VR stories. Vindenes and Gynnild (2020) explained that there have been significant trends among some major organizations or companies to support the production process of news stories using virtual reality technologies. They indicated that, most notably, Google News Lab supported projects to the value of approximately US$250,000 in 2017, aiming at getting story ideas that could work as an immersive news story (p. 28). Google and Samsung have financed and supported some media organizations, which contributes to the presence of VR news stories, as they decided to enter – in addition to the gaming and computer industries- the world of journalism aiming at providing the user a new way of understanding news stories, because of the new opportunity of direct interaction (Jones, 2020a, p. 37). Many media outlets started producing immersive stories using the technology of VR; even traditional journalism, such as newspapers or news organisations, adopted this approach, using "360-degree video or animated 3D models in computer-generated scenes that can be experienced in VR" (Shin and Biocca, 2018, p. 2803).

Hence, at the news organizations level, the *New York Times* recorded a remarkable journalistic pioneering step by producing the titled mini-documentary The Departed, which could be watched on mobiles via the NYTVR app. (Gynnild et al., 2020, p. 3). BBC was also the first newsroom that produced a TV tech-show, Click, utilizing this technology (Sirkkunen et al., 2020, p. 13). One of the unique starting points is Project Syria, produced by Nonny de la Peña and her team. They applied computer-generated imagery (CGI), which is a computer programme that is used in games and news game design, to deliver their VR news story (Flatlandsmo and Gynnild, 2020). This project aimed at giving viewers the opportunity to experience two scenes virtually during the war in Syria. Flatlandsmo and Gynnild indicated that the project displayed a moment of a gigantic explosion, while the other scene shed light

on those refugees who came to Jordan and settled in the Zaatari camp. Regarding this genre of storytelling, VR journalists like Matilda Hanson from the Swedish newspaper (Dagens Nyheter) believe that 360-degree videos as one of the techniques in immersive journalism provide "ways for users to perceive the news from different angles than they have normally used, which can be the very asset of VR journalism" (Sirkkunen et al., 2020, p. 17). Immersive journalism harnesses technologies like virtual reality (VR), augmented reality (AR), and mixed reality (MR) to transport audiences into news stories in unprecedented ways. The following provides a descriptive approach to the audience`s experience:

1. **Active Participation:** Immersive journalism allows audiences to actively engage with news stories rather than passively consuming information (Slater and Sanchez-Vives, 2016). Technologies like VR enable users to don headsets and enter virtual environments where they can explore and interact with digital reconstructions of real-world scenes. This active participation contrasts sharply with traditional media, where audiences are typically limited to observing events from a distance (ibid, 2016).
2. **Sense of Presence and Immersion:** Virtual reality provides users with a heightened sense of presence within simulated environments (Kukkakorpi and Pantti, 2021). This means they feel as though they are physically present in the scene depicted, enhancing emotional engagement and empathy toward the stories being told (Tribusean, 2020). This immersive experience allows for a deeper connection to the content compared to reading or watching news reports on a flat screen.
3. **Multiple Perspectives:** Immersive technologies facilitate experiencing news stories from multiple perspectives (Uskali et al., 2020). Users can view events from different angles, navigate through environments, and engage with elements within the virtual space (de la Peña et al., 2010). This capability broadens their understanding of complex issues by offering diverse viewpoints and contextual details that may not be fully conveyed through traditional media formats.
4. **Augmented Reality Integration:** Augmented reality (AR) augments the real-world environment with digital overlays, blending digital content with the physical surroundings (Ikonen and Uskali, 2020). In journalistic contexts, AR can provide contextual information, interactive elements, and real-time updates directly within the user's field of vision (ibid, 2020) . This seamless integration enhances the immediacy

and relevance of news consumption, bridging the gap between digital content and physical reality.

In conclusion, unlike traditional media consumption, where audiences passively receive information, immersive journalism enables users to actively participate in and explore news events. Such technologies redefine audience experiences by making them active participants rather than passive observers, thereby transforming how news is consumed and understood in the digital age.

3.3 Immersive Journalism: Opportunities & Challenges

It might be claimed that a new ecosystem of immersive virtual reality technologies and experimentation has evolved since around 2012. (Baía Reis and Coelho, 2018, p. 1090). Applying immersive technology in the news industry has created significant opportunities for journalists and the storytelling process because higher immersion or presence will lead to viewers feeling the sense of being in another location when watching content and utilizing services (Shin and Biocca, 2018, p. 2801). This integration of technology into the storytelling world in the form of immersive journalism provides the potential to attract new audiences and allows much more interaction with the news story itself (Uskali et al., 2020, p. i). Hence, the power of immersive experience to establish a sense of emotional ties to people, events, and places is its competitive edge (ibid, p. 2). This genre of journalism is "more than just a technology; it is a blend of immersive technologies, interaction, and narrative options to emotionally engage the audience in a journalistic story" (Goutier et al., 2021, p. 1649). It is important to mention that a study conducted by Sirkkunen et al., (2020) concluded that news stories produced by the 360-degree video followed the same general traditions used in traditional journalism, but users or those who experienced immersive news stories have been given a new and innovative opportunity to interact with the story, live it up very closely, and allow more freedom to choose the scene he/she wants to focus on (2020, p. 22). Jones indicated that popular outlets decided to enter – in addition to the gaming and computer industries- the world of journalism, aiming at providing users with a new way of understanding news stories because of the new opportunity for direct interaction (Jones, 2020a, p. 37).

But there are real challenges to immersive journalism. Perhaps the most prominent of them are the cost, time, accessibility, and inclusivity among the communities and the commitment to the ethical codes and standards while practicing. Concerns were raised about the changes in

the newsrooms, in terms of to what extent journalists are ready and able to improve and deal with new technologies, additionally, the required cost and time to produce this type of news (Jones, 2017, p. 174).

Cost is a challenge. Robert Hernandez, one of the professionals who work in the field of journalism education, said that " the biggest bottleneck for adapting VR in newsrooms is the culture of fear, especially fear of the costs of producing VR" (Sirkkunen et al., 2020, p. 20). Those organisations that produce immersive news stories bear high costs regarding the salaries or wages paid to employees or the technical team who work in this field and the expensive technology and software that are being used in production. therefore, these organisations must choose those topics that deserve to be produced in the context of immersive journalism. However 360-degree interviews have been avoided by several notable VR journalists, but it might be a useful and affordable approach to broaden the scope of 360-degree video. (ibid, p. 19).

Time is also another challenge. However, Watson indicated that it may not take that long, as "BBC already was able to use 360-degree footage in reporting the Bataclan terror attack in Paris 2015," explaining that journalists were able to shoot, edit, and distribute the material on YouTube and Facebook within hours. (Sirkkunen et al., 2020, p. 19). However, the use of other technologies in the world of immersive journalism, such as virtual reality and augmented reality, may mean spending a long time to produce one journalistic story, given the drawing and visual embodiment that this story requires. However, in a year-and-a-half case study conducted on Euronews, which has integrated 360-degree video in its newsroom, adapting a low-cost approach and relying on inexpensive equipment, scholars tracked the production process, and they found that it took about three full days (Vindenes and Gynnild, 2020, pp. 28, 29). They highlighted that the decision whether to produce an immersive journalism story or not is based on 4 key elements: the possibility of implementation, how to implement, the existence of similar immersive stories, and the newsworthy. They also concluded that "Editors and journalists need time to develop formats and get a feel for the topics that are more suited for the medium than others" (ibid, p. 35). Additionally, the most significant impediment to widespread immersive news transmission remains the time-consuming nature of 360-degree productions. (ibid, p. 34). However, speaking of the immersive devices, not the whole process of immersive production, they are becoming inexpensive and could save time which, according

to Hardee (2016), enhances their adoption into the communications industry (Godulla et al., 2021, p. 458).

Regarding the global context, Jones (2020a) illustrates another challenge that is since the 1960s, cumulative discussions have always been about integrating VR technology into other fields, such as education, training, and the journalistic domain. It is completely understood that technology is desired for the efficiency it could offer, but how about the availability and accessibility among the communities all over the world? The answer indicates that there is a significant variation in internet distribution and internet speed worldwide, which creates limitations on the technology's accessibility in regains such as Central Africa and Southern Asia. In other words, Jones indicated that "there is an increase in the adoption of digital journalism, but the divide will continue to exist when countries cannot freely access the technology" (2020a, p. 39). In this sense, as most of the news stories produced using VR technology are related to the issues in developing countries, a noted global concern existed, because those stories would be displayed from a Western point of view, shedding light on a side, hiding the other one (Jones, 2020a). According to Jones, some global organizations have tended to train local journalists, providing them with immersive tools. As a result, "Electric South" a project that represents this trend in South Africa, and "Contrast VR" another example of enabling local immersive journalists at Al-Jazeera/ Qatar, would maintain both diversity and inclusivity. It is about breaking down technology boundaries so that the voices expressing tales are diverse and inclusive for real immersive story-telling (ibid, 2020a, p. 44).

But it is worth taking into account the implications that accompany immersive stories on the recipients who are immersed to a significant extent, to feel that they have moved from their real-world to another where they interact with the events of the story and its characters. In other words, scholars focussed on "examining how immersive storytelling calls for reassessing issues of journalism ethics and truthfulness, transparency, privacy, manipulation, and surveillance, and questioning what it means to cover reality when a story is told in virtual reality" (Uskali et al., 2020, p. i). This is a part of the scholars' efforts to understand the implications of integrating immersive journalism technologies into the world of news, regarding the "ability to create a sense of emotional connections to people, events and places" (ibid, p. 2). As previously mentioned, immersive journalism has created the opportunity for more interaction and engagement with news stories, but this could not be discussed away from the ethical considerations that regulate journalistic practices. In other words, Uskali and Ikonen, (2020)

indicated that there is a need for further studies that focus on understanding how to implement immersive journalism without exceeding journalistic standards, especially when it comes to the emotional impact on immersive journalism audiences (p. 56). They discussed that there are many claims for more regulations to ethically recognize utilizing immersive journalism, "journalism ethical standards offer a valuable basis for immersive journalism practices, but… there is indeed a need for some updates and fine-tuning" (ibid, p. 54). In general, these claims represent an ethical commitment to news values such as accountability, credibility, and transparency, which could be affected because of the audiences' empathy generated by immersive storytelling. Hence, VR, and what appears to be the major purpose of producing VR stories, is dependent on the technology's effective utility and usability, which affects the viewers' capacity to experience empathy while watching an immersive story (Godulla et al., 2021, p. 458).

3.4 The Western scholarly debate about immersive journalism

Researchers have been interested in studying immersive journalism as a new industry in the world of visual media, especially with the emergence of new technologies such as virtual reality (AR), which made the audience reach the highest levels of interaction with news stories. Thus, academics, researchers, and some journalists began conducting scientific research focused on various aspects of immersive journalism. It can be said that English studies discussed immersive journalism as it could be divided roughly into three categories which examine the content of immersive news as a new genre; the audience's engagement with immersive news; and the journalists' practices and views of the use of immersive technology in the Western newsrooms or news organizations in general. This section provides a clear indication of how these researchers approached each of these three main angles.

3.4.1 The content of immersive news as a new genre

News content was classified upon the form it is published into traditional journalism, based mainly on written and printed materials, and to other types of classifications, such as the audio journalism that spread with the invention of radio, or the visual journalism that emerged with the discovery of television (Mellor et al., 2011). Scholars are interested in studying the impact of immersive technology on journalism, focusing on the final product as immersive content. Kang et al. (2019) explained that "(VR) has received dramatic attention in both academia and the industry in the last decade" (p. 294). Therefore, researchers considered immersive

journalism as a new genre and began investigating and understanding all related issues to this new journalistic content. In other words, while traditional journalism aims to establish a link between readers and the news narrative, virtual reality journalism aims to bring people closer to a story than any traditional medium (Shin and Biocca, 2018, p. 2803). The professional beginning of immersive journalism relates to the year 2014 when Google launched the Cardboard headphones during a conference to pave the way for this genre of journalism (Jones, 2017). However, by 2015 *the New York Times* produced a 10-minute immersive news story, about three abandoned children under the title *The Displaced* using those headphones (ibid, 2017). For the sake of reaching a wider audience, providing them with a greater engagement than traditional journalism and a complete immersion, *The New York Times* launched an application NYTVR, so that subscribers of the newspaper can view the story (ibid, p. 173). Immersive journalism has become a new form of journalism, as global markets are competing with each other to produce immersive content. This result can be drawn from some studies that monitored journalistic production in major press institutions and media outlets. For instance, in a few projects conducted on nine journalistic institutions, Sirkkunen et al. (2020) concluded that *The New York Times* was the most active newsroom, creating 351 360-degree news pieces in 2016–18, followed by Euronews with 144 articles. (p. 14). It is worth mentioning that the study also included CNN, USA Today, the BBC, The Wall Street Journal, The Guardian, El País, and Dagens Nyheter. It is worth mentioning that the slower adoption of immersive technology in journalistic practice in some parts of the globe such as Latin America can largely be attributed to material conditions, including economic limitations, infrastructure challenges, and access disparities. While immersive journalism is advancing rapidly in wealthier regions, still there are significant barriers, such as high hardware costs, limited internet connectivity, and the lack of specialized training for users and developers.

Regarding immersive journalism content, researchers pointed out some details about this immersive content and the way it is presented. They observed that there are four genres used in news storytelling; the first one is (360-degree live) based on live footage just like live TV reports, while the second genre called (360-degree news) which allows users to visit certain places, such as museums (Sirkkunen et al., 2020). They indicate that the third genre is (360-degree documentary) which comes “close to extensive 2D documentaries regarding the amount of work and money spent on production” (ibid, 2020, p. 14), while the last one called (360-degree fiction) and produced by production houses which “focused on animated fiction, drama, or short fiction stories” (ibid, p. 14). On the other hand, Shin and Biocca (2018) clarified that

there are several types of immersive journalism; real images are used in certain immersive experiences, while computer-based animation with avatars is used in others (p. 2804). Remarkably, according to scholars, various ways were using these genres to narrate news stories, based on who will speak about the report, the journalist, the story sources, or the content itself depending on the reported natural sound (ibid, p. 15). On the other hand, in a year-and-a-half case study conducted by Vindenes and Gynnild on Euronews which has integrated 360-degree video in its newsroom, they noticed that the content related to culture, politics, and humanitarian issues represented 25%, 19%, 12% respectively. According to the verbal contextualization, it is observed that the immersive content has the same editorial structure as flat videos, but it has less textual information. It is worth mentioning that Euronews has produced over 170 videos using 360-degree until August/ 2019, focusing generally on content that either has visual elements or the location`s story is unreachable (pp. 30-32).

Some researchers intended to figure out the differences between each technology that is used to produce immersive content. Notably, some of them presented a comparison between virtual reality and 360-degree video discussing that VR journalism requires more effort and a longer time to produce immersive content than 360-degree journalism (Mabrook and Singer, 2019). They also illustrated that the technical work in the world of the VR industry requires complex technology and a specialized staff of technicians. Accordingly, they explained that news stories produced using virtual reality technology are more expensive. However, virtual reality journalism provides a greater opportunity for interaction for users and provides them with a sense of immersive experience at a high level, much more than the ability to view and review the place according to 360-degree technology. They also mentioned that currently, 360° production can be created with a little technological know-how and very affordable cameras, then uploaded on Facebook or YouTube, allowing pieces to become viral while drastically reducing delivery costs (p. 2096). Both researchers agreed that most of the content of immersive journalism produced to date is classified as 360-degree journalism rather than virtual reality journalism. Speaking of the way this immersive content is produced, scholars concluded that there are two main ways, either by incorporating “actual footage” such as the BBC piece about the Iraqi army’s bombing ISIS in Mosul, or by using “fictionalized narratives based on news events” which is an approach that The Guardian applied when it produced a story about The Kurdish child Aylan who drowned in the sea and was thrown by the waves on the shore (ibid, 2019, p. 2096).

3.4.2 The Audience's engagement with immersive news:

If the previous section focused on immersive content as a new genre in the world of journalism, this section examines other aspects focusing on exploring the audience's interaction with this new content. Scholars proposed that immersive experience has been associated with the idea of presence, which is ''the perceptual illusion of nonmediation'' (Sundar et al., 2017, p. 672). The sense of presence could be considered an important element in immersive stories. Hence, it is a user's or onlooker's subjective perception of being physically placed in a mediated and deceptive space (Pjesivac et al., 2021, p. 3). In this context, immersive virtual environments (IVEs), they claimed, allow users to interact with three-dimensional data in order to generate simulations of real-life scenarios (p. 1).

This idea was discussed in a study by the pioneer of immersive journalism Nonny de la Peña in 2010, before this type of journalism officially found its place in major news organizations. It is important to stand on some details related to their experiment Gone Gitmo. This experiment is "a virtual representation of Guantanamo Bay prison" Peña and her colleagues have designed a visual environment, enhanced with documentary recordings that enabled users to experience this game, which conveyed them to a level of immersion, as if they were detainees in Guantanamo Bay (de la Peña et al., 2010, p. 293). In this production, the user is represented by an avatar who is "hooded, shackled", and carried in a C-17 cargo jet to a cage at Camp X-Ray, abruptly wrenched from passive engagement to active participation (ibid, p. 293). Scholars identified three main factors in virtual experiences, namely: "being in the place", and "taking events as real" by simulating the conditions of the place with sound and image and using techniques that provide the experience of interaction, sensation, and integration, and last factor is the "transformation of the self, in terms of their body representation into a first-person participant in those events" (ibid, p. 298). Thus, their study explains that the basic concept of immersive journalism is to offer a digitally reproduced situation depicting the news story, as the user then, will generally be represented by a digital avatar who will view the world via the avatar's first-person perspective (p. 291).

Hence, immersive journalism may make the public more aware of events and news, especially those related to people's crises and suffering, because this kind of journalism provides users with the opportunity to experience and engage in the journalistic story. Sundar et al.(2017) raised a very important question that is "does this presence influence psychological outcomes of reading news, such as memory for story content, perceptions of credibility, and

empathy felt toward story characters?" (p. 672). They conducted their study based on the interaction of this study participants with two stories produced by *The New York Times* according to three models: VR with headphones, 360-degree video stories viewed on computer screens, and textual content published with images on the website. The study showed that "Participants who experienced the stories using VR and 360°-video outperformed those who read the same stories using text with pictures, not only on such presence-related outcomes as being-there, interaction, and realism, but also on perceived source credibility, story-sharing intention, and feelings of empathy" (p. 672). Researchers posited that what makes people trust immersive stories is that they create a vivid experience that allows viewers to feel more real compared to merely being exposed to texts, videos, and pictures; this, in turn, contributes to creating trust. Here, the study justifies these results, clarifying that the main factors of presence, which were mentioned according to three determinants, which are "being-there, interaction, and realism" (cited in de la Peña et al., 2010, p. 274) are available in the news story "depends on story's emotional intensity" (Sundar et al., 2017, p. 678). Moreover, Devon Dolan and Michael Parets discussed the interaction of immersive users based on 2 aspects: existence and influence (Jones, 2017). Existence indicates whether the user is a participant or an observant, while influence means whether this user is active and has control over the events of the story (ibid, p. 178). Here, Sanchez laws indicated such a unique point of view, saying that: (Cited in (2020, p. 223)

> *"One may imagine a future version of immersive journalism where the live streaming of news events in VR will enable us to connect and be involved in remote events with our full body, and hopefully will also allow us to act (perhaps with the help of an on-the-ground reporter, perhaps indirectly through other devices) to help victims and alleviate their suffering".*

Since talking about immersive journalism implies deep levels of interaction and engagement, some studies have discussed the impact of the physical presence of journalists or reporters in traditional journalism. Jones (2017) indicated that immersive technology has contributed to removing barriers between this genre of stories and the viewers, while the reporter may represent a barrier, keeping the user away from a deep interaction and immersion in the events of the story (p. 181). In this context, immersive experience makes users completely involved and immersed, away from any distraction with other things, unlike traditional journalism, where a study found that Americans, as an example, are multi-taskers,

so they may do side things while watching the news on TV (p. 181). One point could be added here, that immersive stories could be reporter-led as journalists would direct viewers towards the events, or character-led narratives that the main characters of the story lead users and direct them (ibid, p. 179). It is important to mention that those immersive stories produced by the 360-degree video followed the same general traditions used in traditional journalism, but the user has been given a new and innovative opportunity to interact with the story, and "live it up very close, and allow more freedom to choose the scene he/she wants to focus on (Sirkkunen et al., 2020, p. 22).

Engaging the audience with the immersive stories is not only limited to the level of immersion but other criteria can be taken into account. In this context, Godulla et al. conducted a study titled "An Immersive Journey through Flawed Technology: Users' Perceptions of VR in Journalism," in which they tried to answer the following question: "How do users evaluate modern VR apps produced by journalistic media outlets, with regards to the qualities of immersion, emotion, usability, and utility?" (2021, p. 459). Their paper has analysed "the user comments (n = 770) on 15 journalistic VR apps offered by media organizations, with the help of a qualitative-reductive content analysis" (p. 454). Regarding immersion and emotion, the participants experienced high levels of reactivity to these two criteria, feeling like they were part of the story and showing empathy for the selected stories. Perhaps this result agrees with many of the studies reviewed in this research, but two other criteria reflect a clear paradox. The participants showed a clear negative attitude towards some selected news stories. Their "comments regarding usability and utility were mostly of a negative, critical tone, and positive comments only referred to the absence of motion sickness" (p. 462). To clarify, they indicated flaws related to such visual and audio effects, the low quality of the cameras, the lack of translations or subtitles, others "with regard to technical problems and implementation", and the low level of control over experiencing the same story, as "the users' expectations of the VR experience do not seem to have been fulfilled" (p. 463).

Two unique angles were discussed regarding audience engagement with immersive stories. The first one was addressed by both Shin and Biocca (2018) who proposed that "it is not clear how people are actually experiencing these stories and their contexts" (p. 2800). They have focused on the audience not as a consumer using the latest technology in order to have an exciting experience but rather on the audience as a major influencer in the immersive industry as a whole. On their part, this means that the audience has cognitive perceptions and personal

expectations based on their personal experiences or subjective ideas, so cognition plays an important role in the audience's interaction with the immersive story. In their study "Exploring Immersive Experience in Journalism", Shin and Biocca relied on the so-called Expectation Confirmation Theory (ECT) in order to understand the users` experience and the way they interact with immersive stories, concluding that as cited in (2018, p. 2811):

> *"the viewer feels as though they are part of the action, is not directly given by HMD, VR goggles, stereoscopic video, or 360-degree camera… rather, it is reconstructed via user cognition and the stories of VR are reprocessed using user sense-making processes. Users actively create their own VR based on their understanding of the story, their personal traits, and the nature of the medium".*

According to this discussion, it is worth including Figure 3.1 which is the research model the researchers applied to the same study (2018, p. 2811), which demonstrates how the audience's "satisfaction with initial IJ usage is positively associated with the intention to adopt and continue use", how "Confirmation has a positive effect on" both embodiment and perceived empathy "when experiencing VR content", and finally, how both empathy and embodiment have "a positive effect on satisfaction from IJ" (ibid, 2018, p. 2808):

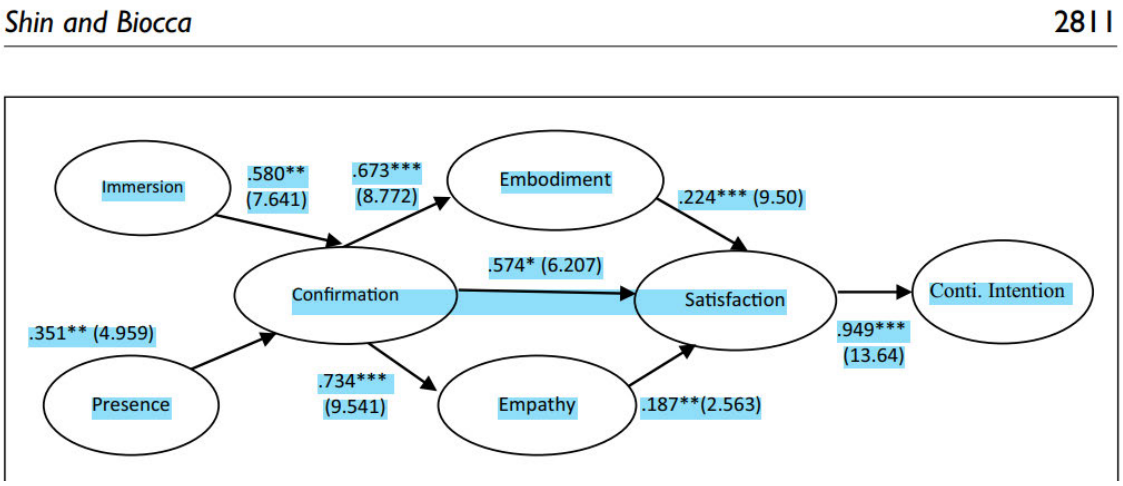


Figure 3.1: "Immersion" and "Presence" according to Shin and Biocca

Accordingly, the study emphasized three things related to the immersive journalism industry, which is based on the importance of focusing on the user experience of these technologies and understanding their perceptions, focusing on immersive journalistic content and not only on immersive technology, and focusing on how "to arouse users' emotion" as immersive journalism "adds another layer of immersion by arousing empathy and embodied cognition." (Shin and Biocca, 2018, p. 2817).

In conclusion. researchers are used to studying the impact of immersive technologies like VR on journalism, particularly focusing on emotional engagement, its applications, and suitable topics. Virtual Reality (VR) in journalism, often called immersive journalism, significantly impacts audience emotion and engagement. The immersive nature of VR allows audiences to experience news stories in a more visceral and immediate way, potentially leading to stronger emotional responses. VR experiences can increase empathy by allowing viewers to virtually walk in someone else's shoes. This can lead to a deeper understanding of complex issues and the human experiences behind news stories (de la Peña et al., 2010). The immersive nature of VR can elicit stronger emotional responses compared to traditional media formats. This heightened emotional engagement can lead to greater impact and memorability of news stories (Sundar et al., 2017). VR creates a sense of presence, which can make news events feel more real and immediate to the audience. This embodied experience can lead to stronger emotional reactions and potentially greater motivation to act on issues (Bailenson, 2018). Empathy is associated with certain topics that lend themselves particularly well to VR journalism. VR can provide a powerful way to communicate disasters' scale and human impact. For example, the UN's "Clouds Over Sidra" VR film about Syrian refugees has been noted for its emotional impact (Schutte and Stilinović, 2017). VR can be effective in illustrating environmental changes over time or showing the impacts of climate change that might be otherwise difficult to visualize (Aitamurto, 2019). VR reporting from conflict zones can provide audiences with a sense of the realities on the ground while keeping journalists at a safe distance (Kool, 2016). Moreover, VR can transport viewers to different cultural settings, fostering cross-cultural understanding (Pavlik, 2019).

Another new angle is presented in research about enhancing the interaction between the audience and immersive content by using the so-called “Directional Cues.” In this context, Pjesivac et al. (2021) wanted to explore the impact of this visual element, especially on “information recall, attitudes towards a news story, narrative transportation, presence, and message credibility” as they designed experiments by making the participants exposed to 3 conditions that are without directional cues, applying visual cues only, and applying both visual and verbal cues (p. 9). They concluded that immersive productions leave a higher level of effectiveness on the audience if journalists pay additional attention by using directional cues (p. 2). One of the functions of journalism is to tell people and inform them about what is going on, but in the immersive experience, while it provides viewers with the opportunity to interact deeply with the story, this immersion may cause distraction and prevent the user from

concentration on some important parts of the news, which means affecting his ability to recall some details. Scholars explained that “recent studies have shown that complex modalities content can also provoke feelings of higher cognitive burden, which could impact individuals’ ability to process information (ibid, p. 3). As a result, they indicated that “the most effective technique for directing viewers’ attention to one portion of a single shot is the use of both audio (verbal) and visual cues” (p. 6). This will increase the user's comprehension and ease the burden of perception and interpretation in what he or she views during his or her immersive experience (ibid, 2021). The study also concluded that the “presence of any directional cues in the news story significantly improved participants’ recall of statistics from the story but did not improve recall of verbal information. The presence of directional cues also impacted participants’ perceptions of message credibility”(p. 1). However, the study “did not impact their narrative transportation, attitudes towards the 360˚video news story or sense of presence” (p. 17).

3.4.3 Journalists’ practice & professionals’ views of the use of immersive technology:

During the previous two sections, immersive journalism has been discussed from two different perspectives, as it has become a new genre of journalism, accompanying modern technologies to produce a unique style, which also creates a different level of interaction with the audience. In this section, immersive journalism will be discussed from the journalistic practice and journalists' view. Mabrook and Singer (2019) indicated that journalists have lost part of their role as gatekeepers due to the public's ability to elicit information and news from multiple sources. However, VR technologies have reinforced this trend and greatly reduced the role of journalists as gatekeepers, as the public is able to control the immersive journalistic story. “In other words, users can affect how the story is told, what happens within it, and how it ends”(ibid, 2019, p. 2098).

Sirkkunen et al. (2020) tried in a study on a few projects conducted on nine journalistic institutions through some interviews with journalists and VR experts, to understand “the process of making VR journalism” (p. 17). Regarding VR storytelling principles, the findings indicated that VR journalists like Matilda Hanson from the Swedish newspaper (Dagens Nyheter) believe that 360-degree videos provide “ways for users to perceive the news from different angles than they have normally used, which can be the very asset of VR journalism” (ibid, p. 17).

However, as immersive journalism has created the opportunity for more interaction and engagement with news stories, this could not be discussed away from the ethical considerations that regulate journalistic practices. In other words, there is a need for more deep studies that focus on understanding how to implement immersive journalism without exceeding the journalistic standards and main news values, especially, when it comes to the emotional impact on audiences (Uskali and Ikonen, 2020, p. 56). It is noted that the audience's emotional engagement or "emotionality in journalism has been viewed as a necessary but uncomfortable truth" (Goutier et al., 2021, p. 1649). This point of view is based mainly on the idea of the role of journalism and how journalism could perform its role away from provoking people and motivating them to do a certain thing so that the journalistic work loses its dominant role. While immersive journalism creates greater emotional engagement with news stories, it also leads to a more deliberate framing of news, with a clear aim to evoke specific responses from the audience. This shift is especially significant because the emotional engagement encouraged by immersive technologies can lead to a more personalized and focused interpretation of events, potentially shaping public opinion in targeted ways (Uskali and Ikonen, 2020). The ethical dilemma arises from the fine line between informing the public and influencing their emotions and actions, which may skew the role of journalism as an objective informer. Immersive journalism, therefore, necessitates a careful balance: while it can enrich the audience's connection to the news, it must be carefully framed to avoid crossing the boundary between engagement and undue influence.

Therefore, scholars focused on "how journalists who produce immersive productions cope with the challenge of evoking emotional engagement, while simultaneously maintaining their journalistic standards" (ibid, p. 1649). The idea of creating empathy in an immersive journalistic story is essential and pivotal so that immersive work could be considered as truly immersive, when "simulating the character's "emotional reality" in the given situation evokes an emotional response and engages the user with the story" (Kukkakorpi and Pantti, 2021, p. 799).

While there has been a body of scientific research that attempted to study empathy in immersive journalism (Uskali and Ikonen, 2020) some studies have even tried to focus on the emotions generated by the journalists themselves while they practice their work. Among them, an essay "introduces the special issue entitled Journalism and Emotional Work. It argues the need for a context-sensitive understanding of emotional work in the journalism profession"

(Pantti and Wahl-Jorgensen, 2021, p. 1567). They said that a more extensive discussion regarding the emotional labour of journalists has found a much-needed springboard thanks to the increased focus on the emotional effects of crisis reporting. Simultaneously, research must be done on how news professionals interact with and control their emotions in a variety of media, journalistic specialties, professional capacities, and geopolitical settings (ibid, 2021). However, I have just indicated that emotions regarding working in the field of journalism have been addressed through different angles. As a result, Jones (2017) explained that, like any emerging invention or field, this type of journalism had raised concerns about the impact of the use of immersive technologies on journalistic behaviour and the industry itself, particularly "ethics, privacy and empathy" (p. 183). She added that this discussion focused on the extent of objectivity in telling this type of immersive stories, due to the journalist's personal experience in telling the story and his or her personal voice in dealing with its events. However, she indicated that "this new genre of storytelling needs a framework to ensure ethics and privacy codes are not compromised" (p. 171). Moreover, "the available literature shows that there is a growing integration of emotionality in journalism practice and that the traditional dichotomy in which objectivity and emotions are strictly separate has been challenged for a while now" (Goutier et al., 2021, p. 1650). As a result, Sanchez Laws addressed that, in some sense, the ethical difficulties that IJ faces are similar to those faced by prior technologies (2020, p. 224). Text, photography, radio, and video manipulation begin with framing and continue through editing, but, the greater involvement of the entire body in a VR experience, as well as the extent "to which this embodiment will affect our emotional response, our memory, and our decision-making, should make journalists even more aware of the need to address ethical concerns with the utmost care" (ibid, p. 224).

Here, Sanchez Laws is answering the question of his study, proposing that some immersive journalism can enhance empathy but there is a need to "go beyond this goal and into adopting a more forceful role in shaping the future of virtual reality" (ibid, p. 213). An important aspect that Sanchez discussed in this question as well, is that care must be taken by journalists who produce immersive stories, for the "safety and well-being" of the public who gets involved with immersive experiences, so that they must avoid the risks of entering into a state of "traumatic—experience" (ibid, p. 225). Hence, researchers indicated that they are aware of these concerns regarding the extent to which the immersive experience affects the credibility of the story produced by journalists, but they say that not using immersive journalism may cause the opposite as well, as they fully understand that "Immersive journalism does not aim

solely to present the facts, but rather the opportunity to experience the facts" (de la Peña et al., 2010, p. 299). Increasingly, among a group of scholars, Karin Wahl-Jorgenson and Pantti indicated that emotional narrative is really essential to journalism's ability to change the world, despite the concept of objectivity's continued existence (Wahl-Jorgensen and Pantti, 2021). Hence, since immersive experience enhances the audience's empathy with the story, the discussion was raised about the impact of this on objectivity while producing and telling news (Jones 2017). Here, at this point, Mabrook (2021)indicated through an exploratory study "conducted 27 semi-structured interviews with fact-based VR content creators" that the findings "showed the diverse understandings of objectivity among VR content creators and the growing acceptance of VR as a subjective experience" (p. 209). According to the researcher, in the case of immersive stories produced according to 360-degree technology, journalists do not control what the audience watches and who chooses the angle that they want to focus on, so this aspect varies every time the audience watches the same immersive story. However, Mabrook indicated that "Truth does not always lie in the middle" as "Balanced reporting and detached description do not necessarily convey the truth. Objectivity and truth are not the same thing because reality is "far more complex than a clear" dualism between facts and values" (2021, p. 220).

The phrase "empathic media," coined by McStay, relates emotions to virtual reality technology and addresses the concern that "users' emotions could be machine-readable, and this data could be used for influence and surveillance (Mcstay, 2017). As there are many claims for more regulations to ethically recognize utilizing immersive journalism, "journalism ethical standards offer a valuable basis for immersive journalism practices, but… there is indeed a need for some updates and fine-tuning" (ibid, p. 54). In general, these claims represent an ethical commitment to news values such as accountability, credibility, transparency, "authenticity, truthfulness, verification, and privacy", which could be affected because of the audiences' empathy generated by the immersive journalism (ibid, p. 53). Three main points could be explained in this discussion (cited in Johnson, 2020, pp. 74, 79).The first one is about the possibility of manipulation. Being so connected to the deep details in the news story and becoming more empathetic could be considered as manipulation and a lack of credibility. On the other hand, Chris Milk explained in his 2015 TED talk that VR journalism is not "for the sake of empathy", but it's a way to influence by changing the users' minds (ibid, p. 74). He discussed that in his project "Clouds Over Sidra" about a Syrian girl who was displaced due to

the Syrian war to northern Jordan to live in Zaatari camp, which is a camp established by the Jordanian government:

“When you’re sitting there in her room, watching her, you’re not watching it through a television screen, you’re not watching it through a window; you’re sitting there with her. When you look down, you’re sitting on the same ground that she’s sitting on. And because of that, you feel her humanity in a deeper way. You empathize with her in a deeper way” (ibid, p. 74).

However, Johnson hypothesizes that VR technology facilitates immersion and deep engagement that will acquire users' emotions and could agitate them towards adopting a specific point of view, as credibility might be affected then. The second point he addressed is about the author's absence. being completely disappeared from the shooting scenes could also be considered as a lack of transparency. Therefore, “signs of authorship should be inserted into stories in such a way that participants are reminded of the constructed nature of the IJ story” (p. 79). The third point is related to privacy concerns, as Johnson explained that obtaining prior permission to film the story from the related characters does not mean that immersive journalism may not override privacy by a large number of details the user could watch and notice during his heavy engagement with the immersive story.

It is noted that the audience's emotional engagement or “emotionality in journalism has been viewed as a necessary but uncomfortable truth” (Goutier et al., 2021, p. 1649). This point of view is based mainly on the idea of the role of journalism and how it performs its role away from provoking people and motivating them to do a certain thing so that the journalistic work loses its dominant role. The use of technology, particularly immersive and interactive technologies, has indeed changed the landscape of journalism significantly. Traditionally, journalism has been seen as a watchdog of society, aiming to inform the public objectively and hold power accountable. However, the advent of digital and immersive technologies has introduced both opportunities and challenges to the practice of journalism. Regarding changes in the role and function of Journalism, immersive technology, as indicated, allows journalists to present news stories in more engaging and immersive ways. This can enhance audience interest and emotional engagement with the news content. For instance, VR can transport viewers into the midst of a news event, providing a deeper understanding of the situation's impact. On the flip side, the use of such technologies can also blur the line between journalism and entertainment. Immersive technologies have the potential to manipulate emotions more effectively than traditional media formats. This raises concerns about sensationalism, bias, and

the ethical implications of using technology to provoke specific emotional responses in audiences. While immersive technologies can make news more captivating, there is a risk of sacrificing accuracy and objectivity in pursuit of emotional impact. Journalistic integrity is crucial for maintaining public trust, and the use of technology should not compromise the fundamental principles of accuracy and fairness. Hence, there is a risk that immersive technologies could be used irresponsibly to manipulate audiences emotionally, potentially leading to misinformation or exploitation of sensitive issues. Moreover, the pursuit of emotional engagement might prioritize storytelling over factual reporting, potentially undermining the traditional role of journalism as an impartial observer. This could not be discussed away from accessibility issues, as not everyone has access to immersive technologies, which could exacerbate inequality in access to information. However, this technology allows for innovative forms of journalism that can reach new audiences and better communicate the urgency and impact of news events.

Peña`s "Syria project" got both Flatlandsmo and Gynnild`s attention (cited in, 2020, pp. 60, 69). The project gave viewers the opportunity to experience two scenes virtually during the war in Syria. It is mentioned that the project displayed a moment of a gigantic explosion, while the other shed light on those refugees who came to Jordan and settled in the Zaatari camp. Here, it should be noted how the place plays a significant role in letting the user be engaged and involved with the immersive story. A study "explored how a sense of place is demonstrated in VR journalism, as its role has previously been overlooked… Acknowledging the role and importance of spatial narrative in IJ is crucial since it affects how news is composed, experienced, and understood" (Kukkakorpi and Pantti, 2021, p. 799). However, back to Flatlandsmo and Gynnild`s study, which aimed to measure how this virtual story is committed to journalistic standards, news values, and ethical considerations, adopted the American Society of Professional Journalists (SPJ) law as a reference. The study concluded that "issues of journalistic accuracy are in constant flux. No standards are currently set, and codes of ethics are only partially helpful in practice." (2020, p. 69). Here, Ville Juutilainen, a journalist, highlighted that the writing style or the narration structure for VR news stories is different, but the journalistic code should be followed, as the way of writing for VR resembles writing game scripts more than journalism, but it is critical to adhere to journalistic standards (Sirkkunen et al., 2020, p. 21).

3.5 The Arabic scholarly debate about immersive journalism:

The studies that dealt with the integration of 360-degree technology in news stories were basically Western studies, so there is an almost complete absence of Arab studies that discussed this kind of virtual techniques and their integration into the industry of journalism (Elshereef, 2021 p. 10). A study by an Egyptian researcher, Laman Ahmad, indicated that there is little research specializing in exploring the horizons of virtual journalism, but it is required to carry out more empirical studies that stand on the factors and effects of using this type of journalism. The Sudanese researcher Mustafa Abbas Sadiq, who presented to the Arab Library a book on VR journalism entitled "Media and Virtual Reality," agreed with this discussion, indicating that scientific writings regarding this aspect are rare (Asem, 2018).

In his book, Sadiq discussed the concept of virtual reality, in addition to other related concepts such as augmented reality and hybrid or mixed reality, especially the beginning of this type of journalism and inspiring experiences, and the stages of its development, in addition to practical applications, monitoring examples of international press institutions that produced virtual press stories (Sadiq,2018). In one of the chapters of his book, Sadiq touched on presenting some experiences in teaching virtual reality applications in international universities, and American ones in particular (ibid, 2018). In this context, Al-Azza (2017) also pointed out the importance of specialized training courses about VR technologies for TV workers, as he urged them to benefit from the expertise of satellite channels such as MBC (the Saudi group that also owns Al-Arabiya and Al-Hadath news channels), Sky News Arabia, and Russia Today, as these mentioned channels have used various virtual reality technologies in their TV content. Moreover, a study recommended training courses in Egyptian media outlets to increase awareness of the importance of these techniques and their impact on journalistic content, as it also recommended paying attention to the dissemination of using digital content in the community of Egyptian newspaper readers and utilizing virtual news stories (Abdel Moati , 2020).

In another study (2016) titled "The use of virtual reality technologies in improving TV presentation facades," Taj Al-Sir and Seddiq focused on the uses of virtual reality techniques in the media in general, specifically, the ALSHOROG channel satellite and the Sudan TV. They concluded that there is a pressing need to keep pace with international developments in the use of virtual reality. they posited that such technologies are not well utilized in Sudan despite the availability of staff members who have the potential to undertake such endeavours.

However, it should be noted that the study focused on the virtual display interface of television without discussing immersive virtual technologies.

Regarding the immersive industry, Mohammed (2019) explained that the ability to attract the attention of viewers in what he called television journalism requires more effort in providing journalistic materials in an attractive format. He pointed out that virtual reality techniques have imposed themselves in the field of television reports and news and spread greatly, particularly in the coverage of disasters, wars, and humanitarian crises, allowing the public to interact with the news in the light of a new journalistic experience under the name of immersive journalism. Laman Ahmad presented two studies (2018 and 2019) related to the industry of immersive journalism. Ahmad identified the term immersive journalism as a "form of journalism that gives the viewer the experience of being in the centre of events, immersed in the news story as if he were a part of it, using a mixture of three-dimensional techniques that link between the virtual world and simulated reality" (2018, p. 352), and it could be called "a virtual reality profession" (2019, p. 238).

The technological development has contributed to the tendency of media outlets to integrate both virtual reality and augmented reality technologies into the news products, aiming at providing interactive content, especially that using these technologies become much available through their mobile devices, so they are no longer monopolized by media institutions and companies (Abdel Moati ,2020, p. 39). One of the important points mentioned in Abdel Moati's study is that one of the requirements that the virtual reality programmer or developer must meet is "to be a practitioner of journalistic work, familiar with the news, and in contact with the news field" (p. 92). This study also pointed out that the use of virtual and augmented reality technologies has contributed to making the content much better and made it more attractive as people become dependent on what they see more than what they read. It was stated in this study that among the obstacles facing the use of these technologies in the Egyptian press websites is "electronic illiteracy" since not all people are familiar with these modern technologies, and the Internet is not available to everyone, and some do not have Android devices that allow browsing the news according to Virtual Reality Technologies. Regarding the Egyptian websites, "Akhbar Al-Youm, which is the publication of Al-Akhbar newspaper, was "the first to use the virtual technologies at the level of the Middle East", while Al-Ahram and Al-Masry Al-Youm newspapers used these technologies later on (p. 97).

Hussein (2015) explained the move from using VR in the games industry to the journalism field, reviewing the experience of Nonny de la Peña, who produced a series of documentaries using promotional platforms as a way to provide the audience with the opportunity to immerse themselves in real events. Hussein has described Peña's VR stories "The Guantanamo Bay" game and "Syria Project," concluding that these events appeared to be a reality.

Additionally, a study recommended the importance of allocating qualified staff and a dedicated budget to integrate immersive technologies, specifically 360-degree video, in Arab newsrooms, following up on international media outlets and their successful experiences in this field, to benefit from their experiences in obtaining ideas for Arabic immersive stories (Elshereef, 2021, p. 80). In this regard, another study recommended conducting studies on how Egyptian news mobile applications can benefit from artificial intelligence techniques, especially augmented reality, and virtual reality, trying to benefit from successful global experiences like *The Wall Street Journal* and *The Washington Post* (Al-Husaini, 2021, p. 1596). In another study, an experimental material was adopted, which is a news story about the spread of the Ebola virus in Africa, which it was presented to the study sample in both immersive and traditional forms (Khattab,2020). The study found that the journalistic style that adopted the 360-degree technology makes the viewer more immersive and attractive, which is more reflected in his memory and awareness of the immersive news story rather than the traditional video news story (ibid, p. 1448). Also, the findings of another study conducted on an academic staff within the framework of the sample survey method, using a questionnaire form on a non-random sample (Abu Sennah, 2021) agreed with these findings.

3.6 Conclusion

New visual technologies such as (VR), (AR), and (MR) have become more widespread in the news industry during the last few years (Goutier et al., 2021, p. 1648). Nonny de la Peña, an American journalist, a documentary filmmaker, and "one of the most influential pioneers in virtual and augmented reality" according to her page on LinkedIn became in 2012 the first journalist who was able to produce the first news story using the immersive 360-degree video, which was "a story on a diabetic man collapsing while standing in line at a food bank in Los Angeles" (Gynnild et al., 2020, p. 3). As de la Peña is considered a godmother and a pioneer when talking about the integration of VR experience into the world of storytelling, the use of immersive journalism as a term "was coined" by de la Peña and her cholagogues 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" (de la Peña et al., 2010, p. 291). Virtual Reality technology has created this high level of interaction as VR is defined as "the use of computer technology to create the effect of an interactive three-dimensional world in which the objects have a sense of spatial presence" (Godulla et al., 2021, p. 454). When considering VR experience, some concepts such as immersion, presence, and embodiment should be kept in mind. Because of the high level of engagement and involvement that users witness during the immersive storytelling experience, the influence of VR technology on the audience is quite unique. However, it should be noted that the immersive experience in journalism is not new according to de la Peña, and VR producers or virtual-content journalists began integrating this technology into the environment trying to deliver new forms of storytelling aiming at providing the audience "with a truer sense of the reality" (Shin and Biocca, 2018, p. 2803). Additionally, In terms of credibility, and sense of presence, researchers indicated that news produced using virtual reality which was exposed to the users showed a greater level, because of the feeling imposed by the immersive experience (Kang et al., 2019; Van Damme et al., 2019) but it showed "lower focused attention, recognition, and cued recall of information" (Barreda-Ángeles et al., 2021, p. 154). Immersive technology has opened new and innovative horizons in journalism and made the public interact to a very large extent with virtual content, but it has also created a set of challenges related to the practice of the profession, many of which are classified as ethical challenges, which researchers were able to summarize, namely identified as: "image integrity; reconstruction of the news; sources and staging; the role of the journalist and/or recording team; and sensitive content" (Pérez-Seijo and López-García, 2019, p. 954).

In brief, scholars would consider immersive journalism a new genre since the content is not always applicable to be produced as immersive. Godulla et al. (2021) pointed out that some journalistic stories do not have the possibility of turning them into an immersive experience due to the nature of their content. They explained that those news stories "must be visually appealing and well arranged," not "complex, nuanced stories," indicating that "facts and statistics" stories "are rather less suitable. This bears challenges for journalistic practice, where journalists have to apply the media-content match" (Godulla et al., 2021, p. 458).

By comparing Western and Arab studies, it is noticeable that Western academia has dealt with the subject of immersive journalism more quantitatively and qualitatively, as it touched on aspects of theory and practice, and relied on immersive journalism stories mainly produced by foreign newsrooms, while Arab studies emphasized the need for more of these studies in

the Arab world whose news outlets have recently applied immersive technology in their newsrooms. Arabic studies tend to focus on the content, more than on the journalists/producers or the changing news culture inside Arab newsrooms. This research contributes to the emerging field of immersive journalism. The use of technology, particularly immersive technologies, impacts journalism's role and function. While it offers opportunities for deeper audience engagement and innovative storytelling, it also poses risks to journalistic ethics and objectivity. The key lies in using these technologies responsibly, ensuring that they enhance rather than undermine the core principles of journalism. Ultimately, the benefits can include a more informed and engaged public, but this must be balanced against the potential costs to journalistic integrity and societal trust.

Chapter 4: Theoretical Framework

4.1 Introduction:

This chapter illustrates the theoretical framework that provides “a particular perspective, or lens, through which to examine a topic” (Bezet, n.d.). A theoretical framework offers a structured approach to conceptualizing and investigating research problems, helping researchers to organize their thoughts, define variables, and develop hypotheses (Creswell, 1998). Moreover, it enhances conceptual clarity by providing definitions and explanations of key concepts, ensuring consistency and precision in the study (Crotty, 1998). It draws attention to the connections between certain theories and immersive reporting. The contribution to this discussion provides a better understanding of how adopting such technologies would impact the journalistic practice in pan-Arab newsrooms. Hence, the following explains the theoretical framework in a context that links between journalistic practice in Arab newsrooms, and immersive technology. In other words, this framework helps elucidate the changes occurring in Arab newsrooms as a result of the adoption of immersive technology, highlighting both the affordances and challenges of immersive utilisation. This research investigates the integration of immersive technology within Arab newsrooms, employing a theoretical framework to analyse its findings. Actor-Network Theory (ANT) is utilised to examine video data, focusing on the interrelationships and networks formed between technological artifacts, human actors, and their environments. ANT helps elucidate how immersive technologies are enacted and shape practices within newsroom settings. In contrast, Bourdieu's Field Theory is applied to analyse the interviews conducted with professionals, exploring how individuals within Pan-Arab newsrooms navigate and negotiate the complexities of integrating immersive technologies. By employing ANT and Bourdieu's Field Theory, the research aims to comprehensively address its research questions by examining the adoption of using immersive technology in journalistic practices within the Arab context.

4.2 Bourdieu’s Field Theory

“Interest in Bourdieu’s field theory has been steadily growing within the field of journalism studies” (Paul, 2024). This theory, known as the theory of fields, is adopted in this study. Drawing on Bourdieu's field theory provides a robust analytical framework for understanding the lifeworld of the respondents in the field of immersive journalism. By adopting Bourdieu's

insights into professional practice, I have utilized field theory as a mechanism to explore how professionals within Pan-Arab newsrooms navigate the complexities of integrating immersive technologies into their journalistic practices. Through interviews with 20 professionals, this approach allows for an examination of how these individuals perceive and negotiate the dynamics of their professional field, including the field itself, capitals, and habitus that shape their interactions with immersive technologies. Bourdieu's field theory, thus, serves not only as a theoretical lens but also as a methodological tool that illuminates the underlying structures and power dynamics influencing the adoption and utilization of immersive journalism within contemporary newsrooms. It is a sociological concept developed by French sociologist Pierre Bourdieu. It offers a framework for understanding social life through the analysis of social fields, which are structured spaces where individuals and groups compete for various forms of capital (Bourdieu, 1984). Bourdieu conceptualizes society as a complex network of interconnected fields, each characterized by its own set of rules, values, and power relations (ibid, 1984). Bourdieu's conceptualization of society as a complex network of fields suggests that social life is not monolithic but rather comprised of various spheres, such as education, politics, culture, and economics, each functioning as its own domain with its own unique characteristics (ibid, 1984). For example, within the field of education, individuals and institutions compete for academic recognition and credentials, while in the cultural field, artists and intellectuals vie for cultural capital and prestige. Hence, concerning journalism, this theory "offers a framework for studying journalism as a social field" (Mellor, 2007, p. 45). Bourdieu's field theory is crucial for comprehending the power dynamics, hierarchies, and practices within this journalistic field (ibid, 2007). Bourdieu's concept of the field provides a general sociological model that is particularly relevant to understanding journalism and journalist-source relations (Benson, 2006). The journalistic field, inspired by Bourdieu's field theory, sheds new light on media studies by providing a theoretical construction that illuminates issues within the media landscape (Baisnée and Nollet, 2019). The theoretical framework of Bourdieu's field theory is highly relevant to examining the use of immersive technology in Pan-Arab newsrooms, as it offers a lens to understand the power dynamics, social hierarchies, and practices within the media landscape. In this context, the "field" refers to the journalistic environment, where different agents—such as journalists, news organizations, and technology providers—compete for resources, influence, and legitimacy. The integration of immersive technology into Pan-Arab newsrooms can be analysed through Bourdieu's concept of capital, where news organizations may invest in technological infrastructure to gain symbolic, cultural, and economic capital, enhancing their competitive position within the media field. Bourdieu's

framework also highlights the relationships between journalists and their sources, particularly in how immersive storytelling might alter these dynamics by offering more interactive, emotionally engaging content, potentially shifting power relations and journalistic practices. The concept of the journalistic field also emphasizes the ongoing negotiation between tradition and innovation, making it a crucial theoretical tool to understand how Pan-Arab newsrooms are navigating the adoption of immersive technologies while maintaining journalistic standards and values. In sum, Bourdieu's field theory provides a comprehensive approach to studying the intersection of technology, power, and journalism in the context of the Pan-Arab media landscape. The key aspects (Benson, 2006; Baisnée and Nollet, 2019; Maares and Hanusch, 2022; Munnik, 2018) of Bourdieu's field theory relevant to journalism include:

Field: The social space where individuals and institutions interact and compete for resources and power. In journalism, this would be the journalistic field, characterized by its own rules, norms, and hierarchies.

Habitus: Refers to the internalized dispositions, skills, and ways of thinking that shape individuals' behaviors and perceptions within a field. In journalism, habitus influences how journalists approach their work and navigate the field.

Capital: Bourdieu identified different forms of capital (economic, cultural, social, symbolic) that individuals and organizations accumulate and deploy to gain an advantage within a field. In journalism, capital can manifest as expertise, reputation, access to sources, and technological resources.

These concepts are crucial in understanding the dynamics and power structures within the journalistic field, as well as how journalists navigate and interact within this space. In the context of this thesis, the field relates to pan-Arab newsrooms, as they compete to integrate the recent modern visual technologies such as immersive technology into their journalistic practice and always work on popularity, audience attention, and relevance. According to a study conducted by (Wu, 2023), The use of immersive technology in media has grown, sparking discussion on whether these tools can really change journalism. Wu's study examines possible impacts on the work experiences, skill sets, and guiding principles of journalists using Bourdieu's field theory and in-depth interviews with 12 developers from the most prestigious companies in the world that produce news content using these technologies. However, I (the researcher) intend to apply Bourdieu`s field theory as a tool to analyse the 20 interviews

conducted in my study. "Structure" and "agency" are two diametrically opposed ideas in a field that are interdependent and cannot exist apart (Wu et al., 2019). A crucial aspect of field theory is the "field's doxa", or the unwritten set of internal norms or standards that practitioners adhere to (such as news values in the journalism profession). This is where structure comes from. Conversely, the agency is closely linked to "habitus", a field theory dimension that is defined as the agents' past experiences and cumulative knowledge, even if it is influenced by the field's structure or doxa (Lowrey et al., 2019). The third important aspect of field theory, "capital," influences how agents act and behave in addition to doxa and habitus. According to Wang (2018) it is the "material and non-material asset that the given field possesses to distinguish itself from other fields in terms of its value and role" (p. 474). It also refers to the many kinds of acquired resources that enable agents to engage and succeed in the field (Wu, 2023). Capital "takes on multiple forms—it can be economic (e.g., financial assets), political (e.g., popularity), social (e.g., connections), or cultural capital (e.g., skills)" (ibid, 2023, p. 389). Therefore, according to Figure 1 below, this research relies on the three aspects mentioned above, which are Doxa, Habitus, and Capital, based on the analysis of the interviews using Bourdieu's field theory.

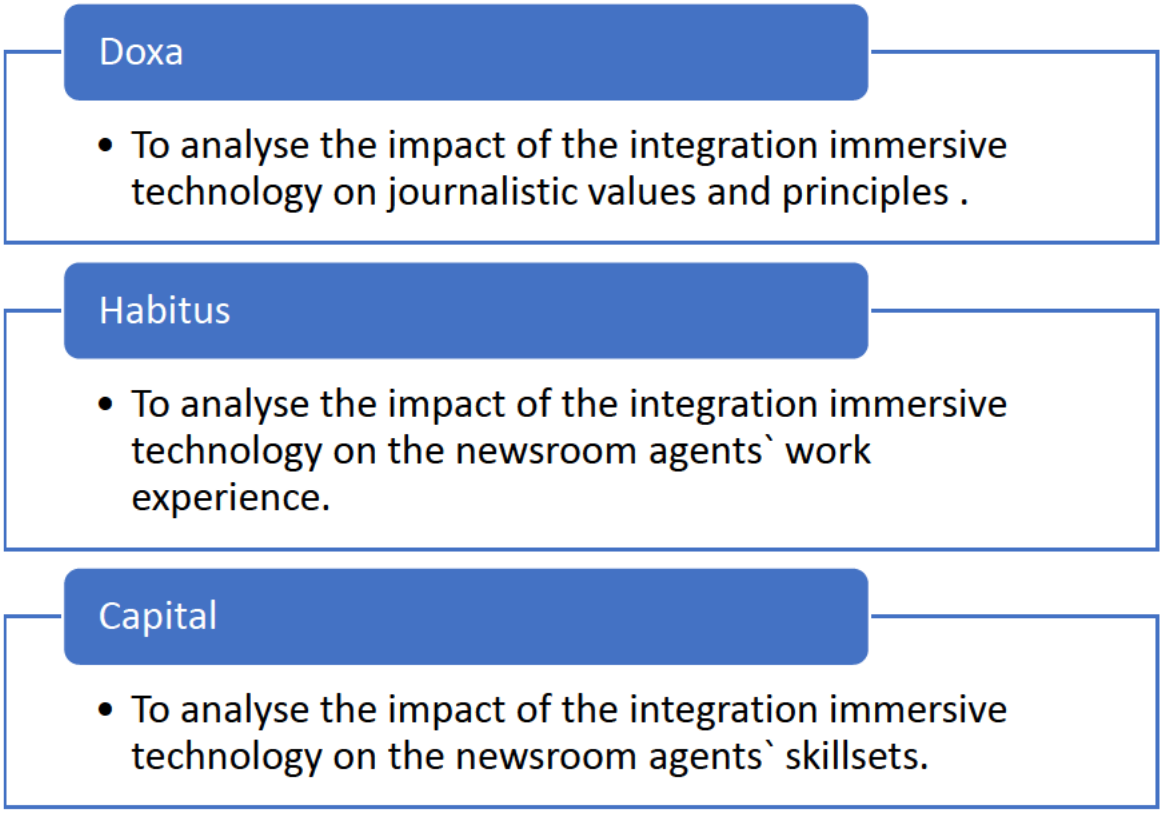


Figure 4-1: Using Doxa, Habitus, and Capital aspects in interview analysis

The concepts of "structure" and "agency" are intertwined when analysing the impact of immersive technology on journalism, as they represent both the institutional forces shaping practices and the individual choices of journalists within those structures. Using "doxa," or the set of unquestioned beliefs and norms, one can explore how the integration of immersive technologies challenges traditional journalistic values and principles, particularly around objectivity and emotional engagement. Immersive technologies introduce new ways to tell stories, potentially altering how journalists frame events and how audiences perceive reality. On the other hand, "habitus" can be applied to understand how newsroom agents, influenced by their backgrounds and experiences, adapt to these new technologies. Habitus reveals how the adoption of immersive tools affects their work routines, creativity, and sense of professional identity. Together, these concepts offer a comprehensive analysis of how immersive technologies reshape both the structures of journalism and the agency of the individuals working within it, ultimately transforming the practice of news production. As mentioned, the “field” according to Bourdieu, is a social space where individuals and institutions interact and compete for resources and power. The researcher considers “newsrooms” as the “field” of this study that is related to the journalistic environment (space), which is characterized by its own rules and norms. These newsrooms are Al-Arabiya, Sky News Arabia, and Al-Sharq. One important point that has to be explained is that this study attempts to shed light on the changes that have affected journalistic practice due to the integration of immersive technology. In other words, this technology can be considered what is called “new entrants”. New players (agents) can also contribute to the transformation or preservation of a domain (Wu, 2023). These newcomers, with more motivation and aptitude for change, usually reach this level when they have resources and links with established agents, while those with fewer of these are less likely to challenge the status quo (Russell, 2007, p. 289). However, a major effect can only happen when the entry of these new agents is helped by a secondary external factor, such as technological change (Benson, 1999). Field theory emphasizes the impact of a field transformation or preservation when a new influx occurs. According to Figure 4-1, the following delves into more explanations about how the main three concepts are used to analyse the data:

4.2.1 Doxa: Analysing Values and Principles

Doxa refers to the fundamental beliefs and principles that are taken for granted within a particular field (Bourdieu, 1977). In the context of immersive journalism, the integration of new technologies challenges and reshapes existing journalistic values and norms. Doxa allows us to analyse how the adoption of immersive technologies influences core journalistic principles such as credibility and truth-telling. For example, immersive storytelling techniques may prioritize audience engagement over traditional notions of impartiality, raising ethical considerations about manipulating viewer perceptions and immersive experiences. The analysis of Doxa in this study examines how the integration of immersive journalism impacts the values and principles guiding journalistic practices within Pan-Arab newsrooms. By applying Doxa, this research seeks to uncover the implicit rules and norms that govern the adoption and utilisation of immersive technologies in news production.

4.2.2 Habitus: Impact on Work Experience

Habitus refers to the deeply ingrained habits, dispositions, and cultural outlooks that shape individuals' behaviors and perceptions within a specific field (Bourdieu, 1977). In the context of immersive journalism, Habitus helps us understand how journalists and newsroom professionals adapt to and internalise the use of immersive technologies in their daily work practices. It encompasses the skills, routines, and professional identities developed through repeated interactions with these technologies. The analysis of Habitus in this study focuses on how the integration of immersive technologies influences the work experiences and professional identities of newsroom agents. It explores whether journalists develop new competencies in immersive storytelling, how they negotiate the demands of technological proficiency with traditional reporting practices, and how their professional roles evolve within a changing media landscape.

4.2.3 Capital: Analysing impact on skillsets

Capital, in Bourdieu's framework, encompasses the resources and assets—economic, cultural, social, and symbolic—that individuals and organizations possess and deploy to gain advantage within a specific field (Bourdieu, 2002). In the context of immersive journalism, Capital analysis focuses on how the adoption of immersive technologies enhances or reshapes

the skillsets and competencies of newsroom professionals. The analysis of Capital in this study investigates how the integration of immersive technologies affects the distribution and accumulation of various forms of capital among newsroom agents. It explores whether journalists and news organizations invest in technological infrastructure to capitalize on the potential benefits of immersive storytelling. In this context, "capitalize" refers to the act of strategically leveraging immersive technologies to gain advantages in the media industry. Specifically, it means that journalists and news organizations are investing in technological infrastructure with the goal of enhancing their storytelling capabilities, thereby increasing their competitive edge in the industry. By adopting immersive technologies like virtual reality or augmented reality, they aim to attract a larger audience, improve engagement, and ultimately secure more economic, social, or cultural capital. This could involve gaining more viewership and revenue, enhancing journalistic credibility and influence, or positioning themselves as leaders in innovative media practices. In essence, "capitalize" here implies making investments in immersive technologies to maximize the potential for growth, recognition, and influence within the media landscape. By examining Capital, this research seeks to uncover the strategic investments and resource allocations that shape the competitive dynamics and professional trajectories within contemporary newsrooms.

This research aims at the evaluation of the effects of immersive technology on journalism through the lens of this theory. In conclusion, Bourdieu's field theory provides a comprehensive and interdisciplinary framework for analysing the integration of immersive technologies within journalism, particularly within Pan-Arab newsrooms. By applying Doxa, Habitus, and Capital as analytical tools, this research illuminates the underlying structures and power dynamics that influence the adoption and utilization of immersive journalism. It explores how newsroom professionals perceive and navigate the complexities of integrating immersive technologies, offering insights into the evolving practices, values, and skillsets that shape contemporary journalism in the digital age. Bourdieu's field theory thus serves not only as a theoretical lens but also as a methodological tool that enriches our understanding of the transformative impact of technology on journalistic practices and professional identities.

4.3 Actor-Network Theory

To this day, journalists and the majority of those who study them adhere to a thoroughly contemporary conception of the profession, according to which clear analytical boundaries

divide the news from its creators and consumers, the press from the political sphere (Turner, 2005). However, the introduction of new media technologies has started to erode these limits in actual use (ibid, 2005). Because of its focus on socio-technical hybrids, ANT is a useful framework for studying how journalism has evolved in the digital age (ibid, 2005). Researchers (Bruno Latour, Michael Callon, and John Law), particularly in the field of the sociology of science and technology in the 1980s, created an approach that is Actor-Network Theory (ANT) (Crawford, 2020). This unique strategy seeks to reframe actors as anything, human or otherwise, that affects or disrupts the functioning of a technologically enabled social system (ibid). Practitioners have accepted and criticized ANT far into the 21st century, yet it still serves as a helpful research method (ibid). There has been some discussion about the dangers of technological determinism in the media, and ANT has been suggested as a means to avoid this. Some have pointed to ANT as a viable strategy for avoiding technological determinism while still considering the impact of technology on the evolution of newsroom culture and practice (Mabrook and Singer, 2019).

ANT sheds light on how things happen, particularly the nature of agency, and emerged from poststructuralist French discussions on the sociology of science and technology (Muniesa, 2015). ANT investigates a phenomenon of interest by isolating its elements and revealing their relationships (Latour, 2007). It emphasizes the need to see social groupings as actor networks or a net of interactions in which each entity's position is fluid and dependent on the actions of its peers (Schmitz Weiss and Domingo, 2010). Thus, ANT provides the freedom to focus on each player engaged in the development of immersive journalism, including the technology itself, as researchers who favour a shift toward “a socio-technical emphasis in the study of news production” have suggested (Mabrook and Singer, 2019, p. 2099)Therefore, it could be concluded that this theory concerns not only the human element but also objects referred to as "actors." Since the basic core of this theory is the idea of a divergent network, it includes social and technological elements that together form an integrated whole.

Accordingly, this research (as indicated in Chapter One) aims to gain insight into how immersive technologies are being integrated into pan-Arab newsrooms and understand how it presents journalists with a new set of opportunities and challenges. This requires delving into the impact of utilising these modern visual technologies on journalistic practice. Essentially, this research seeks to investigate the added value of applying immersive technologies and

examine the extent to which these tools enhance journalistic narratives and support news reporting. In ANT, there is a need to identify the whole actors (human and non-human) as:

1- Human: (journalists, editors, editors-in-chief, producers, general managers, video editors, VR designers).

2- Non-human: Visual aids that are integrated into news production, mainly immersive technologies such as (AR, VR, and MR) and news values.

This research provides an understanding of the relationships among both human and non-human actors as the following indicates:

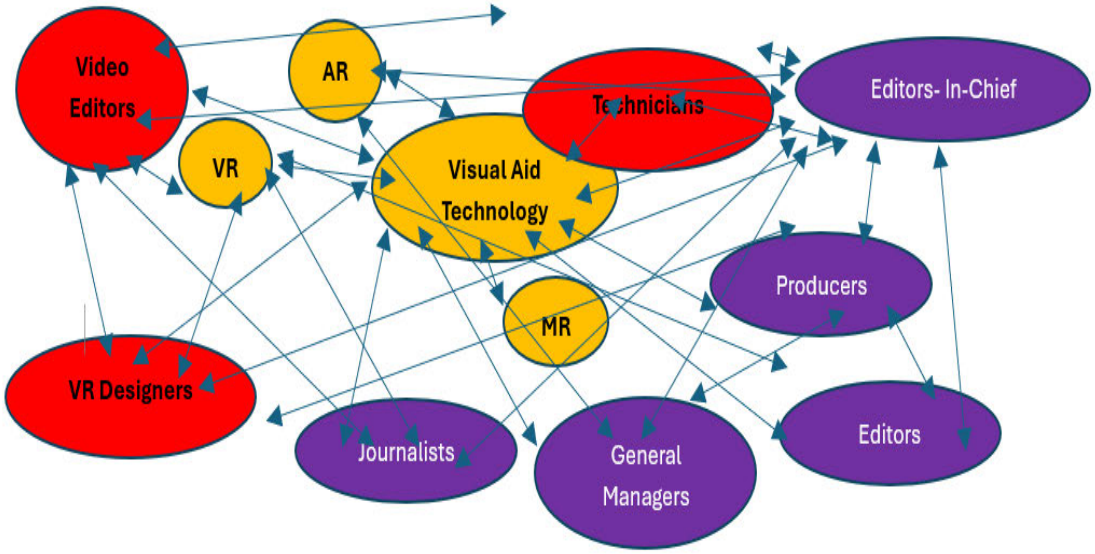


Figure 4.2: Human and Non-Human actors according to ANT

Figure 4-2 provides a mapping of the actor networks as an approach to analysing the data collected and coded, which will be discussed further in the following section. Humans have a variety of roles in the creation of immersive videos beyond that of journalists; they include, but are not limited to, those in the fields of technology, the arts, and marketing (Mabrook and Singer, 2019). ANT makes it easier to think critically about how they fit into the news cycle and how their presence influences journalists and users (ibid, 2019). Figure 4-2 visualizes the networks of actors to illustrate relationships between different actors, how non-human actors (technologies) facilitate or constrain interactions, and the influence of broader technical contexts on video content and journalistic practice. Moreover, this elaborates on how journalists use immersive technology in their journalistic practice to enhance storytelling.

Callon (1984) discussed the concept of “Translation” which refers to the process through which different actors’ interests are aligned and coordinated within a network. In the context of integrating modern visual technology into Arab newsrooms, translation involves examining how journalists, editors, and technology developers align their goals and interests to effectively use immersive technologies. Along with this study, journalists translate the capabilities of immersive technology into compelling news stories, thereby aligning their storytelling objectives with technological affordances. This highlights how the potential of immersive technology is adapted and utilized to fit journalistic practices. Also, this sheds light on how to lock actors into specific roles within the network (ibid, 1984).

In the context of Actor-Network Theory (ANT), the concept of "Translation" serves as a crucial mechanism. The “translation process” includes four stages (Callon, 1984). This can be explained according to (Wæraas and Nielsen, 2016) and (Silva, 2019) through Figure 4-3 below:

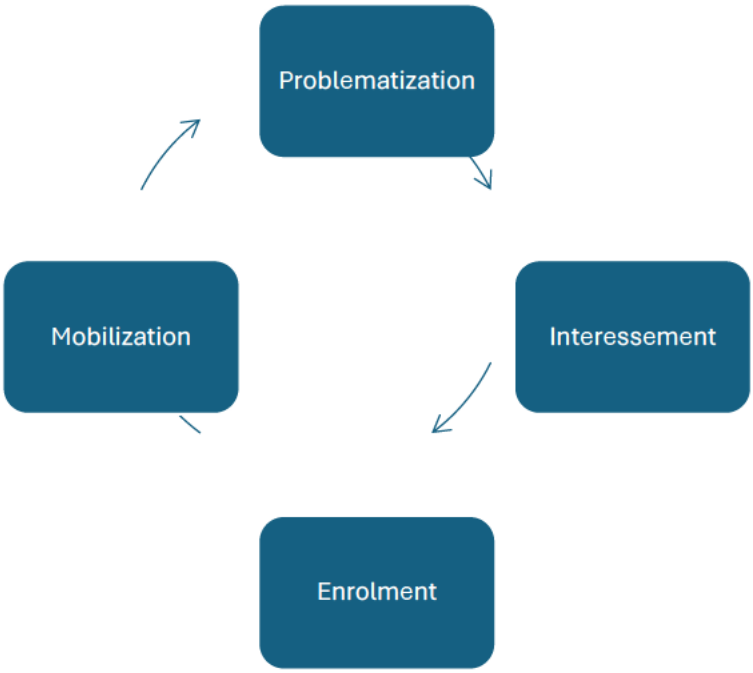


Figure 4-3: Translation process in ANT

According to the above figure, “problematization” is the first stage in which “actors offer problem statements and seek to convince others that they have the correct solutions” (ibid, 2016, p. 5). “Interessement” is the second stage, which “corresponds to the strengthening of the links between the interests of various actors” (ibid, 2016, p. 5). “Enrolment” represents the third stage, which “refers to the participation of actors and their acceptance of their role in prioritizing a particular problematization” (ibid, 2016, p. 5). Finally, “mobilization” indicates

the fourth stage, which “concerns the maintenance of the network by ensuring that spokespersons act according to its interests” (ibid, 2016, p. 5). Through “Translation,” researchers can understand how journalists engage with immersive storytelling, address ethical dilemmas, and harness emerging technologies to achieve journalistic objectives (Latour, 2007). Hence, "Translation" refers to the process by which diverse actors within a network negotiate their interests, objectives, and capabilities to establish common goals and actions (ibid, 2007). In applying ANT to the analysis of immersive storytelling in journalism, Translation manifests as the dynamic interactions between human actors (such as journalists, editors, and technology developers) and non-human actors, including immersive technologies (AR, VR, and MR).

In this study, the researcher intends to explore the use of new modern visual technology in Arab newsrooms. The theme of "affordances and opportunities" can be reflected by considering how the translation processes outlined within Actor-Network Theory (ANT) intersect with these themes in terms of agency.

1. **Problematization**: In the context of my study, this can be reflected in how introducing new visual technology in Arab newsrooms is perceived as a solution to certain challenges or limitations. Here, I would explore the affordances and opportunities presented by these technologies in enhancing news reporting, and storytelling, or audience engagement.

2. **Interessement**: This stage focuses on strengthening the links between the interests of various actors. Here, I analyse how different affordances and opportunities are perceived and prioritized using modern visual technology. This involves considering the interests of journalists, editors, and different human actors in the selected media organizations and audiences and how they align or diverge in relation to the ethical considerations associated with the use of such technology.

3. **Enrolment**: This stage pertains to actors' participation and acceptance of their role in prioritizing a particular problematization. Here, I examine how actors are enrolled in the adoption and implementation of new visual immersive technology. This also involves exploring the ethical considerations guiding their decision-making processes, such as privacy, credibility and accuracy, bias, or representation.

4. **Mobilization**: This stage focuses on maintaining the network by ensuring that spokespersons act according to its interests. In your thesis, you could explore how the ethical considerations surrounding the use of modern visual technology influence the

actions and behaviors of spokespersons within Arab newsrooms. This includes examining how journalists navigate ethical dilemmas related to the use of visual media in reporting and how news organizations establish guidelines or codes of conduct to address these concerns.

By integrating these stages of translation processes within ANT in the study of new modern visual technology in Arab newsrooms, the researcher provides a comprehensive analysis of the complex interactions between technology, ethics, and journalistic practices in the contemporary media landscape. According to Mabrook and Singer (2019) It has been brought to people's attention that ANT is a beneficial technique for embracing technology's function while considering newsrooms' changing culture and practice.

4.4 Conclusion

This chapter has employed Pierre Bourdieu's Field Theory and Actor-Network Theory (ANT) to systematically analyse the integration of immersive technologies within Arab newsrooms. Bourdieu's Field Theory has provided a robust framework for examining the 20 interviews conducted with professionals from Al-Arabiya, Sky News Arabia, and Al-Sharq. This theoretical lens has facilitated an exploration of how journalists and newsroom professionals perceive, adapt to, and negotiate the complexities of immersive technologies. By focusing on the field's internal dynamics, habitus, and capitals, the analysis has illuminated the underlying power structures and strategic manoeuvres within the journalistic domain. Simultaneously, ANT has been instrumental in dissecting the 18 videos produced by these news channels, revealing the intricate networks of relationships between technological artifacts, human actors, and organizational practices. ANT has allowed for a detailed examination of how immersive technologies are enacted and mobilized within the news production process, highlighting both the affordances they offer and the challenges they present. This approach underscores the dynamic interactions between technology and journalism, emphasizing the agency of non-human actors alongside human agents in shaping news content.

The theoretical framework combining Bourdieu's Field Theory and ANT has been depicted in Figure 4-4 on page 69, illustrating the complementary nature of these theories in analysing the two distinct sets of data. This framework visually represents how Bourdieu's emphasis on social structures, habitus, and capitals interacts with ANT's focus on networks, actor agency,

and technological mediation. Together, these theoretical perspectives have provided a comprehensive understanding of how immersive technologies are integrated into Arab

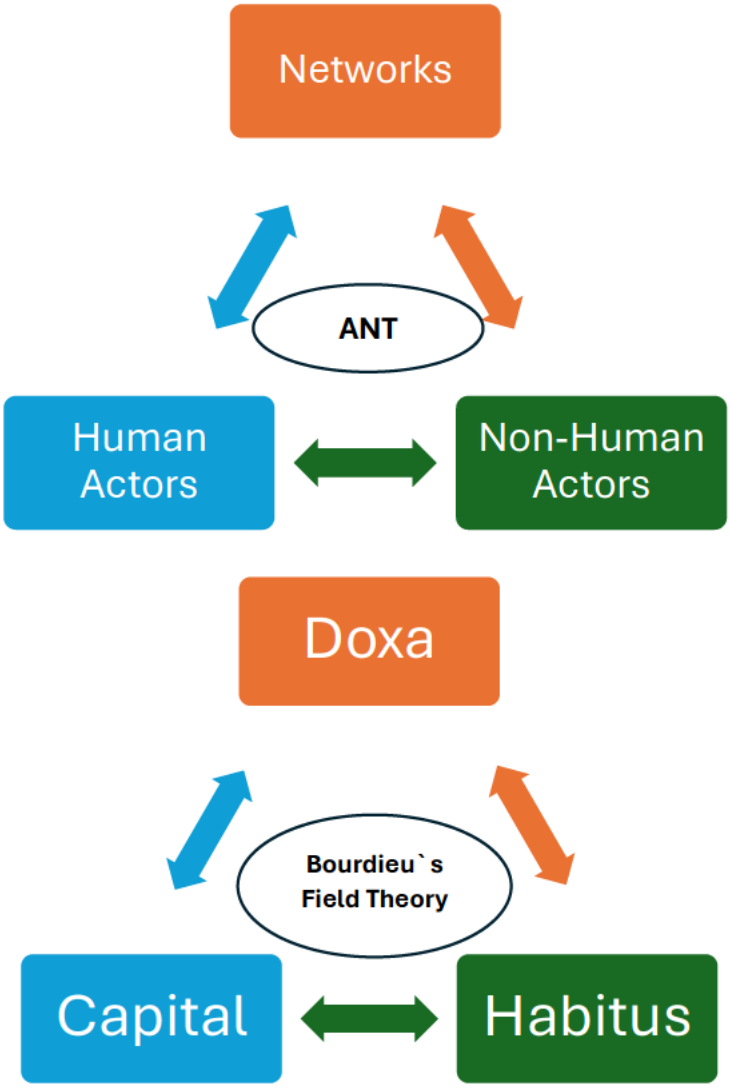


Figure 4-4: The Research theoretical framework

newsrooms from the perspectives of both organizational dynamics and technological enactments. In conclusion, the theory chapter has not only laid the theoretical groundwork for the subsequent empirical analyses but has also demonstrated the utility of a multidimensional approach to studying technological innovation in journalism. By synthesizing Bourdieu's sociological insights with ANT's relational perspectives, this thesis contributes to advancing knowledge about the transformative impact of immersive technologies on journalistic practices in Arab media contexts. This theoretical synthesis serves as a robust framework for interpreting the empirical findings and drawing meaningful conclusions regarding the implications for future research, as well as industry practices in contemporary journalism.

Chapter 5: Research Design and Methodology

5.1 Introduction

This chapter introduces the research methodology for a study aimed at understanding the integration of immersive technologies such as virtual reality (VR), augmented reality (AR), and 360-degree video and their combinations in pan-Arab newsrooms. The research seeks to contribute to the exploration of how these immersive technologies are evolving within pan-Arab news organizations, particularly focusing on the evolving roles of Arab journalists in the production of immersive content. The study aims to provide insights into the adoption, challenges, and implications of immersive technologies in the context of Arab journalism, highlighting the transformative impact on storytelling and audience engagement in the region. Therefore, this research examines how VR technology is being integrated into daily reporting, presenting Arab journalists with both new opportunities and challenges. The study aims to achieve four main objectives: Firstly, to contribute to the emerging field of immersive journalism by elucidating the motivations behind the adoption of immersive technologies in pan-Arab newsrooms. Secondly, to investigate whether there are specific patterns of immersive storytelling that have been incorporated into reporting practices. Thirdly, to understand the obstacles or limitations encountered by journalists or the immersive news industry during the production process or in their journalistic practices. Lastly, to explore new avenues and highlight the unique opportunities that immersive technology offers in the realm of news storytelling. Through these objectives, the research aims to provide insights into how VR and other immersive technologies are transforming journalism in the Arab world, addressing both the potential benefits and challenges faced by journalists in adopting these innovative tools. Regarding the structure of this chapter, Section 5.2 will outline the research strategies and approaches employed in this study. Section 5.3 will delve into the sampling techniques used to gather data. Section 5.4 will discuss the methods and procedures employed for data processing and analysis. Section 5.5 will focus on the ethical considerations inherent in conducting research on immersive journalism. Section 5.6 will explore the researcher's positionality within the study, acknowledging their perspective and potential biases. Finally, Section 5.7 will provide a summary conclusion of the chapter, highlighting the main points discussed and setting the stage for the subsequent chapters. Based on the research aims and objectives, this chapter describes the methodological techniques utilized to respond to the research questions the research questions. This includes the procedure, methods, and tools that have been chosen.

This chapter also provides a rationale and justification of these methodologies based on the value they provide to the research objectives and questions. Researchers should choose the study design that best answers the research questions as Marshall and Rossman (2016) indicated. Guiding this research were the following research questions:

RQ1: What thematic patterns have been applied via immersive technologies in pan-Arab newsrooms' reporting?

RQ2: Why have pan-Arab newsrooms integrated immersive technologies in their reporting?

RQ3: How have immersive technologies been applied in the field of storytelling within pan-Arab newsrooms?

RQ4: What opportunities do immersive technologies present for pan-Arab newsrooms in their reporting?

RQ5: What limitations do pan-Arab newsrooms face while applying immersive technologies in their reporting?

5.2 Research approach

According to Crotty methodology is "the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of your methods to the desired outcomes", such as questionnaires, surveys, experiments, interviews, or focus groups (1998, p. 3). The methodology is a critical part of research because it plays the role of processing the plan of the intellectual production procedure. Methods are "the techniques or procedures used to gather and analyse data related to some research question or hypothesis," like questionnaires, surveys, experiments, interviews, or focus groups (ibid,1998, p. 3). In other words, methods manage the outcomes' quality in terms of key aspects like precision, actuality, certainty, representation, applicability, usefulness, and contribution to human knowledge. Therefore, to provide a useful piece of knowledge about applying immersive technology in pan-Arab newsrooms, reach the outcomes at the highest levels, and increase the quality of the results, this chapter design has followed a systematic academic approach administered by instructional frame.

This research is an exploratory approach, which is defined as “research used to investigate a problem which is not clearly defined. It is conducted to have a better understanding of the existing problem” (QuestionPro, 2018). In other words, this approach is “often conducted using interpretive research methods and they answer to questions such as what, why, and how” (Dudovskiy, n.d.). Accordingly, as immersive storytelling is a new trend in visual journalism in general, and in pan-Arab newsrooms in particular, it is significant to understand and investigate if there is a set of rules, forms, and/or formulas that govern the production of immersive content. Sometimes these rules are written and sometimes not, as journalists are used to working on immersive stories in the same way each time, while they may not know why they do it that way. Therefore, an exploratory approach is applied in this research as the researcher wanted to know beyond what those people are doing. Seemingly, this approach in social sciences could be defined in many ways, but according to (Swedberg, 2020) the core of exploratory research “consists of an attempt to discover something new and interesting by working your way through a research topic” (2020, p. 17). Therefore, this approach was useful in understanding whether there is a set of rules in immersive storytelling, as I could call it, The Grammar of Immersive Narratives. Hence, the exploratory approach provided a way to explore if this grammar is hidden or explicit. Furthermore, the number of studies that dealt with the subject of immersive journalism in pan-Arab newsrooms is rare or few, and therefore, the application of this exploratory approach in this research contributed to exploring the mechanism or the way of using immersive technology in Arab newsrooms and indicating what news genres were produced using this modern technology. This approach offered a better understanding of the journalistic practice in light of the use of immersive technology, considering if there was an impact on news values or significant differences compared with traditional journalistic practice. As a result, the exploratory approach was effective and useful for this research, titled “An Examination of the Use of Immersive Technology in Pan-Arab Newsrooms”, which is the case here, as these research questions are designed to understand more about this technology integration.

Compared with other research approaches, exploratory research is “conducted during the early stages of a project, usually when a researcher wants to test the feasibility of conducting a more extensive study” (DeCarlo, 2018), as this is the case here, that is to explore and understand the immersive content practice in pan-Arab newsrooms. Descriptive research describes or defines a particular phenomenon” as the research problem is explored and understood (ibid, 2018). The descriptive research design is “used to describe a phenomenon

and its different characteristics. It is concerned with gaining a deeper understanding of what the phenomenon is rather than why or how it takes place. It, therefore, describes the subject of the research without addressing why it happens" (VOXCO, 2021). It is worth mentioning another kind of research that is explanatory research which "explains why particular phenomena work in the way that they do, answers "why" questions" as researchers try "to identify the causes and effects of whatever phenomenon they are studying" which is not the case in this study (DeCarlo, 2018). In other words, the key difference between both approaches explanatory and exploratory is that "explanatory research explains why certain phenomena work in the way that they do, whereas exploratory research explores and investigates a problem that is not clearly defined" (Hasa, 2021).

Exploratory research "is often qualitative in nature"(George, 2021). This is the case here, as this study is qualitative in that it aims to provide an in-depth analysis of selected news content as well as in-depth interviews with Arab journalists. Qualitative research is "a form of long-term first-hand observation conducted close to the phenomena under study" (Jensen and Jankowski, 2015, p. 44). In other words, "qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenformin in terms of the meanings people bring to them" (Creswell, 1998, p. 15). Also, qualitative methods "explore the reasons and motivations for perceptions, beliefs, and behaviors of people and can produce a better understanding of the lived experiences of people… primarily involve observing and talking to people" (Donley and Grauerholz, 2012, p. 40). Therefore, this methodology is chosen because it focuses on the interpretation of communications, as well as on journalists' perceptions and experiences. This contrasts with quantitative methodologies, which are usually used to measure certain aspects (e.g., the repetition of certain terms in the news) without examining the interpretations of such aspects. Schreier (2012) agreed that quantitative research "deals with numerical data, and there is little room for interpretation as to what a '3' means, or a '100'" while qualitative research "deals with symbolic material – verbal data, visual data, artifacts – which leaves much room for interpretation (p. 20). Creswell indicated that "Ragin (1987) accurately characterizes a key difference when he mentions that quantitative researchers work with a few variables and many cases, whereas qualitative researchers rely on a few cases and many variables" (1998, pp. 15–16). Hence, using quantitative methods supports gathering data regarding answering questions like how much, how many, and how often in a context of quantities, and understanding the relationship between these numbers or percentages, which "allow social researchers to systematically quantify the world in which we live" (Donley and

Grauerholz, 2012, p. 17). This is not the case in qualitative research that provides “a deeper understanding of social phenomena” (ibid, 2012, p. 40). In brief, graphs and numbers are used to represent quantitative research, while the results of qualitative aid in understanding ideas, events, or concepts, allowing researchers to gain comprehensive knowledge about poorly understood subjects by the sort of study they conducted.

The qualitative approach best suits this research aims and research questions, seeking to demonstrate how immersive technology is being applied in pan-Arab newsrooms and understand the immersive news environment by explaining the relationship between news content and immersive technology. Thus, the researcher does not focus here on numerical and statistical methods in interpreting the collected data, which is related to the case of quantitative research. However, the researcher seeks to understand the motives for using immersive technology and explore the beneficial side of Arab news channels by resorting to the use of this technology. In other words, this study is a way to answer questions related to how this technology serves the journalistic content and how it contributes to attracting Arab viewers. What are the challenges that face this new trend in news work, and what new opportunities does this technology offer to attract new viewers? In addition, does this technology contribute to simplifying the news content for Arab viewers in a way that makes it more interactive and easier to understand from Arab channels' perspective? Notably, one of the main points is how immersive technology was reflected in the journalistic practice in terms of the way of writing and presenting journalistic news stories. Consequently, qualitative research provides an understanding and explanation of the nature and mechanism of immersive journalism, which is the main reason behind applying this approach in this research. Based on the aforementioned, the researcher has identified some general ideas about immersive news environments, considering the becoming effort to explore and understand many more ideas about immersive journalistic practice through these research tools (qualitative content analysis and interviews) that will be clarified in the next section, which provides new details and deep understanding during the process of data collecting and analysis. This meets with (Elman et al., 2020) as they indicated that in the exploratory approach, “some researchers perform a key role at the beginning” identifying a problem… while others play a role further along in the process, perhaps at the stage of developing a full-fledged theory or testing that theory” (p. 15). Figure (5-1) is a procedure diagram that illustrates the process of this research study.

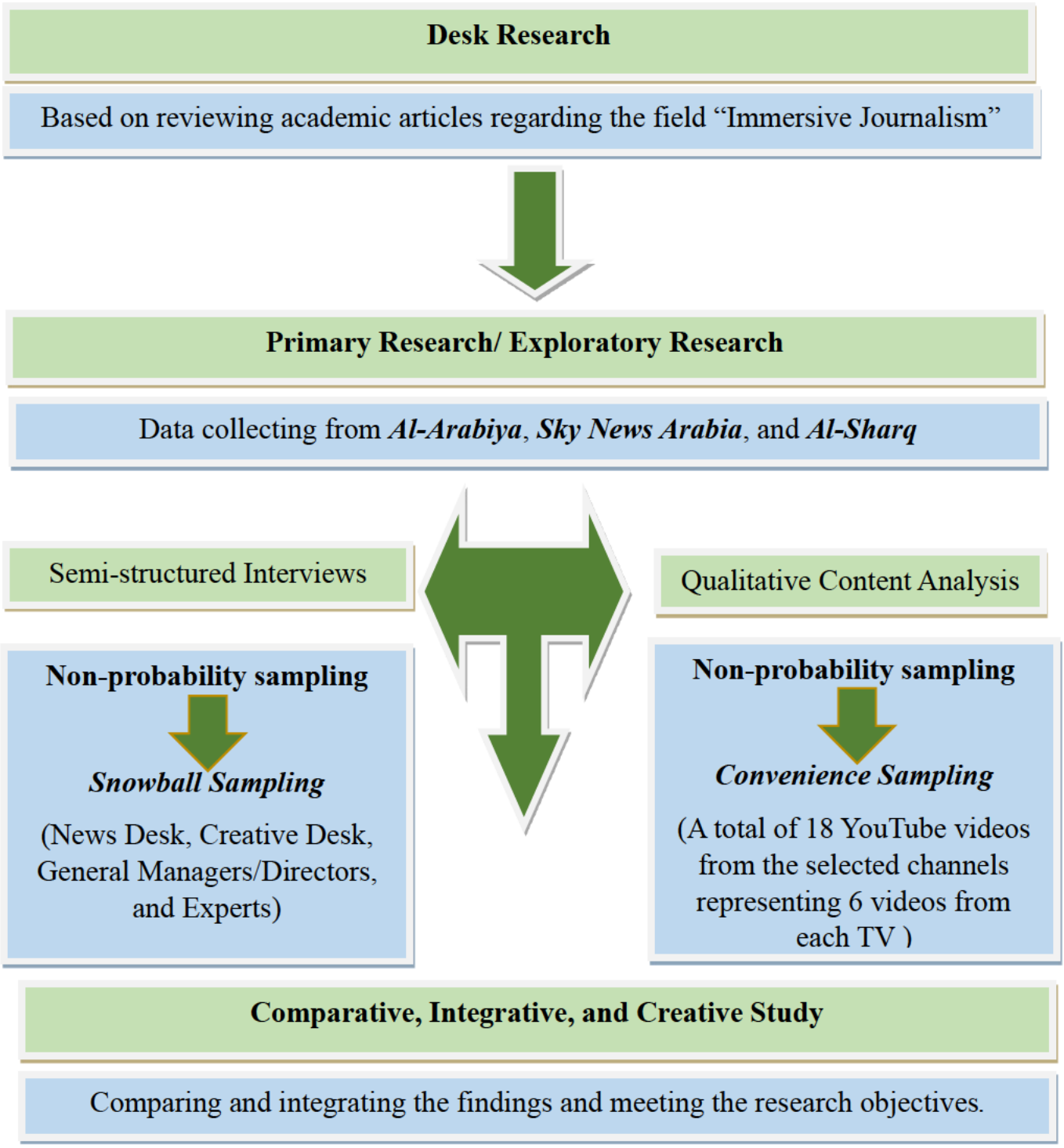


Figure 5-1 Process of the research

5.3 Data Collecting and Sampling Techniques

To identify this study sampling, Figure 5-2 below indicates a timeline that represents when each of the selected news channels launched and when each began applying immersive technology in its journalistic work.

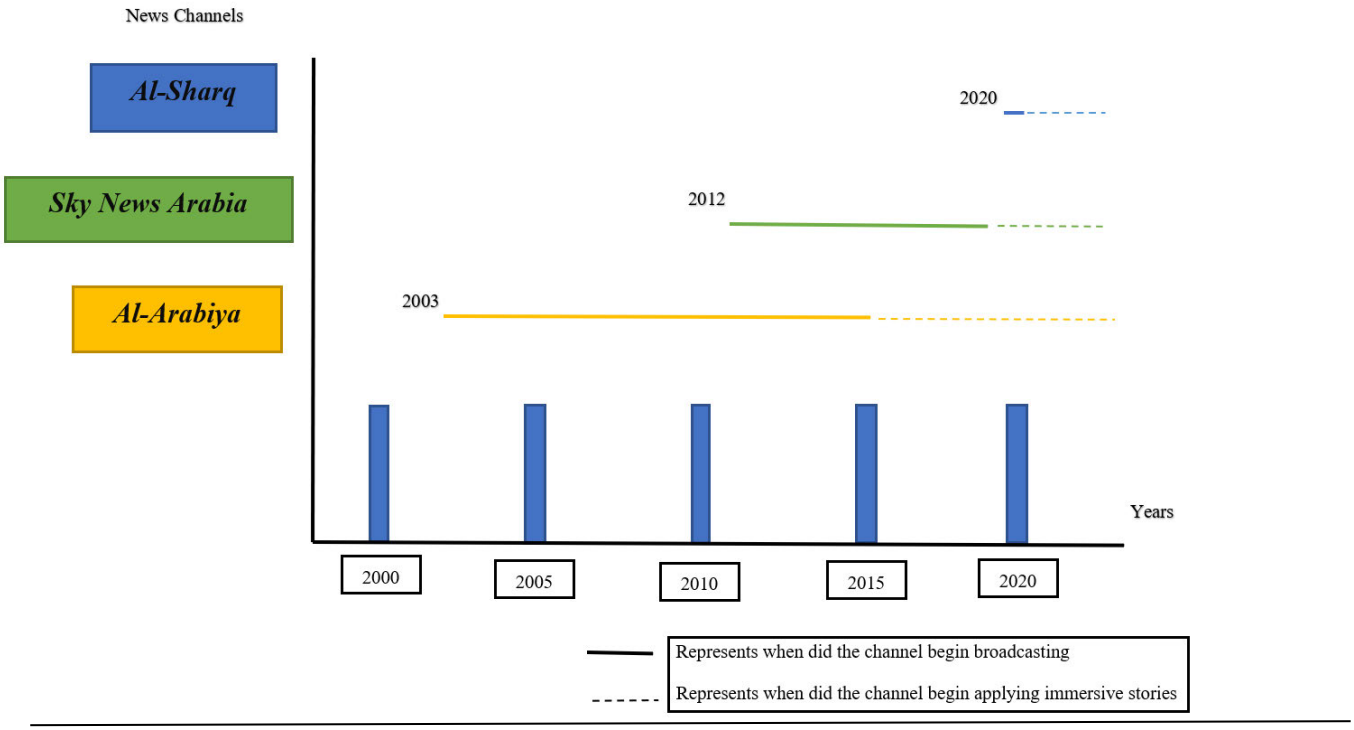


Figure 5-2 Applying immersive technology in news channels

Officially and professionally, Al-Arabiya channel was able to begin its first unique immersive work with its coverage of the US elections in 2016. It has published a number of immersive news stories on YouTube. It covered the US elections again in 2020, where it designed a studio that blends both augmented reality and virtual reality technologies, and thus won the award for the best virtual studio in an exhibition "Show NAB" of the Association of Broadcasters in Las Vegas, “outperforming of significant American channels” (Mohammad, 2022 p. 133). In 2019, Sky News Arabia “revealed the largest process of change, renewal, and development since its launch in 2012” through a number of new programmes and innovative media content applying both AR and VR latest digital technologies and television broadcasting (AlRoya, 2019). Sky News Arabia has published these immersive news stories on TOU TUBE as well. As for Al Sharq News Channel, since its launch in 2020, it has been keen to present itself strongly in the field of immersive journalism and has produced a significant number of immersive news stories, despite its recent launch, and has published these stories on its YouTube platform. The show TAQA+, a weekly economic programme that applies XR

technology, as “its atmosphere and decoration changes dynamically based on the story being told”, has won the award for "Best Use of Augmented Reality Technology and Virtual Reality in Studio" (Al-Sharq Al-Awsat, 2022).

Based on the previous Figure 5-2, this study applied Non-probability sampling techniques that “are often used in exploratory and qualitative research” (McCombes, 2019), which is the case in this study. Non-probability sampling is “a method of selecting units from a population using a subjective (i.e. non-random) method. Since non-probability sampling does not require a complete survey frame, it is a fast, easy, and inexpensive way of obtaining data” (Government of Canada, 2021). One of the techniques used in Non-probability sampling is Convenience Sampling (McCombes, 2019). The researcher applied Convenience Sampling, as he included only those immersive stories that “are most accessible and available” (Mishra, 2021). The application of this technique is considered the most appropriate and consistent with the mechanism of reaching the results. It should be noted that the benefits that Convenience Sampling is helpful for the process of data collection in this study, as it “can be facilitated in a short duration of time” (Dudovskiy, n.d.). Convenience Sampling or as it is also known as Availability Sampling, is “a specific type of non-probability sampling method that relies on data collection from population members who are conveniently available to participate in the study” (ibid, n.d.)Accordingly, the study sample will include all immersive news stories published on the platforms of the mentioned news channels on YouTube. The researcher expected that these news stories would vary in terms of narration, type of technology used, topics, etc.

Concerning the title of this study, “An Examination of the Use of Immersive Technology in Pan-Arab Newsrooms”, and the questions posed by the researcher, the study population covered the pan-Arab news channels. Remarkably, some news channels in the Arab world have enjoyed great support from the Arab governments that established and financed these channels, providing modern technology to enhance the content, make it attractive, enable to compete with other news outlets, attract new audiences, and broadcast a political discourse that fits their political vision toward the region (See Chapter 2). Concerning what this researcher mentioned in the second chapter of this study, a number of these channels were the most important Arab channels that applied immersive technology in their news content. Al Jazeera news network had the support of the Qatari government, producing and broadcasting several immersive news stories on its screen and social media platforms. The government of Abu Dhabi, UAE,

established Sky News Arabia and used modern technology to produce immersive news materials. As for the government of Saudi Arabia, and through its Al Arabiya news channel, it has a very important experience in the field of immersive journalistic production. The Riyadh government also established another channel that followed the same approach, Al Sharq TV, which made immersive journalistic content a mainstay in television news work. The researcher initially selected four news channels for inclusion in the study sample, but Al-Jazeera was excluded due to difficulties in obtaining permission from the network to participate and conduct interviews. The remaining sample comprises Al-Arabiya, Sky News Arabia, and Al-Sharq. The justification for including these channels is twofold:

Firstly, these channels are widely regarded as among the most influential in the Arab world, commanding substantial viewership and interest among the Arab public. Their prominence makes them pivotal subjects for studying immersive journalism practices within pan-Arab newsrooms. Secondly, the researcher noted that these channels frequently publish a significant volume of immersive news stories on their social media platforms. This abundance of immersive content provides ample material for exploration, analysis, and study within the context of pan-Arab newsrooms. Conversely, some other Arab television news channels that aim to reach a broad Arab audience were not included in the study sample. This decision was based on observations that these channels produced relatively few immersive news stories compared to others. Including them in the research would not have been conducive to answering the research questions or achieving the study's objectives effectively.

The scarcity of immersive production in these channels may stem from various factors, such as limited human resources, financial constraints, or technical capabilities. These factors potentially hinder their ability to adopt and implement immersive technologies in their news reporting practices. Therefore, focusing on channels with a robust presence of immersive content allows the researcher to more effectively explore the integration and impact of immersive technologies in pan-Arab newsrooms. To provide a useful piece of knowledge, reach the outcomes at the highest levels, and increase the quality of the results, the following sub-sections provide a methodical academic approach that is administered by systematic and instructional frame, indicating detailed information regarding what methods will be applied in this research, why and how these methods will be applied. In summary, the eighteen videos in this thesis video sample were posted to YouTube by three well-known Arab news channels: Al-Arabia, Sky News Arabia, and Al-Sharq. According to Ching-Jung (2023, p. 4), YouTube

is regarded as "the largest multimedia search engine and sharing platform worldwide, allowing users to upload, view, and rate videos." Six videos from each channel were included in the sample, ensuring a fair representation from various sources. The sample spans a year, starting on June 1, 2022, when the researcher started gathering data, and ending on May 30, 2023. This period of time offers a thorough understanding of how immersive technology is used in Arab newsrooms throughout a 12-month period. The two primary characteristics used to determine the selection criterion for the videos in the sample were:

1- The variety of subjects that the chosen videos covered was the first variable. To guarantee that the sample accurately reflected the depth of news coverage often seen in Arab newsrooms, various subjects had to be included. Due to this variety, a thorough examination of the integration of immersive technology across several topic areas is possible (Djamasbi et al., 2018).

2- The variety of immersive technology used in the videos, such as mixed reality (MR), virtual reality (VR), and augmented reality (AR), was the second factor taken into account throughout the selection process (Ardèvol-Abreu and Túñez-López, 2019)This ensured that a variety of immersive technologies were included in the sample, making it possible to thoroughly examine each one and how it is used in news reporting.

The sample offered a comprehensive dataset for research as it contains videos with various topics and technological applications. It provided insights into the numerous ways that news outlets use AR, VR, and MR to improve storytelling, as well as how they integrate immersive technology into their reporting on a range of topics (Hopkins et al., 2019). Videos from Sky News Arabia, Al-Sharq, and Al-Arabia were included to provide a varied representation of Arab news outlets. These channels were excellent choices for researching the use of immersive technology in news reporting since they are some of the most well-known and frequently seen news sources in the Arab world. Comparing various immersive journalism strategies is another benefit of analysing footage from various networks. Scholars may, for instance, investigate the distinctions between the immersive content categories provided by every channel and the variances in narrative approaches and tactics (Kennedy and Engebretsen, 2020). Moreover, the sample's one-year duration shed light on how immersive technology has changed over time in Arab newsrooms. Researchers may spot trends, modifications, and breakthroughs in the use

of immersive technology, as well as any new best practices or difficulties experienced by news organizations, by looking at films from June 2022 to May 2023 (Rettberg, 2020).

5.3.1 Qualitative Content Analysis

This research applied qualitative content analysis, which is “a method of analysing written, verbal or visual communication messages” (Mohajan, 2018, p. 15). Mayring agreed with this, indicating that qualitative content analysis is a way to analyse and interpret the contents of texts, including words and phrases, in addition to images or photos and videos, without including numbers or quantitative analysis (2000). Schreier identified qualitative content analysis as “a method for systematically describing the meaning of qualitative material” (2012, p. 1). This method has been applied in a significant number of studies. For instance, a study conducted by Beck and Vowe (1995) analysed 25 different media items “(newspapers, journals, radio transmissions) concerning new multimedia approaches… they found patterns of argumentation like euphoria about multimedia; economic optimism; political critic; apocalyptic predictions” (Mayring, 2000, p. 7). Another study titled “Audio and visual characteristics of television news broadcasting” used content analysis dealing with “the use of camera techniques”, trying to describe the form of television news stories” (Kline, 1977, p. 116). Qualitative content analysis is to be “done by classifying material as instances of the categories of a coding frame” (Schreier, 2012, p. 1). Another study was conducted by Vindenes and Gynnild (2020) about applying immersive technology in journalism at Euronews. This study adopts a content analysis approach as the “data material consists of 95 pieces of 360-degree videos in which we identified the topics of coverage, production choices, verbal contextualization, and techno-narrative structures” (p. 31). Using qualitative content analysis correctly intends to follow a methodical process that is simple for other researchers to duplicate and produce highly reliable results (Luo, 2019). Hence, a qualitative content analysis's goal is “to investigate meaning rather than to quantify” (Donley and Grauerholz, 2012, p. 51). Researchers “start a quantitative content analysis with a list of specifics they'll be looking for, as they do not frequently begin a qualitative content analysis with a list of requirements” (ibid, 2012, p. 51). On the other hand, in qualitative content analysis, when the materials are examined and processed, researchers make notes on the themes that emerge, so the approach is inductive, in contrast to deductive” (ibid, 2012, p. 51).

Qualitative content analysis, as outlined by (Kuckartz and Rädiker, 2023), involves a systematic approach to analysing textual data with the goal of identifying themes, patterns, and

meanings. The researcher can summarise the whole process as the following shows. The process begins with preparation, where the researcher clearly defines the research question(s) and selects the relevant textual material for analysis, ensuring alignment with the research objectives. The unit of analysis, which refers to the smallest segment of text that will be coded, is also determined at this stage. Next, a coding scheme is developed, which may be deductive (predefined based on theory or existing research) or inductive (emerging from the data itself), and coding begins by identifying relevant segments in the text and assigning appropriate codes. After initial coding, the researcher groups similar codes into broader categories or themes, ensuring these categories represent the key aspects of the data. In the data reduction phase, the researcher condenses the data by focusing on the most relevant categories and refining them through constant comparison, revising the coding scheme as needed. The interpretation phase follows, where the researcher analyses the relationships between categories, links the findings to theoretical frameworks, and develops insights about the data. Finally, the findings are reported clearly, with direct quotes from the data used to illustrate categories and support the analysis. Throughout the process, the approach is iterative, meaning that the coding and categorization steps may be revisited as new insights emerge. Contextualization of the data and reflexivity regarding the researcher's influence on the analysis is essential to ensure the findings are robust and meaningful. Although qualitative content analysis can be conducted manually, which was applied in this thesis, researchers often use software tools such as MAXQDA or NVivo to assist with coding, categorization, and data management, especially for large datasets.

As discussed before, this study is an exploratory approach, so, there were no predefined categories, but according to the researcher's knowledge, there were two main starting points. First: The selected newsrooms utilised immersive technology in news production, as they are used to producing immersive news content. Second: These channels published these immersive news stories on their YouTube channels. Accordingly, the qualitative content analysis method from an exploratory view contributes to illustrating how these two elements, "news content" and "immersive technology" are connected and applied together for an immersive storytelling experience in pan-Arab newsrooms. Regarding the content, as the integration of immersive technology into newsrooms is a new phenomenon in the Arab world, it could be said that there are no established rules that define the established structure of immersive narratives. In other words, there is no established grammar (The Grammar of Immersive Narratives as discussed earlier in the Research Approach Section) that defines established models of immersive

narratives. By content analysis approach from an exploratory view, it was possible to understand if there is a certain model, or maybe more models, that is/ are adopted in writing immersive content and indicate the nature of this style and other related details. While there are different styles of writing that journalists use while working on their journalistic pieces, among them is the so-called Inverted Pyramid Style. In traditional journalism, the so-called Inverted Pyramid Style "refers to a story structure where the most important information (or what might even be considered the conclusion) is presented first. The who, what, when, where, and why appear at the story's start, followed by supporting details and background information" (Schade, 2018). This leads us to check if there is a specific style in VR writing. Does immersive content follow the same traditional journalistic structure in writing, or are there no bullet rules in immersive narratives?

Another aspect to explore is an objective description of immersive stories that have been produced in pan-Arab newsrooms. That is, it is important to observe what immersive news genres were chosen by editors-in-chief or other concerned journalists in charge. In other words, the researcher would try to answer certain questions through a content analysis approach, such as: Are there news genres that have priority to be produced in an immersive form, technological, political, health, and sports forms? Did the immersive production focus on humanitarian topics or news that discusses issues with a social dimension so that an immersive story is produced dealing with poverty, unemployment, and human suffering due to disasters and crises?

Additionally, content analysis through an exploratory view determined whether the use of this technology will necessitate the public use of a specific means to view immersive news stories. In other words, for example, in the case of 360-degree video technology, users are required to utilise their smartphones, as they will not be able to get into an immersive viewing experience if they watch these stories on TV. Smartphones will allow the users to move it horizontally and vertically in all directions by 360 degrees, and thus they will be able to see all the details according to what they choose. That is, the user will choose which shot or which side he wants to focus on. While the use of augmented reality technology does not necessarily require the use of other means, as the user can watch the news story on the TV screen, although virtual reality glasses such as Oculus will, of course, provide an immersive experience on a deeper, more interactive, and immersive level. Accordingly, it is possible to determine the trends of news channels toward what is the desired means of viewing so that the audience can

watch through the immersive news content that those channels produce. One last point could be added here that some other observations could contribute to this technology discussion, such as if there is a need to use traditional technology in news work (graphics as an example) parallelly with immersive technology. From the researcher's point of view, the analysis of the content in this aspect would help answer a question related to whether immersive technology is sufficient in the television news work environment.

Based on that, content analysis helped answer this research question and stand on other new aspects or ideas to be explored through the content analysis process. Basically, the researcher used this method to analyse the content which is exhibited on the broadcasting of the mentioned news channels (Sky News Arabia, Al-Arabiya, Al-Sharq) from two different perspectives, the content itself (the narrative) and the immersive technology that has been used in the narratives. Accordingly, the researcher defined categories as a crucial point in content analysis. As discussed previously, these channels were chosen due to their significance in the field of immersive journalism in the Arab world. They have produced so many immersive stories and published them on their YOUTUBE channels as well. This will help the researcher to set out a good representative sample of immersive stories. (See Section 5.3, which explains many more reasons that made the researcher choose these Arab channels exclusively). The researcher is going to apply the content analysis method to immersive news stories from the mentioned channels. It is worth mentioning that immersive news stories are those visual journalistic pieces that are created in the form of virtual reality (VR), augmented reality (AR), and mixed reality (XR), which is a mix of these various technologies together (Gynnild et al., 2020), (See Chapter 3).

5.3.2 Semi-structured interviews

In-depth interviews are a significant method, which is “a style of interviewing that encourages interviewees to produce ‘thick descriptions’ – where interviewees are specifically encouraged, by questions and other verbal and non-verbal methods, to produce elaborated and detailed answers” (Seale, 2007, p. 15). Some relevant research used interviews with journalists (e.g. Khaled Abdel-Sattar, 2014). A research titled “A framework for immersion in virtual reality”, which is closely related to this research in terms of the field of the topic has utilised the so-called Semi-structured interviews, which “by definition take place in between structured and unstructured versions, consisting of several key questions to help to define the areas of research exploration”(Kanamgotov, 2015, p. 34). Accordingly, Data Recording is a very

important process, which is “a form of social interaction. In this sense, social interaction is both the phenomenon under investigation and how the phenomenon is investigated” (Jenks, 2018, p. 118). The data will be collected by semi-structured interviews with open-ended questions. This type of interviews provides the interviewees “with some guidance on what to talk about, which many of them find helpful” as it enhances a wide space of flexibility so it “allows for the discovery of additional themes or elaboration of existing areas, which were not thought of by the research team” (Kanamgotov, 2015, p. 34). Therefore, this approach will be useful for this exploratory study, as the interviews will provide the researcher with deep details related to producing immersive news stories in terms of two main pillars: content and technology. This method is chosen to provide an in-depth understanding of the use of immersive technology inside the selected newsroom. In other words, if necessary, the questions can be changed during the interview within certain parameters. The questions were created with a flexible time meeting in mind. Each interview will not be less than 1 hour. All interviewees, however, will be offered extra time to provide more detailed information and conversations. During the interviews, certain new topics could surface, and the sessions' flexibility allowed these concerns to be discussed.

As previously mentioned, this study applied Non-probability Sampling techniques. As for the interviews, the researcher applied Snowball Sampling, which is “used to recruit participants via other participants. The number of people you have access to “snowballs” as you get in contact with more people” (McCombes, 2019). Adopting snowball sampling also captures a positive reason to use, as there is a possibility to increase the number of interviews as soon as there is an opportunity to communicate with candidates with experience in the field of television news work, in order to serve this study field. In other words, this approach allows the sample to grow according to the networks of those of the original sample. Through the researcher's work in the field of media and news channels, the researcher has networks with the editors-in-chief of the news channels included in this study. Thus, the researcher, after obtaining ethical approval from the University of Derby (UoD) (inserted on page 210 in the Appendix) permitting him to begin with the data collection stage, contacted the editors-in-chief from this study sample (Al-Arabiya, Sky News Arabia, and Al-Sharq) and explained to them the nature and objectives of this study so that he could conduct the interviews. Thus, the researcher conducted interviews with the editors-in-chief first, and later on, they, in turn, guided the researcher to the concerned staff. It is worth noting that the researcher adopted two types of interviews to answer the research questions and explore more about the nature of news

work using immersive technology. The first type is related to the content, which requires interviews with the so-called News Desk, which includes editors, reporters, journalists, and producers. Thus, this sample will include those who have been nominated by the editors-in-chief without any restrictions on gender, years of experience, or job grade. It is noted that this category includes journalists, editors, reporters, and producers, or such name of positions who are used to working with immersive content, that is, those who are responsible for the editorial content of the immersive story, starting from choosing the topic, determining the most prominent axes of the story, passing through the process of writing the story and its editorial production, and ending with the recommendations that they send to the technical department for implementation. Hence, these interviews helped answer the research questions, examine their interpretation of the role of digital media in communicating news, their evolving role as gatekeepers of information, and their rationale for selecting certain digital tools in reporting about certain topics, and not others, and explore much more about the field of immersive journalism in the Arab world. The second type is related to technology, which required interviews with the Creative Desk from this study sample (Al-Arabiya, Sky News Arabia, and Al-Sharq) such as technicians, video editors, and VR designers, who apply immersive technology to the journalistic content. Editors-in-chief also guided the researcher to the director of the creative desk, who recommended candidates or technicians for the interviews, as this will lead the researcher to identify more technicians involved in the immersive production process. Hence, the negatives of choosing the wrong sample or bias for a particular sample are bypassed. In more detail, this study involves analysing transcripts of interviews conducted with 20 industry professionals grouped into four categories. These groups are the News Desk (editors, journalists, writers, reporters, producers), the Creative Desk (video graphic designers, video editors, visual technicians), the Decision-Making group (general managers, editors-in-chief, news directors) from selected news channels (Al-Arabiya, Sky News Arabia, and Al-Sharq), and Experts representing senior professionals from other selected channels involved in news story scripting or visual content creation within immersive journalism. These interviews offer deeper insights into the use of immersive technology, justifying its integration within the industry and enhancing understanding of journalistic practices in this context. Therefore, analysing these interviews is crucial as it provides insights into the perspectives of journalists actively involved in adopting and implementing these technologies. Patton (2015) argues that such insights contribute significantly to understanding the contextual factors influencing technology adoption. Through qualitative analysis of these interviews, the study aims to provide a comprehensive understanding of the complexities involved in integrating modern

technology into pan-Arab newsrooms. Qualitative content analysis is chosen to delve into meanings rather than quantitative aspects, making it suitable for exploring how immersive technology is utilized from a newsroom perspective in pan-Arab contexts. Qualitative research, characterized by "long-term first-hand observation conducted near the phenomena under study" (Jensen and Jankowski, 2015, p. 44), seeks to understand phenomena in natural settings and interpret them based on the meanings individuals assign to them (Creswell, 1998, p. 15). Additionally, qualitative methods explore reasons and motivations behind people's perceptions, beliefs, and behaviors, providing deeper insights into their lived experiences through observation and dialogue (Donley and Grauerholz, 2012). Therefore, the number of interviews will be enough to gather and obtain a high level of data that would provide answers to the research questions.

The Table titled “Interviews` Questions” in the Appendix illustrates the interviews questions the researcher asked during the interviews. Through the accompanying questions, it is obvious that they are closely related to the research questions, which helps seek to answer them and explore further. The following questions encapsulate the main ideas this research seeks to address; however, additional questions are derived from participants' responses. For clarity, the questions are divided into five main areas:

- **Introductory Questions:** These are questions aimed at understanding the study participants in terms of their job title, responsibilities, and their experience within the news organization or immersive technology field.

- **Technology:** The questions relate to immersive technology, its types, the channel's use of various forms of it, and its relationship with news content. They encompass everything related to understanding the nature of using immersive technology in journalistic practices within newsrooms.
- **News Content:** The questions focus on news content, specifically regarding immersive journalism writing, the most suitable topics for production from the perspective of immersive technology, and how immersive technology has contributed to enhancing news content and presentation.

- **Opportunities:** This area is dedicated to understanding and extracting the perspectives gained by Arab newsrooms through the use of immersive technology. This means highlighting all the positives, benefits, and advantages that have

impacted news production, presentation, and delivery methods. It also involves examining news channels' viewpoints on how the use of this technology has affected audience perception.

- **Challenges:** This area has been dedicated to highlighting all the obstacles, impediments, and challenges facing the use of immersive technology in Arab newsrooms. This also means understanding the nature of these challenges in terms of technology usage itself, challenges related to the workforce constantly interacting with technology, and identifying all types of logistical challenges.

However, this has not prevented the researcher from directing additional questions derived from participants' responses in this study in order to obtain more information that enriches the subsequent analysis process.

The researcher indicates in the following Table 5-1 and Table 5-2 on pages 88 and 89 professional differentiations in the habitus of these interviewees' roles identifying the main four groups, job titles, number of participants of each group, work descriptive of each group, gender, and pseudonyms.

Group Number & Name	**Number of participants**	**Group work descriptive**	**Pseudonyms /Gender**
	Interviews conducted in 2023		
1- News Desk	9	A news desk is the nerve centre of a newsroom, where journalists and editors work together to gather, verify, and produce news stories for publication or broadcast. It serves as the hub where incoming information from reporters, wire services, and other sources is processed and evaluated for newsworthiness.	IVW3/M IVW4/F IVW5/M IVW6/F IVW14/F IVW11/F IVW12/F IVW17/F IVW20/M
2- Creative Desk	3	The creative desk within a media organization is where visual storytelling and design expertise converge to enhance the presentation and impact of journalistic content. It functions as a specialized unit that collaborates closely with journalists and editors to transform news stories into visually compelling narratives.	IVW9/M IVW15/M IVW18/M
3- General Managers & News Directors	3	General Managers and News Directors hold pivotal roles within media organizations, each contributing distinct leadership functions that are integral to the overall operation and strategic direction of the newsroom.	IVW2/M IVW8/M IVW10/M
4- Outside Experts	5	They play a critical role in enriching the research about news content's external perspective. These experts bring specialized knowledge, insights, and perspectives that complement the internal expertise of both the news desk and creative desk within the newsroom.	IVW1/M IVW7/M IVW13/M IVW16/M IVW19/M
			Total participants 20

Table 5-1: Main 4 groups of the research

Media Outlet/ Outside Experts	Names	Job Title
Al-Arabiya	IVW5	TV Presenter-Journalist
	IVW6	TV Presenter/ Journalist
	IVW3	TV Presenter/ Journalist
	IVW8	Managing News Editor
	IVW18	Creative Manager
Sky News Arabia	IVW11	TV Presenter
	IVW12	Journalist
	IVW20	Producer
	IVW10	Group Editorial Director
	IVW9	Deputy Head of Creative
Al-Sharq	IVW2	General Manager/ News Director
	IVW4	Journalist
	IVW14	Journalist
	IVW17	Journalist
	IVW15	Senior Graphics Designer
Experts (Outside the selected TVs)	IVW16	Academic Professor
	IVW7	Journalist
	IVW19	Former Managing News Editor
	IVW1	Strategic Creative Innovator
	IVW13	Managing News Editor

Table 5-2: Interviewees` pseudonyms and job titles

5.4 Data processing and analysis

This stage of data processing and analysis "occurs when data is collected and translated into usable information… it is important for data processing to be done correctly so as not to negatively affect the end product or data output" (Talend.com, n.d.). The analysis approach the researcher applies is "thematic analysis" which is "a method for identifying, analysing, and reporting patterns (themes) within data. It minimally organises and describes your data set in (rich) detail" (Braun and Clarke, 2006, p. 6). It is worth mentioning that this process "was originally developed for psychology research by Virginia Braun and Victoria Clarke" (Caulfield, 2019). It is mainly "applied to a set of texts, such as an interview or transcripts. The researcher closely examines the data to identify common themes – topics, ideas, and patterns of meaning that come up repeatedly" (Caulfield, 2019). This method has been chosen due to the flexibility it allows to analyse qualitative data, "seeking to understand experiences, thoughts, or behaviors across a data set" (Kiger and Varpio, 2020, p. 1). From its definition, the whole process depends on creating themes from the collected data that is derived from both qualitative visual content and interviews to be conducted in this research. Hence, themes "are actively constructed patterns (or meanings) derived from a data set that answer a research question, as opposed to mere summaries or categorizations of codes" (ibid, 2020, p. 1). There are various ways to conduct a thematic analysis (Caulfield, 2019), but the researcher follows the common six-step process. The six-step guide mainly includes familiarising yourself with your data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report (Braun and Clarke, 2006, pp. 16–23). Figure 5-3 below indicates their six-phase process.

Figure 5-3: Braun` s and Clarke six-phase process

For this research, the content is coded according to pre-established categories, from which topics about the incorporation of immersive technology and its influence on journalism are extracted. The study's goals and research questions inform the development of a coding frame that is used to analyse how immersive technology is incorporated into journalistic practice (Kennedy and Engebretsen, 2020). In order to code the news items, the researcher carefully examined the chosen pieces and categorized the information using the pre-established categories listed in the coding frame. The researcher extracted themes from the coded content

that speak to the study questions on the use of immersive technology in Arab newsroom journalism. According to Ardèvol-Abreu and Túñez-López (2019), these themes provide insights into the affordances of such use in news reporting. This aids in identifying patterns, trends, and difficulties pertaining to the incorporation of immersive technology and its influence on journalistic practices by methodically analysing the news story material (Hopkins et al., 2019). At this point, using qualitative content analysis (QCA) is important. QCA, according to Mayring (2000), is a technique for analysing and evaluating text without the use of numbers or quantitative analysis, including words, phrases, images, and videos. This research uses the thematic analysis methodology, a method that looks for, analyses, and extracts codes, patterns, or themes from the video sample (Caulfield, 2019).

The structure of content analysis focuses on themes. Hence, the researcher was inspired by two significant studies when deciding to apply thematic content analysis in their investigation. The first study, conducted by Miriam Ross (2022), is titled "Technological affordances versus narrative delivery?: The practice of recent virtual reality storytelling." Ross's work delves into how emerging virtual reality (VR) technologies are shaping the narrative process in storytelling. The second study, by De Bruin et al., (2022), titled "A first-person promise? A content-analysis of immersive journalistic productions," explores the increasing use of immersive techniques in journalistic productions across various media outlets. Both studies offered valuable insights that guided the researcher in deriving themes and subthemes that could be applied to understanding how new media, particularly VR and immersive techniques, are transforming storytelling and journalism.

Miriam Ross's research focuses on the ways in which virtual reality (VR) can enhance or complicate storytelling practices. She investigates the technological affordances of VR, exploring how its unique properties—such as interactivity, immersion, and spatialized audiovisual data—can either enrich or detract from the narrative experience. One key takeaway from Ross's study is that a new generation of storytellers has begun to recognize the potential of VR in offering new opportunities for engaging audiences. While traditional forms of media, such as television and film, rely on passive consumption of content, VR introduces a layer of interactivity, allowing users to navigate environments and engage with the narrative in a more active manner. Ross's study identifies the dual nature of VR's technological affordances: while VR's immersive experience can facilitate deeper engagement with the story, it also raises questions about the effectiveness of its interactivity. One major concern noted in the study is

how the immersive qualities of VR, such as the spatialized audiovisual elements, may serve to distract viewers instead of enhancing the storytelling process. As VR becomes more integrated into creative practices, it is important to explore whether these technological affordances add value to the narrative or if they become superfluous elements that clutter the experience. The research draws attention to the need for a balance between technological innovation and the integrity of narrative delivery. Ross emphasizes the importance of understanding the value of VR's interactivity, suggesting that the use of VR should not merely showcase the technology for its own sake. Rather, it should be employed in ways that align with the story being told, supporting its emotional or thematic content. This theme is particularly relevant in the context of narrative design in VR, where creators must consider how technology can amplify the themes of the story without overshadowing them. Ross's work offers a crucial perspective on how new technologies can be implemented thoughtfully in the service of storytelling.

The second study that inspired the researcher's thematic analysis is by De Bruin and colleagues, titled "A first-person promise? A content-analysis of immersive journalistic productions." In this research, the authors analyse the growing trend of immersive journalism, where news outlets are increasingly adopting immersive techniques to deliver news stories. The study reviews 189 journalistic productions that are labeled as immersive by the producers, encompassing a range of formats, including 360-degree videos, computer-generated virtual reality, and interactive web productions. These productions are sourced from various outlets and countries, highlighting the global shift toward immersive storytelling in journalism.

De Bruin's study reveals a significant trend in modern journalism, where traditional methods of reporting are being supplemented with immersive media technologies. The study's findings emphasize that major news outlets are exploring the potential of immersive formats to offer a deeper, more engaging perspective on news events. Immersive journalism allows for a more personalized experience, often placing viewers within the scene, giving them a first-person perspective on unfolding events. This shift from traditional, text-based reporting to more experiential forms of journalism is seen as a way to increase empathy and understanding, as it allows audiences to feel as though they are physically present at the scene of the story. However, the study also raises questions about the effectiveness and implications of immersive journalism. While immersive formats hold the promise of offering more engaging and impactful experiences, there is an underlying concern about whether they always serve to enhance journalistic content. For instance, some critics argue that immersive techniques could

risk sensationalizing the news or distracting from the substance of the story. The study touches on the balance that must be struck between utilising technology to engage the audience and maintaining the ethical and informative core of journalism. De Bruin's work, like Ross's, underscores the importance of integrating technology in ways that support the core purpose of the medium, whether that is storytelling or news reporting.

The researcher applied thematic content analysis to these two studies, drawing from the themes identified by Ross and De Bruin. In Ross's study, the focus was on the technological affordances of VR and their impact on narrative delivery. The researcher recognized the themes to get a better understanding of how new technologies are being integrated into narrative design and the challenges that come with ensuring that technology serves the story, rather than dominating it. The derived themes provided a framework for exploring the intersection of technology, narrative, and ethics in modern media practices. Thematic content analysis allowed the researcher to examine the central concepts in both studies and apply them to their own analysis of VR storytelling and immersive journalism.

When differentiating between the modes of analysis for the content analysis of videos from the selected channels (Al-Arabiya, Sky News Arabia, and Al-Sharq) and the analysis of interview transcripts with 20 professionals and experts, it is crucial to acknowledge the distinctive nature of these data sources and the methodologies employed. Content analysis, as conducted on 18 selected videos, entails a systematic examination of textual and media content to discern patterns, themes, and underlying meanings through structured coding (Krippendorff, 2019;(Neuendorf, 2017). This methodological approach involves categorizing elements such as visual cues, discourse patterns, and narrative strategies employed by news channels in presenting information. In contrast, analysing interview transcripts with professionals and experts necessitates a more interpretative and qualitative approach. Researchers delve deeply into the nuances of participants' narratives, employing techniques such as thematic analysis to uncover emergent themes and contextual meanings within the personal accounts shared (Braun & Clarke, (2006); Rubin & Rubin, (2005). These interviews provide rich insights into the subjective experiences, perspectives, and decision-making processes of individuals involved in the news industry, offering a nuanced understanding beyond what is observable through content analysis alone. Moreover, the differentiation in data sources between content analysis of media content and interview transcript analysis of personal narratives demands a nuanced and detailed description of the analytical processes employed for each method. While both

content analysis and interview transcript analysis share the overarching goal of uncovering insights, their methodologies and priorities diverge significantly. Content analysis emphasizes objectivity, systematic categorization, and quantitative measures to identify trends and patterns across a corpus of media content. In contrast, interview transcript analysis prioritizes capturing subjective experiences, contextual nuances, and the complexities inherent in individuals' interpretations and responses to media practices (Saldana, 2021). Therefore, the analytical process involves not only documenting and contrasting these differing priorities but also reflecting on how these distinct methods complement each other within the study design. This integration enhances the depth and breadth of findings by providing a comprehensive understanding of both the structural aspects of media content and the human dimensions revealed through interviews, thereby enriching the overall research outcomes (ibid, 2021).

5.5 Ethical Considerations

One key ethical concern is the anonymity of the researcher's interviewees. Therefore, participants were guaranteed of anonymity, as no personal identifiers such as names will cited in the dissertation. The types of respondents the researcher aimed for are employees from the selected channels and experts from out these channels as explained above, depending on a snowball sampling technique. The researcher used his networks in these newsrooms, as he contacted their editors-in-chief who recommended the candidate and provided the researcher with details about who is highly involved in the immersive production process from each desk. The researcher contacts the editor-in-chief in each outlet and ask to identify those producers and technologists working with immersive technology. Another list of some more journalists and technologists whom I know was added. The researcher arranges with the interviewees regarding the venues that the interviews will take place in, offering alternative locations to ensure the convenience and safety of the respondents. Before the interview, the consent form and the information sheet were sent to the participants to allow them enough time to read and eventually comment on the research before the interview. The respondents were first taken through a short introduction before the commencement of the interviews to ensure all respondents were at ease and happy to proceed. After that, the researcher went on explaining all the procedures involved, the ethics, and what can be expected from the interview in adding to the field of knowledge in the context of the research's aims and objectives. One hour was dedicated for conducting the whole interview. The interviews were conducted in Arabic and transcribed by the researcher. Extracts from the selected interviews were translated into English

and used in the final dissertation and subsequent publications. To ensure the accuracy of the translation, the researcher first consults with his supervisory team if it would be possible to share a short translation extracted from an Arabic-speaking academic to ensure that the translation is correct. On the consent form, there was a consent checklist indicating confidentiality, anonymity, and permission. Participants were asked to provide basic demographic information such as gender, education, professional experience, job responsibility, etc. The researcher as he knows the participants' names, will not indicate them in the dissertation, but use abbreviations as anonymity is ensured to all respondents unless they choose to be named. Another ethical issue is to ensure that all participants are informed of their right to voluntary participation in this study, which means that any of them have the choice to withdraw their consent. Therefore, the consent form includes in written words that participation in this research project is voluntary, and participants will be given the choice to opt-out or withdraw their participation within a month of the interview. All respondents were informed that the data collected will only be used for academic purposes and only for this project. All interviews were recorded and then transcribed for data analysis. After transcribing, all the recordings were kept on the University systems with encryption until this project is completed and the subsequent publication of findings. The data will be kept for at least 3 years.

5.6 Positionality

Positionality "reflects the position that the researcher has chosen to adopt within a given research study" (Savin-Baden and Major, 2013, p. 71). Andrew Gary Darwin Holmes (2020, p. 2) states that positionality is identified by positioning the "researcher's subject under investigation", "the research participants", and "the research context and process". Equally, Malterud affirms that reflexivity starts with the recognition of assumptions that are part of the study, beginning with the depiction of previous personal and professional experiences (2001, p. 2). According to Malterud, this becomes before introducing what will be examined and how and concluding with the reason and interests for carrying out a research project (ibid, p. 2) . If I wish to discuss my positionality in this research, I will first explain why I chose this study area: immersive journalism. It was remarkable to view a video produced by the Russia Today/Arabic division, which happened to be the first news channel among the Arabic language and Arabic-speaking channels to use digital tools, trying to attract millions of Arab viewers. It broadcasted the first news bulletin using virtual reality technologies, allowing the presenter to experience the news through a virtual battlefield. This broadcast began with a scene

of Israeli warplanes firing missiles at the capital of Syria, Damascus, followed by a shot of flames engulfing the studio where the channel`s presenter was anchoring the news. Following that, viewers witnessed another intense scene as a massive tank passed close to the anchor, launching a projectile whose fumes spread throughout the studio, causing the presenter to begin wheezing. (RT, 2013). When I viewed this video, I did so from two distinct vantage points. As a journalist and an academic, I present my positionality in this study from the same perspectives. The first perspective relates to discussing my function as a practitioner of journalism for almost 15 years as a journalist and TV presenter. This video prompted me to ponder the impact of modern technology, such as virtual reality, on the news industry and how this industry will open up new horizons for delivering news in a contemporary manner. Additionally, is it feasible for satellite channels in the Arab world to heavily integrate and rely on these technologies for the production of news stories? This video was truly extraordinary, as I witnessed entirely novel journalistic content, far removed from conventional styles of reporting the news. What also attracted my attention was the fact that the announcer had abandoned the classic, conventional way of anchoring the news. It appeared that he desired to advance from the level of traditional news reporting to that of interactive news reporting.

Years later, I joined Sky News Arabia at its headquarters in Abu Dhabi, the capital of the United Arab Emirates, and it was a fantastic opportunity to learn how to incorporate cutting-edge technologies such as virtual reality, augmented reality, and extended reality into the news industry. I began to understand that this technology is versatile and has a variety of applications. I was a witness to the launch of a remarkable process of change, renewal, and development, with the creation of a modern newsroom by investing in the latest visual broadcasting technologies, and new news studios based on virtual reality (VR) and augmented reality (AR) technologies, which interact with programme presenters and guests and the content itself. After that, I transferred to Al-Arabiya / Al-Hadath news channel in Dubai, where I also witnessed the use of this technology in the US presidential election between Donald Trump and Joe Biden at the time. During that period, Al-Arabiya channel collaborated with one of the most prominent American firms in the field of visual creativity. As a result, I developed a fundamental understanding of how this technology is utilized in the newsroom, as I was a witness to it in one of the most prominent and influential news channels in the Arab world.

Regarding my academic positionality, I would say first that I earned a bachelor's degree in journalism and a master's degree in new media. My academic background has undoubtedly

added a new dimension to my practical experience as a journalist. This is evidenced by the acquired theoretical foundation for journalism, which is particularly reflected in media theories, news values, and theoretical formulation of journalistic practice. In other words, the study of what news is, news writing templates, news accreditation standards, editorial policy, and various styles of journalistic practice, including news, reports, investigations, and interviews. With this academic and professional foundation, I decided to pursue a Ph.D. in immersive journalism, a form of journalism that relies on the incorporation of modern technology such as virtual reality. I wanted my professional experience to serve as a foundation for understanding what this new form of the journalistic narrative is, but within the confines of a tight research project based on scientific research methodologies, so that this study constitutes an enrichment and addition to academic research in the field of journalism, particularly since the research library in the Arab world is not rich in this new journalistic field. To conclude, it is crucial to clearly articulate how my personal experiences and professional background in journalism have shaped your approach to the study of immersive journalism. Positionality in this context refers to my subjective stance, informed by my roles as a journalist and academic researcher within the Arab news industry. My extensive career as a journalist with Al-Arabiya and Sky News Arabia has provided me with firsthand exposure to the integration of immersive technologies like virtual reality and augmented reality in news production. Witnessing the pioneering use of these technologies, such as during the Russia Today/Arabic division's virtual reality news broadcast, influenced my interest in exploring the implications and potentials of immersive journalism. This experience not only sparked my curiosity but also provided a foundation of practical insights into how these technologies are transforming news storytelling in the Arab world. Moreover, my academic journey, which includes a master's degree in new media and pursuit of a Ph.D. in immersive journalism, underscores my commitment to bridging practical experience with theoretical inquiry. My academic background has equipped me with theoretical frameworks and research methodologies essential for conducting a rigorous study on immersive journalism. This blend of practical experience and academic training has shaped my research objectives, focusing on demonstrating the rationale for immersive technologies in Arab newsrooms and exploring their impact on journalistic practices and storytelling formats. Regarding research design, my positionality as both an insider and researcher necessitates transparency regarding my subjective perspective and insider knowledge of the industry. This reflexivity allows me to critically reflect on how my biases, assumptions, and professional experiences may influence the research process and findings. By acknowledging my role as a participant observer in the news-making process, I can provide full disclosure of how my

background informs the research design, data collection methods, and interpretation of results. Embracing a reflexive approach to my research involves openly discussing how my dual roles as a journalist and academic researcher inform and enrich the study of immersive journalism. This self-awareness enhances the credibility and transparency of my research, demonstrating a thoughtful integration of personal experiences with scholarly inquiry to advance understanding in this emerging field.

5.7 Conclusion

In examining the utilization of immersive technology within Pan-Arab newsrooms, this research has employed a rigorous methodological approach aimed at exploring the multifaceted dimensions of this emerging journalistic practice. The study has undertaken a qualitative and exploratory approach into understanding how and why immersive technology is integrated into the news reporting practices of Al-Arabiya, Sky News Arabia, and Al-Sharq. Central to this investigation is the application of visual content analysis, where 18 videos—6 from each channel—have been meticulously examined. This methodological choice has enabled a deep dive into the narratives constructed through immersive technologies, shedding light on their added value in enhancing news delivery. By dissecting these videos, this research seeks to uncover the underlying motivations driving the adoption of such technologies in Pan-Arab newsrooms, thereby addressing the fundamental question of why immersive technology is being leveraged within this specific context. Complementing the visual content analysis, this study has incorporated insights from interviews with 20 professionals drawn from the selected news channels and experts in the field of immersive journalism. These interviews serve as invaluable sources of qualitative data, offering perspectives from practitioners and journalists intimately involved in the production and implementation of immersive technologies. Through these conversations, the research explores the opportunities that immersive technology presents for news reporting, as well as the challenges and considerations that newsrooms must navigate in their adoption and utilization. As an exploratory qualitative study, the methodology underscores its commitment to delving into the nuances of immersive journalism within the Pan-Arab context. It acknowledges the dynamic interplay between technology and storytelling, aiming to unpack how newsrooms harness immersive tools to enrich their narratives. This approach is particularly pertinent in addressing the overarching research questions: the rationale behind adopting immersive technology, its perceived benefits in the news industry, the emerging opportunities it creates, and the obstacles it confronts. Thematic analysis enabled

the researcher to generate a nuanced understanding of the opportunities and challenges presented by VR and immersive formats. The resulting themes helped clarify the complex relationship between both technology and narrative, in today's media landscape. Moreover, the methodological framework adopted in this research serves as a robust foundation for generating rich, context-specific insights that contribute to the broader discourse on immersive journalism. By combining visual content analysis with in-depth interviews, the study not only elucidates the current landscape but also offers nuanced perspectives on the future trajectory of immersive technologies in Pan-Arab newsrooms. In conclusion, this chapter underscores the significance of qualitative exploration in unravelling the complexities surrounding immersive technology in journalism. It affirms the relevance of such an approach in uncovering the motivations, challenges, and strategic implications associated with its adoption. Ultimately, this research aims to provide a comprehensive understanding of how Pan-Arab newsrooms are integrating immersive technologies to innovate news reporting and reshape the narratives that define contemporary journalism. Hence, the following chapters provide an analysis of the selected videos and interviews as well.

Chapter 6: Video Analysis

6.1 Introduction

This chapter provides an in-depth analysis of the collected videos. As a qualitative study, thematic analysis is applied as an approach "to investigate meaning rather than to quantify" (Donley and Grauerholz, 2012, p. 51). It is ideal for highlighting how immersive technology is utilized in pan-Arab newsrooms. Thematic analysis is "a method for identifying, analysing, and reporting patterns (themes) within data. It minimally organises and describes the collected data set in (rich) detail" (Braun and Clarke, 2006, p. 6). It also applies to interviews or transcripts (Caulfield, 2019) which will be explained and analysed in the following chapter. The researcher closely examines the data to identify common themes – topics, ideas, and patterns of meaning that come up repeatedly" (ibid, 2019). It primarily offers an arranged list of codes that the researcher intends to use in order to recognize and categorize certain patterns presented in the data collected. This approach is crucial because it provides a clear and visible framework for the analysis of the data, which is necessary in order to maintain consistency and reliability in the coding process. The collected data will not be interpreted using numerical or statistical methods, as is typical in quantitative research. Instead, qualitative content analysis provides a structured approach to understanding the influence of immersive technology on journalistic reporting. It offers a systematic framework for examining the content produced by newsrooms. (Tandoc and Lee, 2017). "Growth in immersive journalism, involving virtual, augmented, and mixed reality technologies and 360° videos, has increased debate on whether such technologies can significantly transform the journalistic field" (Wu, 2023, p. 387). The incorporation of immersive technologies in Arab newsrooms is an important phase in the field of contemporary journalism, yet there exists a conspicuous void in the knowledge of the rationale and framework behind this adoption. This research is aimed at bridging this gap, by delving into the complexities of the why and how immersive technologies are being adopted by the Arab news outlets into their news reporting. Arab media organizations are gradually realizing how virtual reality (VR) and augmented reality (AR) can be utilized to improve their storytelling. Nevertheless, without further exploration of the actual motivations and strategies behind this integration, the extant literature remains deficient. This research gap completion is aimed at providing valuable insights into the factors driving the adoption of immersive technologies in Arab newsrooms. Comprehending why Arab media outlets are adopting immersive technologies calls for a profound investigation of diverse contextual factors such as

technology infrastructure and industry custom. This thesis utilizes a holistic research strategy, aided by qualitative methods, including interviews and content analysis, to unravel the intricate interplay of the outlined factors. It also adds to a better understanding of the impact of immersive journalism on the Arab media. This dissertation aims to be a source of inspiration for scholars, practitioners, and players in the field who seek an overview of the changing face of Arab journalism in the digital era. By addressing critical research lacunae and providing a comprehensive analysis of the integration of immersive technologies in Arab newsrooms, this research contributes to a more nuanced understanding of the changing dynamics of news production in the Arab world. In conclusion, this research aims to delve into what is behind the use of immersive technology in Arab newsrooms. Investigating meaning through content analysis aligns with this objective by focusing on the underlying themes and narratives that emerge from the videos rather than merely counting occurrences of specific elements. This qualitative approach is essential for this research due to the following reasons:

1. Understanding context and nuance

The thematic analysis allows us to delve into the context and nuances of how immersive technologies are employed. For instance, it helps to uncover why certain visual technologies are used in specific ways, what kind of stories they are used to tell, and how journalists perceive their role in this new media landscape. By investigating meaning, there is a way to identify the motivations, intentions, and implications behind the use of these technologies, which is crucial for a comprehensive understanding of their impact.

2. Revealing patterns and themes

Through thematic analysis, recurring patterns and themes that signify how immersive technologies influence journalism practices can be identified. These might include themes such as "enhanced storytelling," "technical challenges," and "ethical considerations." These themes provide insight into how journalists and newsrooms are adapting to new technologies and what challenges and opportunities they face.

3. Capturing the role of journalists within immersive technology`s integration

Qualitative analysis emphasizes the human experience and subjective perspectives. In the context of this study, this means capturing how journalists experience the integration of

immersive technologies and how they adapt their practices. This human-centric approach provides a richer, more detailed understanding than quantitative methods.

4. Examining the role of technology

By investigating meaning, there is a way to examine the symbolic and functional roles of immersive technologies, such as how they contribute to the credibility and storytelling capacity of news content. Understanding these dynamics is key to analysing the broader implications of technology in journalism.

Investigating meaning through content analysis is essential for your thesis as it allows for a deep exploration of how immersive technologies are utilized in pan-Arab newsrooms. By focusing on meaning, your research can provide valuable insights into the evolving landscape of journalism and the transformative role of immersive technologies.

The following sections are represented as 6.2, which indicates the adopted theoretical framework regarding ANT and how this theory is used to analyse the videos (See Chapter 4 for more details), 6.3, which provides the coding scheme of the analysis, and 6.4, which illustrates the actual analysis of the videos.

6.2 ANT as a theoretical framework for content analysis

> *"Actor-network theory (ANT) is a sociological approach to the world that treats social phenomena as network effects. This approach focuses on the evolution of interactions within networks over time and is useful for studying situations of change, unsettled groups, and evolving practices such as current developments in the world of journalism" (Wiard, 2019).*

To analyse the adoption and implementation of immersive technologies, Actor-Network Theory (ANT) is employed. ANT allows researchers to examine the interplay between various actors (both human and non-human) within the network of video production and dissemination (Bencherki, 2017). This analytical framework is applied to a sample of 18 videos from three different news channels, with six videos from each channel. ANT contributes to filling the research gap by offering a robust methodology for examining the complex interactions between human actors (journalists, editors) and non-human actors (technologies, devices) involved in the production of immersive content. By mapping these networks, ANT helps to uncover how

these elements coalesce to shape journalistic practices and content delivery. This research contributes to the academic discourse by bridging the gap between theoretical understanding and practical application of immersive technologies in journalism. It aims to provide valuable insights that can inform future studies and guide media organizations in effectively integrating these technologies into their operations, ultimately advancing the field of journalism in the Arab world. By utilizing ANT, the study not only highlights the socio-technical dynamics of news production but also offers a nuanced perspective on the roles and relationships that drive the adoption of immersive technologies in journalism. For this Ph.D. study, Actor-Network Theory (ANT) will be effectively employed to conduct a thorough content analysis of videos, providing valuable insights into the integration of immersive technologies in Arab newsrooms. These steps are put into a sequence which includes defining the research objective, selecting the videos, identifying actors, mapping the interactions, analysing the content using ANT principles, coding using thematic analysis, and interpretation (Latour, 2007; Callon, 1984). (See Chapter 4 for more details about the adopted theoretical framework). ANT would provide an understanding of these linkages inside the newsroom. This theory could be one of the approaches, "we as journalism scholars might begin to build our conceptual understanding of these new forms of journalism" (Mabrook and Singer, 2019, p. 2098). The use of ANT in immersive journalism helps direct continuing research into the points at which technology progress and news reporting collide (ibid, 2019). In their study, they applied ANT to provide sufficient answers to the discussion below as they pointed out:

> *"What role does the nature of immersive video technology play in decisions about story topics, content, production, and dissemination? To what extent do human producers and consumers shape their decisions to align with technological affordances? Are particular skills or areas of expertise being foregrounded because of these affordances; if so, how are the various human actors responding?" (ibid, p. 2100).*

This research is an exploratory study, as Chapter 5 (Methodology) indicates. This approach "explores and investigates a problem that is not clearly defined" (Hasa, 2021). Therefore, applying ANT will provide an exploration of the whole network. This study provides an understanding of the mutual relationships between technology as an entity and other entities.

6.3 Coding scheme

This study employs a coding scheme designed to investigate the utilization of immersive technology within Arab newsrooms and to gain a deeper understanding of the journalistic practices associated with such visual technology. The coding scheme used in this study is designed to systematically analyse various aspects of immersive technology integration in Arab newsrooms. This includes examining how these technologies are incorporated into news reporting processes, the types of content produced using immersive technology, and the impact of such technology on storytelling techniques. By following a coding scheme, this study aims to categorize and analyse the data of news stories (18 videos) focusing on specific aspects related to the utilization of immersive technology. This approach allows researchers to identify patterns, themes, and trends within the data, providing insights into the strategies and practices employed by Arab newsrooms when using immersive technology. Furthermore, the study seeks to gain a better understanding of the journalistic practices associated with the use of immersive technology. This includes exploring how journalists utilize these technologies to enhance storytelling and convey complex information in new ways. By examining the journalistic practices surrounding immersive technology, researchers can identify best practices, challenges, and opportunities for innovation within Arab newsrooms. Overall, this study aims to contribute to the growing body of literature on immersive journalism and the integration of immersive technology in news reporting, particularly within the context of Arab media. Through systematic analysis and examination of journalistic practices, it seeks to provide valuable insights into the role of immersive technology in shaping contemporary journalism practices and experiences in the Arab world. Accordingly, this study follows a systematic coding scheme in order to respond to the research questions on page 71.

Hence, the analysis process is split into two levels., the researcher elaborated on these two levels regarding the adopted coding scheme as follows:

6.3.1 Level One: Provided details of the selected video sample

This thesis video sample consists of 18 videos uploaded on YouTube from three prominent Arab news channels: Al-Arabia, Sky News Arabia, and Al-Sharq. YouTube is considered “the largest multimedia search engine and sharing platform worldwide, allows users to upload, view, and rate videos” (Ching-Jung, 2023, p. 4). Each channel contributed 6 videos to the sample, resulting in a balanced representation across sources. The sample covers a time period

of one year, from June 1, 2022, when the researcher began the data collection process, until May 30, 2023. This timeframe provides a comprehensive view of the utilization of immersive technology within Arab newsrooms over the course of a year. The selection criteria for the videos in the sample were based on two main variables:

1- The first variable was the diversity of topics covered by the selected videos. It was essential to include a range of topics to ensure the sample represented the breadth of news coverage typically found in Arab newsrooms. This diversity allows for a comprehensive analysis of how immersive technology is integrated across different subject matters (Djamasbi et al., 2018). Hence, the sample for this study includes 18 videos covering a variety of news topics. Specifically, there are 2 videos focused on politics, 2 on economics, 2 on technology, 2 on human interest, and 4 on military affairs. Additionally, 3 videos cover both politics and economics, while there is 1 video on sports, 1 on religion, and 1 on science. This diverse selection of videos ensures a broad representation of different news categories within the analysis.
2- The second variable considered in the selection process was the variation in the types of immersive technology used in the videos, including augmented reality (AR), virtual reality (VR), and mixed reality (MR) (Ardèvol-Abreu and Túñez-López, 2019). This ensured that the sample encompassed a wide range of immersive technologies, allowing for a thorough examination of each different technology and its applications in news reporting.

By including videos that vary in both topic and technology used, the sample provides a rich dataset for analysis. It allows for insights into how different news channels incorporate immersive technology into their reporting across various subject matters, as well as the different ways in which AR, VR, and MR are utilized to enhance storytelling (Hopkins et al., 2019). The inclusion of videos from Al-Arabia, Sky News Arabia, and Al-Sharq ensures a diverse representation of Arab news media. These channels are among the most prominent and widely watched news outlets in the Arab world, making them ideal candidates for studying the integration of immersive technology in news reporting. Analysing videos from multiple channels also allows for comparisons between different approaches to immersive journalism. For example, researchers can explore differences in the types of immersive content offered by each channel, as well as variations in storytelling techniques and strategies (Kennedy and Engebretsen, 2020). Furthermore, the one-year timeframe of the sample provides insights into the evolution of immersive technology within Arab newsrooms over time. By examining

videos from June 2022 to May 2023, researchers can identify trends, changes, and advancements in the use of immersive technology, as well as any emerging best practices or challenges faced by news organizations (Rettberg, 2020).

According to Figure 6-1, the first level provides detailed information about the selected video sample through three axes: "topic identification," "utilised technology," and "news story description." It is worth mentioning that the full transcripts for the 18 videos are provided (See Videos Transcripts in Appendix).

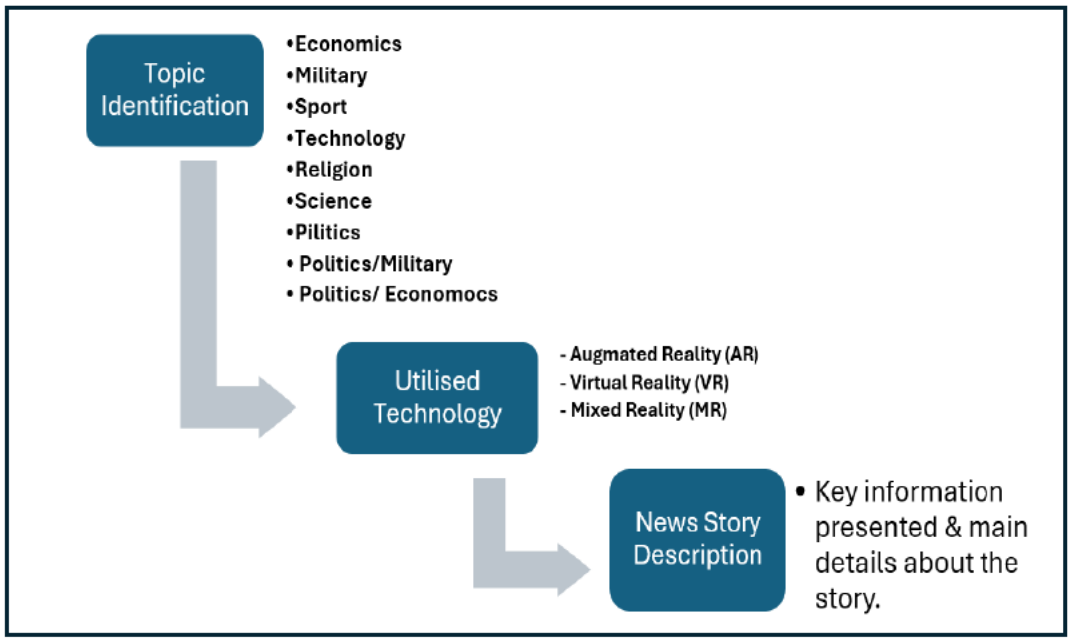


Figure 6-1: Level One: Provided details of the selected video sample

According to the information presented in Table 6-1, we can see how the video sample (18 videos) is classified. The first column shows the video codes as Al-Arabiya channel was identified by the letter A, and its sample consisted of six videos designated as A1 through A6. Likewise, the Sky News Arabia channel was represented by the letter B, and its sample also comprised six videos labelled from B1 to B6. Finally, the Al-Sharq Channel was assigned the letter C, and its sample included six videos labelled C1 through C6. The second column shows each video title that is already associated with the mentioned codes. This convenient identification process makes it easier to refer to the videos.

Videos' Codes	Title	Topic Identification	Utilised Technology	*First Publishing Date*
A1	In a Wondrous Way, China's Plan to Control the Spratly Islands	Politics/ Economics	*AR*	*Dec 24, 2022*
A2	Midterm Elections: What Has Biden Done for the American People?	Politics	*VR*	*Nov 8, 2022*
A3	The story of Western weapons that failed in Ukraine facing the Russian attacks	Military	*AR*	*Jan 20, 2023*
A4	It's Not Luck: A Dangerous Trick Behind Saudi Arabia's Wining Over Argentina	Sports	*MR*	*Nov 25, 2022*
A5	How does Iron Dome work, and how effective is it?	Military	*MR*	*Aug 28, 2022*
A6	The first moments of a devastating earthquake	Human-Interest	*VR*	*Feb 12, 2023*
B1	Being in two places at the same time. It's the world of the metaverse. Is it verifiable?	Technology	*AR*	*Jun 7, 2022*
B2	"Artificial Intelligence". Will it contribute to improving the lives of humanity?	Technology	*AR*	*Jun 7, 2022*
B3	Hajj is obligatory… Main rituals	Religion	*VR*	*Jul 5, 2022*
B4	Facts of the Beirut Port Explosion in Virtual Reality	Human-Interest	*VR*	*Aug 4, 2022*
B5	Queen Elizabeth… One queen and 15 prime ministers	Politics	*MR*	*Sep 9, 2022*
B6	Ukraine crisis redraws the world energy map	Economics	*MR*	*Feb 22, 2023*
C1	The danger of unexploded ordnance	Military	*VR*	*Jun 1, 2022*
C2	One belt… One way	Economics	*VR*	*Dec 8, 2022*
C3	Sudan... The humanitarian situation in danger of bullets	Military	*MR*	*April 25, 2023*
C4	Al-Nahda Dam… A third filling strains the atmosphere	Politics/ Economics	*AR*	*Aug 12, 2022*
C5	The Russian invasion of Ukraine... China's position	Politics/ Economics	*AR*	*Jan 24, 2023*
C6	How is the UN's response to the earthquake in Syria?	Science	*MR*	*Feb 14, 2023*

Table 6-1: Videos' codes, titles, topics, and technologies

Table 6-1 further provides the initial publication date for each of the 18 videos in the video sample. In addition to listing the "topic identification" and "utilised technology" for each video as follows:

1. Topic Identification:

The researcher identifies the topics covered in the selected news stories, which encompass a wide range of subjects relevant to Arab news reporting. These topics include politics, economics, military affairs, technology, science, human-interest stories, sports, and religion,

depending on the content of the sample. Many scholars adopted topic identification in their studies and/or indicated this classification. Hence, politics focuses on elections, government policies, or diplomatic relations (Al-Najjar, 2018), while economics includes reports on markets, trade agreements, or economic indicators (Ayyoub and Hatem, 2020). Military topics include conflicts, security issues, or defence strategies, while technology and science news cover innovations, scientific research, technological innovations, and advancements (Elkholy and Mostafa, 2018). Human-interest stories may highlight individual experiences, social issues, or cultural events. Sports news includes events, competitions, or athlete profiles (Abdalla and Salah, 2019). Finally, religion-related news may encompass religious events, rituals, or societal debates. It is worth noting that some stories may encompass multiple areas, combining more than one topic. However, In a study of Euronews, Vindenes and Gynnild (2020, p. 31) employed a classical classification for their study topics. The researcher employed the same classification for this category to sort news stories into distinct topics. Political subjects include elections, protests, international relations, government policies, political crises, and diplomatic conflicts. Military topics encompass armies, war equipment, and military conflicts. Sports topics revolve around players, sports teams, championships, global races, competitions, and prominent sports figures. Technology topics cover scientific advancements in hardware and software that impact people's daily lives. Also, in journalism, a human-interest story is a type of feature story that highlights people or pets in an emotional manner (Hughes, 1980). Human-interest stories aim to present individuals and their problems, concerns, or achievements in a way that encourages interest, empathy, or motivation among the readers or viewers (ibid, 1980). Seemingly, the researcher considers human-interest topics to include news stories about people facing conflicts, wars, natural disasters, and other dangers. The topic of religion encompasses religious practices such as prayers and fasting. Religion topic focuses on covering religious rituals as a defining aspect of religion. Concerning science topics, they deal with various journalistic stories that address news from a purely scientific perspective.

2. Utilised technology

The researcher provides details about the type of technology utilized for each video, which enhances the analysis of the role of immersive technology in storytelling. This category focuses on identifying the specific immersive technologies employed in each news story. Regarding RQ1: What thematic trends/ patterns have been applied via immersive technologies in pan-Arab newsrooms' reporting?, scholars who defined immersive journalism indicated that IJ is

“an experiential approach that allows users to experience and subsequently becomes immersed in, stories created not in the real world but in a virtual, augmented, or mixed reality” (Gynnild et al., 2020, p. 2). They have also indicated that this kind of journalism implies the use of technologies like virtual reality (VR), augmented reality (AR), and 360-degree video, while mixing these various technologies together is called cross-reality (ibid, 2020, p. 2). Goutier et al., (2021) discussed some immersive productions during some interviews they made, indicating some of the mentioned technologies; VR and 360-degree video. Another study made by Mabrook and Singer (2019b) discussed the same classification. In their research, Ikonen and Uskali (2020) focused on the role of AR technology storytelling in journalism. Based on all of that, and according to RQ1, the researcher derived the second category “Utilized Technology” dividing it into 3 subcategories: AR, VR, and MR. By documenting the use of immersive technology, the researcher can examine how these technologies are integrated into news reporting and their impact on the storytelling process. For example, some news stories may utilize AR overlays to enhance visualizations of data or geographical locations, providing viewers with interactive and informative experiences. VR may be used to immerse audiences in 360-degree environments, allowing them to explore scenes or events from different perspectives. MR technology, combining elements of AR and VR, may offer even more immersive and interactive storytelling possibilities by blending virtual and real-world elements. (See Chapter 3). This allows for a nuanced understanding of how immersive technology enhances storytelling practices.

3. News story description:

This contributes to providing a concise descriptive summary of each video, capturing the essential details about the news stories quickly and effectively. It typically a brief glance offers a comprehensive understanding of the event or issue being reported. These 18 videos are categorized according to the topic identification discussed on pages 107 and 108.

Politics: This category includes 2 videos as follows:

A2

This video discusses what the Democratic Party in the United States is promoting about the achievements of the American President Jo Biden leading up to the midterm elections. Specifically, it delves into the Biden administration's handling of the Coronavirus pandemic and its subsequent economic repercussions, including inflation and unemployment rates.

Moreover, the video highlights the approval of several significant laws by Congress, amounting to hundreds of billions of dollars. These include the Electronic Chips and Science Act, the Climate and Health Act, the economic stimulus plan, and the Infrastructure Rebuilding Plan. The video also reviews some of the most prominent challenges represented by the Russian competitor during the era of President Vladimir Putin, and what was posed by the war launched by Russia against Ukraine. The video reviewed a personal aspect of President Biden's life, as it mentioned some tragic events within his family, such as the death of his ex-wife and their daughter in a car accident, and the death of his son Beau due to cancer.

B5

This video delves into the names of 15 prime ministers who resided with the late Queen Elizabeth II of Britain during her more than 70-year reign. This news story highlights the major events that took place during the term of each Prime Minister, beginning with Winston Churchill and concluding with Lise Strass.

Economics: This category includes 2 videos as follows:

B6

This video indicates how the Russian-Ukrainian war contributed to redrawing the energy map in the world, dealing with the change in energy prices due to war. It delves into the impact of the Russian-Ukrainian conflict on the global energy industry. This video illustrates changes in energy prices and supplies between Europe and Russia, examining the implications of rising gas and oil prices, as well as energy security worldwide. Additionally, it explores the field of clean energy and the investments being made in this area.

C2

This video discusses the Belt and Road Initiative, which was reintroduced by Chinese President Xi Jinping. This initiative aims to connect China to Europe through the Middle East. The video focuses on the economic significance of this initiative and takes the presenter on a virtual journey through the geographical routes of this strategic road. The presenter reviews the land and water corridors to facilitate the transportation of Chinese goods across Asia, Britain, and Europe. The road has a total of transit countries reaching a level of sixty-six countries. The video also sheds light on the impact of Chinese infrastructure investments.

Military: This category includes 4 videos as follows:

A3

This video reviews some of the weapons with which the West supported Ukraine in the face of Russia's attacks, but these weapons failed in confronting the Russian attack. The video deals with Howitzers, which operate among other artillery equipment in a group called the battery. The video also addresses Air Support Aircraft, as it also failed to be used on the front line against the Russian army, which possesses modern air defences. On the other hand, the video reviewed the effective weapons of the Russian side, such as Lancet Suicide Drones, which provide Moscow with the ability to find and strike moving targets, such as The M142 HIMARS missiles.

A5

This video reviewed the Israeli Iron Dome system and its effectiveness. It discussed the system's importance and objectives, the company that manufactures it, and the most prominent features of its missile battery. The video also reviewed the system's most prominent defects related to its coverage scope and cost, which made Israel work on more economical solutions such as the laser system.

C1

This video is about the ongoing danger of unexploded ordnance in Ukraine, highlighting the risks posed by unexploded munitions, traps, and mines left behind after the war, and the lengthy process required to safely dispose of them.

C3

This video does not discuss a weapon or a military system but rather a well-known type of war called guerrilla warfare. The background of this video is based on the ongoing war between the Sudanese army and the Rapid Support Forces. The video explains in a quick historical review the beginning of guerrilla warfare in the nineteenth century when it was known as small wars, and how this type of war turned into one of the specific specialties in modern military science. The video addresses the role of both regular armies and armed groups in these wars, by reviewing what the military leadership on both sides resorts to on the battlefield, explaining

the details related to military plans, maintaining supply routes, the objectives of military manoeuvres, and the power factors on each side.

Technology: This category includes 2 videos as follows:

B1

This video discusses the world of the Metaverse, a concept that combines real and virtual realities. The video indicates that the term metaverse goes back to the American novelist *Neal Stephenson*. In his novel *Snow Crash,* he imagined Virtual characters meet in 3D buildings and other virtual work environments. The video explains how this technology can allow users to visit virtual environments to accomplish tasks more easily.

B2

This video focuses on artificial intelligence and its potential to improve human life. The video explains what AI is and how robots are a critical component of this field. Robots have already been used in delicate colon surgeries and have potential uses in education, monitoring air pollution, and controlling energy emissions.

Science: This category includes only 1 video as follows:

C6

This video discusses earthquakes as a geological science subject and demonstrates how serious earthquakes are, how they happen, how they are formed, and how they differ from aftershocks. This video appears to offer comprehensive information about earthquakes and their consequences. However, this journalistic information was released concurrently with the earthquake that rocked northwest Syria and southern Turkey.

Human-Interest: This category includes 2 videos as follows:

A6

This video captures the harrowing aftermath of a devastating earthquake that struck southern Turkey and northwestern Syria. The video starts by discussing the moments leading up to the earthquake. It then goes on to illustrate the initial moments of destruction caused by the earthquake, including the tremors that led to the collapse of homes and infrastructure. The

video also showcases a second aftershock that resulted in even more destruction and unfortunately, loss of life. The video provides examples of other earthquakes that caused similar devastation, such as the ones that occurred in Chile, Haiti, and California, resulting in the loss of both human lives and material possessions.

B4

This video captures the time of the explosion at the Beirut Port and discusses the aftermath's humanitarian implications. The explosion's intensity is comparable to a 3.0 Richter earthquake. In the video, one of the several instances in which a bride perished is the murder of her before her wedding. It goes on to discuss the tangible damages done to the medical industry, such as the devastation of clinics, ambulances, and hospitals. It also tackles the devastation of repressive silos and infrastructure, which account for over half of Lebanon's strategic reserves. The causes for this explosion, the government's official stance, and the investigative steps are then covered in the video.

Sport: This category includes only 1 video as follows:

A4

This video discusses the strategy that the Saudi national team used to overcome the Argentine national team during the World Cup, which was played at Qatar's Lusail Stadium. All goals scored by each side are included in the video. Although the Argentine national team is superior to the Saudi national team in terms of the ability to retain the ball, the video explains how the Saudi national team used offside as a method to achieve its historical winning. Argentina missed roughly ten goals as a result of the Saudi team's offside trap. This video presents a sports news story that is considered soft news.

Religion: This category includes only 1 video as follows:

B3

This video deals with a religious topic related to the Muslim obligation of Hajj. The video reviews how to perform the rituals of this main religious obligation among Muslims through its four basic pillars, which are Ihram, standing at Arafat, Tawaf al-Ifadah, and Sa’i between Safa and Marwa. Muslims are familiar with these Islamic terms. These terms are Islamic ones that Muslims are familiar with.

Politics/ Economics: This category includes 3 videos as follows:

As indicated in the “topic identification” section, news stories often cover numerous topics at once, such as politics and economics, politics and military, or military and human interest. Hence, some stories cover multiple topics at once. This happens, for example, when a political crisis erupts, which hurts the economy (politics/economics). Another example is when a news report discusses a military war, it emphasizes the substantial effect it has on individuals and their families (military /human-interest). This category includes 2 videos that reflect politics/ economics topics:

A1

This video explains the competition between China and several other nations regarding the Spratly Islands. The video provides an overview of the different approaches adopted by China to assert its authority over this group of islands, which have crucial political, economic, and strategic significance. Additionally, it delves into how China reacts to the moves made by its competitors in the area, showcasing its keenness to broaden its reach and assets in preparation for any opposition.

C4

This video delves into the ongoing crisis surrounding the Al-Nahda Dam. Ethiopia is constructing and filling the dam with water, which has led to growing tensions in both Egypt and Sudan. The video highlights some key data points related to the filling operations, storage capacity (measured in cubic meters), and percentage of completion for the dam's construction. According to the video, while the construction itself has raised concerns in Cairo and Khartoum over fears of affecting both countries' water share, Ethiopia is looking to leverage the hydroelectric power generation project that the dam will provide. The video also takes a closer look at the size of Ethiopia's electricity production in megawatts, which will receive a significant boost from the completion of this hydroelectric project.

C5

This video explores China's stance on the Russian-Ukrainian war from both political and economic perspectives. The video explores official statements that determine China's approach toward the conflict. It also delves into the military and economic partnerships between Moscow and Beijing, as well as the Chinese economic aid to Russia. Additionally, the video examines the American position on China's involvement in the war. Finally, the video discusses China's efforts to maintain neutrality amidst Western responses.

Level 1 of the investigation involved analysing selected videos to create concise summaries that capture the essential aspects of the news stories. These summaries provide a quick yet comprehensive understanding of the content, helping researchers identify key themes, patterns, and trends in large datasets. This approach streamlines the analysis process, allowing for a more efficient and nuanced understanding of the news, and aids in identifying subtle differences across stories. By focusing on essential points, the method also supports thematic analysis, uncovering underlying narratives and offering deeper insights. Ultimately, this method enhances the quality of media research by ensuring important themes and patterns are effectively analysed.

The statistical data in Table 6-2 below indicates that the selected news channels (Al-Arabiya, Sky News Arabia, and Al-Sharq) integrated 3 types of technology within the video sample of 18 videos covering various topics. These technologies included augmented reality (AR), virtual reality (VR), and mixed reality (MR). These technologies (See Chapter 3 for further details about their nature and utilisation) included augmented reality (AR), virtual reality (VR), and mixed reality (MR). These technologies were integrated into newsrooms to produce news stories covering various topics as the utilisation of this visual aid was not restricted to a specific topic. According to Mabrook and Singer`s study (2019), newsrooms are increasingly experimenting with immersive storytelling tools, including virtual reality. They indicated that “the resulting pieces have been wide-ranging in topic” (ibid, 2019, p. 2096). But the questions show up around how these technologies are being utilised in journalistic practice and what are the implications of using such technologies. Level one of the analysis process provided details about the selected video sample while the following section, level two, provides a qualitative content analysis, highlighting further detail and discussion of themes emerging from the selected videos, acquiring a deep understanding of the role of immersive technology in Arab newsrooms in light with the research questions.

	Topics								
	Politics	Military	Sports	Economics	Religion	Science	Human-Interest	Politics/ Economics	Technology
Number of Videos	2	4	1	2	1	1	2	3	2

	Technology		
	AR	VR	MR
Number of Videos	6	6	6

Table 6-2: Statistical data about the integration of visual aid (technology and topics)

6.3.2 Level Two: Qualitative Content Analysis & ANT application

This level follows a qualitative content analysis that is to be "done by classifying material as instances of the categories of a coding frame" (Schreier, 2012, p. 1). The researcher conducts a qualitative content analysis of selected videos, coding the material based on predefined categories and deriving themes related to immersive technology's integration and its impact on journalism. A coding frame, developed from the study's research questions and objectives, is used to categorize the material (Kennedy and Engebretsen, 2020). The researcher systematically analyses the news stories, categorizing them according to the predefined categories, and derives themes that address the research questions about immersive technology in Arab newsrooms. These themes provide insights into the benefits of such technology in news reporting (Ardèvol-Abreu and Túñez-López, 2019). This analysis uncovers patterns, trends, and challenges related to the integration of immersive technology in journalistic practices (Hopkins et al., 2019). Applying qualitative content analysis (QCA) is significant at this level. Mayring (2000) states that QCA is a method of analysing and interpreting textual material, such as words, phrases, pictures, and videos, without the use of numbers or quantitative

analysis. The thematic analysis approach is applied in this study, which is a technique that aims to find, examine, and derive codes, patterns, or themes from the video sample (Caulfield, 2019).

In this section, I address themes and sub-themes emerging from the videos. In order to generate a thematic map, I followed a six-phase process provided by (Braun and Clarke, 2006). According to ANT, the first phase includes watching the 18 videos several times to become familiar with the content. This contributes to noting how immersive technology is used by taking detailed notes on the interactions between human and non-human actors. For example, this phase helps to note how journalists use VR technology to enhance storytelling and how presenters interact with this content. This also includes transcribing the videos and re-reading the scripts. The second phase indicates generating initial themes. Themes entail "the most basic segment, or element, of the raw data or information that can be accessed meaningfully regarding the phenomenon" (Boyatzis, 1998, p. 63). I determined all of the sub-themes that were developed from videos in the third phase. These sub-themes highlight the added value of incorporating immersive technology into the narrative by examining its use. I have refined the whole thematic map in phases four and five by making sure that the whole video sample is related to the main themes and sub-themes. Writing the analysis is a part of phase six, and it is represented in the following section. Using Actor-Network Theory (ANT) for video analysis is quite beneficial and supports the following phases indicated by Braun and Clarke.

ANT helps understand the networks of human and non-human actors involved in integrating visual technology in newsrooms, highlighting the roles of journalists, editors, and technologies (Plesner, 2009). It challenges the focus on human agency by emphasizing the influence of technology in Arab newsrooms. Through ANT, video analysis reveals how technologies shape practices and interactions, with the concept of translation (Callon, 1984). showing how visual technologies like AR, VR, and MR are introduced and adopted. This approach uncovers relationships between actors and contextualizes technology adoption within newsroom practices. The thematic map below (Figure 6-2) on page 118 illustrates themes analysed through Braun and Clarke's six-phase process and ANT. This thematic map indicates theme/ sub-themes that have been illustrated through Braun`s and Clarke's six-phase process and ANT. This thematic map is derived systematically by studying how immersive technology was incorporated into the final production of the 18 videos. (See page 88 for more information about how these themes/ subthemes were generated).

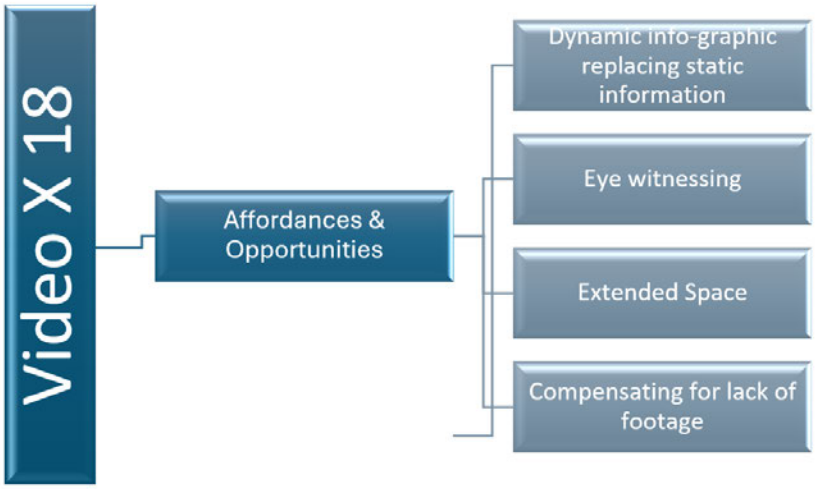


Figure 6-2: Thematic map

ANT is valued in developing a coding scheme that reflects on understanding how the adoption of immersive technologies is reshaping journalism practices. ANT "offers a way to interrogate the nature of this technology as a journalistic device, as well as the agency of diverse actors involved in its production" (Mabrook and Singer, 2019, p. 2097). Moreover, ANT "is perhaps best known for eradicating theoretical distinctions between humans and non-humans" (ibid, 2019, p. 2099). According to ANT, every relevant element is an actor with some degree of agency (Latour, 2007). For example, various immersive video formats need distinct viewing devices, which range greatly in terms of price, level of engagement, and experience quality. While high-end interactive VR needs advanced (and pricey) equipment, 360° videos may be seen on a computer screen or a smartphone (Lelyveld, 2015). As a result, technology functions as an agent that directly influences the goods produced and used by other agents, like users or journalists (Mabrook and Singer, 2019, p. 2099). Figure 6-3 on page 119 indicates networks among all these actors. Through "Translation", researchers can trace all these networks, focusing on how journalists navigate the affordances and opportunities offered by immersive technologies and negotiate ethical considerations inherent in their use.

Figure 6-3: Human and Non-Human actors within the selected newsrooms

6.4 Video Analysis (Themes & Sub-Themes)

Through the ANT lens, I examine how journalists navigate the complexities of immersive storytelling, negotiate ethical dilemmas, and leverage the capabilities of emerging technologies. Accordingly, ANT was applied to generate one main theme: "affordances and opportunities." (See Figure 6-2 on page 118).

6.4.1 Theme: Affordances and Opportunities

Ross (2022) considered that a “new generation of practitioners focused on the affordances and opportunities that VR can offer to storytelling” (p. 248). This shift in focus reflects a growing recognition of immersive technology's potential to revolutionize how stories are told and experienced. Rather than simply viewing VR as a novelty or gimmick, these practitioners see it as a powerful tool for immersive and engaging storytelling (ibid, 2022)This theme simply illustrates what function immersive technology adds to a news story. In other words, it indicates the added value of using such technology in terms of how news stories are narrated. The video sample derived many affordances and opportunities.

As explained prior, In ANT, the concept of “translation” refers to the process through which actors (both human and non-human) negotiate and align their interests, capabilities, and meanings to form a network that enables action (Latour, 2007). Latour describes “translation” as a crucial mechanism in constructing socio-technical networks. In the context of immersive journalism and technology development, “translation” becomes particularly relevant as journalists and technology developers navigate the affordances and opportunities offered by immersive technologies such as virtual reality (VR), augmented reality (AR), and mixed reality (MR) to enhance storytelling. When discussing the role of “translation” within the theme of "affordances and opportunities," it's important to consider how actors within the network of immersive journalism negotiate and align their interests and capabilities to leverage the unique features of immersive technologies for journalistic purposes. This negotiation involves not only human actors, such as journalists and technology developers but also non-human actors, such as the technologies themselves. In the context of immersive journalism, “translation” moments occur when journalists collaborate with technology developers to explore and exploit the capabilities of VR, AR, and MR technologies in storytelling (ibid, 2007). These moments involve the negotiation of meanings, capabilities, and constraints inherent in both the technologies and the journalistic practices (ibid, 2007). For example, journalists may work closely with developers to adapt immersive technologies to suit the specific needs of journalistic storytelling, considering factors such as narrative structure and ethical considerations. By mapping out the network of actors involved in the production and dissemination of immersive content, researchers can identify key “translation” moments where the interests and capabilities of journalists and technology developers intersect and align. This mapping allows researchers to understand the dynamics of collaboration and negotiation within the network and to analyse how these dynamics shape the development and use of immersive

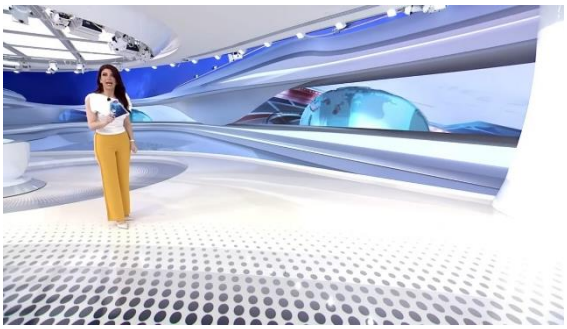
technologies in journalism. Accordingly, Figure 6-2 on page 118 shows the thematic map which elaborates on these affordances, which represent the derived sub-themes:

6.4.1.1 Sub-Theme 1: AR for Dynamic info-graphic replacing static information

AR is “the integration of digital information with the user's environment in real-time. Unlike virtual reality (VR), which creates a totally artificial environment” (Gillis, n.d.). Hence, AR allows virtual elements to be integrated into the real environment where the anchor presents the news story (See Chapter 3). In the following shots, AR was applied to add an illustration to the news stories, providing dynamic visual explanations rather than simple graphics. It is worth mentioning that I intend to indicate the affordances through the following analysis by providing examples from the video sample collected in my study.

A3 shots / Al-Arabiya

A3 video titled “The story of Western weapons that failed in Ukraine facing the Russian attacks” falls in 1:39 min. This video reviews some of the weapons with which the West supported Ukraine in the face of Russia's attacks, but these weapons failed in confronting the Russian attack. The video deals with Howitzers, which operate among other artillery equipment in a group called the battery. The video also addresses Air Support Aircraft, as it also failed to be used on the front line against the Russian army, which possesses modern air defences. On the other hand, the video reviewed the effective weapons of the Russian side, such as Lancet Suicide Drones, which provide Moscow with the ability to find and strike moving targets, such as The M142 HIMARS missiles. The video started without integrating any virtual objects (Shot 1 below). After that, the anchor started explaining about the Howitzers, which appeared alongside her presentation as indicated in shot 2.



Shot 1 – A3

Shot 2 – A3

Afterward, the anchor went on to explain another Western weapon, the Close Air Support Aircraft, which appeared alongside the presenter (Shot 3). Some other objects, such as soldiers, show up in the same shot on the floor, providing a military atmosphere to the story.

Shot 3 – A3

The anchor continued to explain the role of the Lancet-3 Suicide Drones, which also showed up alongside her flying in the studio, as in the Shot 4 below.

Shot 4- A3

After that, the anchor referred to the ability of these drones to hit moving targets. A military tank shows up on the floor (Shot 4). The Lancet-3 fired the tank as shot 5 and shot 6 indicate. It is clear from these shots, that AR has been used by integrating virtual elements in the real environment which is the actual studio.

Shot 5 – A3

Shot 6 – A3

The use of AR created an interaction between anchors and virtual elements which are not static information nor ordinary graphic illustrations but rather three-dimensional models that appeared as tangible objects in the studio. The representation of complex information in a graphical format has semiotic and aesthetic value, as it privileges one aspect of reality related to the knowledge regime (Kennedy and Engebretsen, 2020). It suggests that the knowledge regimes being privileged are those associated with visual representation and data visualization. Knowledge regimes refer to the dominant systems of knowledge production and dissemination that shape our understanding of the world (Flyverbom et al., 2016). In this context, the use of immersive technology to represent complex information visually highlights specific aspects of reality, thereby privileging certain knowledge regimes over others. The theoretical reference point to anchor this lies in the concept of knowledge regimes as proposed by Kennedy and Engebretsen (2020). According to their perspective, knowledge regimes encompass the dominant ways in which knowledge is produced, circulated, and legitimized within a given context. By privileging one aspect of reality through graphical representation, the statement suggests that the use of immersive technology reinforces specific knowledge regimes associated with visual communication and data visualization. This emphasizes the value of representing complex information graphically, suggesting that it has semiotic and aesthetic value. Semiotics refers to the study of signs and symbols and their interpretation, indicating that graphical representation conveys meaning beyond the literal content (ibid, 2020). The aesthetic value suggests that the visual presentation of information is not only functional but also pleasing or engaging to the audience. Moreover, the statement suggests that immersive technology facilitates the understanding of news by presenting it visually (Rettberg, 2020). This emphasis on visual representation privileges knowledge regimes that prioritize visual communication as a means of understanding and disseminating information. It suggests that visual representations are considered more effective or authoritative in conveying complex information compared to textual or verbal formats. Furthermore, the use of dynamic visual elements in immersive journalism reinforces the impression of comprehensive knowledge and indicates that the information presented is trustworthy and dependable (Tal and Wansink, 2016). This suggests that knowledge regimes privileging visual representations and dynamic data visualization are perceived as more credible and authoritative. The dynamic nature of visual elements implies a level of interactivity and engagement that enhances the perceived reliability of the presented information. However, the effectiveness of data visualization in immersive journalism also depends on the audience's faith in such data, particularly in an age of information overload, where people are constantly bombarded with news and information

from various sources (Rettberg, 2020). This highlights the importance of considering the broader context within which knowledge is produced and circulated, acknowledging the potential for scepticism or mistrust regarding visual representations of data.

To conclude, immersive technology here is used as an effective way to facilitate the process of understanding news by presenting it visually (ibid, 2020). Furthermore, the dynamic nature of the visual elements reinforces the impression of comprehensive knowledge and indicates that the information presented is trustworthy and dependable (Tal and Wansink, 2016). It is important to note that the effectiveness of data visualization in immersive journalism also depends on our faith in such data, which is particularly relevant in today's age of information overload, where people are constantly bombarded with news and information from various sources (Rettberg, 2020). However, In Actor-Network Theory (ANT), translation refers to the process of transforming and transferring meaning between different actors or elements in a network (Latour, 2007). In the context of ANT theory, translation within Augmented Reality (AR) can be understood as the way in which digital information is integrated into a real environment in real time, creating a seamless interaction between the virtual and physical worlds. When applying AR to news stories, the concept of translation can be seen in how virtual elements, such as illustrations or dynamic info graphics, are used to enhance and explain the content more engagingly and interactively. By anchoring these virtual elements within the real environment where the news story is being presented, AR facilitates the translation of information in a way that goes beyond simple graphics or static visuals. This integration of digital information through AR allows for dynamic and visually rich content, offering visual explanations that are more engaging. The affordances of modern visual technology in AR enable the translation of static information into dynamic infographics, making news stories more interactive and informative.

6.4.1.2 Sub-Theme 2: VR for Eye Witnessing

While AR perceives a real-world environment integrating virtual elements superimposed on it, VR recreates completely artificial scenes. VR allows the creation of a completely virtual digital environment (Tremosa, 2023). “VR experiences are located at the fully virtual extreme of the virtuality continuum” (ibid, 2023). In this case, anchors do not show up in a real environment (shots of A3 video on pages 121 and 122) but in a new, completely virtual place (See Chapter 3). The following two examples explain how VR technology is utilized, then the researcher connects this utilization with eye witnessing purpose.

B4 shots / Sky News Arabia

These shots were captured from B4 video titled “Facts of the Beirut Port Explosion in Virtual Reality”. This video captures the time of the explosion at the Beirut Port and discusses the aftermath's humanitarian implications. The explosion's intensity is comparable to a 3.0 Richter earthquake. In the video, one of the several instances in which a bride perished is the murder of her before her wedding. It goes on to discuss the tangible damages done to the medical industry, such as the devastation of clinics, ambulances, and hospitals. It also tackles the devastation of repressive silos and infrastructure, which account for over half of Lebanon's strategic reserves. The causes for this explosion, the government's official stance, and the investigative steps are then covered in the video. In B4 video which falls in 3:33 min, the anchor is fully involved in various virtual environments. In this video, she moved between different places as she appeared in front of the port that burned and then exploded, documenting the most prominent tragedy of a non-nuclear explosion, as in Shot 7 below:

Shot 7 – B4

Then, the anchor moved to downtown Beirut (Shot 8) where the video referred to the consequences of the port explosion, where the ambulance also appeared behind the anchor, in a message that reflects the presence of civilian victims of this explosion.

Shot 8 – B4

Shot 9 below represents a poignant moment in media storytelling, where the anchor immersed herself into a virtual environment to convey the personal tragedy of Sahar, a victim of the explosion. The anchor not only reported on Sahar's story but also visually connected with her narrative by appearing in Sahar's room, where her wedding dress was prominently displayed. This visual cue served as a powerful symbol of Sahar's interrupted life, as she and her fiancé had been eagerly preparing for their upcoming marriage before the tragic incident took her life while on duty. Virtual environments in media reporting allow anchors to transcend traditional boundaries of storytelling by immersing themselves. Using such virtual environments not only enhances the emotional resonance of the news story but also underscores the evolving nature of media presentation. It enables anchors to humanize the news by depicting the personal stories behind the headlines, thereby fostering a deeper understanding and empathy among audiences.

Shot 9 – B4

Looking at Shot 9, the anchor takes on the role of an eyewitness to the tragic events that befell a recently married couple in the wake of the explosion in Beirut Port. In order to enhance the narrative and grant the human element a legitimate place in the news story, B4 sought to include an eyewitness component. The anchor covered other angles as an eyewitness. When the explosion happened, the anchor approached the street (Shot 8 on page 125), which was close to the port of Beirut. Behind her, the city of Beirut was devastated, and buildings and hospitals were damaged as emergency vehicles raced to the scene. Thus, the anchor assumes the position of someone who witnessed the explosion which happened on 4th August 2021 firsthand. She was not there at the explosion site. However, the anchor was able to practically appear as an eyewitness because of advancements in virtual reality technology.

A6 shots / Al-Arabiya

This video captures the harrowing aftermath of a devastating earthquake that struck southern Turkey and northwestern Syria. The video which falls in 2:27 min starts by discussing

the moments leading up to the earthquake. It then goes on to illustrate the initial moments of destruction caused by the earthquake, including the tremors that led to the collapse of homes and infrastructure. The video also showcases a second aftershock that resulted in even more destruction and unfortunately, loss of life. A6 begins with a scene of the anchor (Shot 10) overlooking one of the Turkish regions hit by the earthquake prior to its occurrence.

Shot 10 – A6

The camera then moves to one of the main ways in the city, where the anchor is absent (Shot 11). As the earthquake occurs and hits a building and a car (Shot 12) below, the anchor shows up again reflecting her role as an eyewitness to this horrific event. The earthquake spread to hit the entire region (Shots 13 and 14). The video comes to an end in the same spot where the anchor started. Exactly from the same place overlooking the Turkish region, but the background of the place shows the extent of the devastation that befell the city, as the comparison appears in the following two shots 15 and 16.

Shot 11 – A6

Shot 12 – A6

Shot 13- A6

Shot 14 - A6

Shot 15 – A6

Shot 16 – A6

According to these examples captured from the mentioned videos (B4 and A6), different scenes were completely reconstructed, as the anchors dealt with new virtual environments. It is impossible to go back in time and film the moments just before and meanwhile the earthquake in Turkey or the explosion in Beirut. Therefore, VR technology was used to simulate those moments, making the anchors provide information as if they were witnessing the moments before and meanwhile these horrific disasters. The anchors lived through the earthquake and the explosion. They witnessed how buildings were destroyed resulting in human and material losses. They appeared to react showing anticipation and astonishment at the appearance of destruction. VR technology has opened up a whole new world for the eyewitness journalist, who is used to reporting from the scene and recording everything with their camera while elucidating the events and their sequence. With the use of VR technology, journalists can virtually recreate the scenario and create an entirely virtual environment in which they can engage as though they were eyewitnesses of the incidents recording all of their details.

The concept of "eye witnessing" experienced an evolution "as a journalistic keyword. It argues that three dimensions have helped establish "eyewitnessing" as a way to understand journalism" (Zelizer, 2007, p. 408). Zelizer indicated these dimensions as the eyewitness as report, role, and technology. Furthermore, "these dimensions have functioned as different carriers of meaning about journalism over time… establishing a seemingly consensual understanding of journalism and journalistic practice" (ibid, p. 408). "Eye witnessing's viability as a keyword today rests on a curious combination of technology and nonconventional journalistic presence" (ibid, p. 421). Therefore, technology has contributed to displaying news content in a different way, taking advantage of the development of technology and the new visual elements provided by this technology, such as virtual reality. In journalism, information from eyewitnesses and participants lends immediacy to the story (Rich, 2003). Moreover,

human sources are necessary in news reporting for the narrative to be believable and accessible (Busà, 2014)

In VR, the anchor presents the news story not from the middle of the actual event, but through a virtual place. In this case, anchors are narrating the news or news stories as eyewitnesses, even though in reality they were not. Since they did not go to the location of the event, nor did they see the details of the event closely, but rather within a completely new virtual environment, delivering the feeling that the broadcasters or presenters were there. Intermediate virtual environments are practically at the heart of immersive journalism, as they leave a feeling of presence, and in VR stories they provide an interactive environment to provide an element of response to the surrounding circumstances (Kukkakorpi and Pantti, 2021). VR technology creates "a sense of presence among users" (Goutier et al., 2021). But, according to the news stories that the researcher deals with from the three selected channels, the element of interaction lies between the presenter and the virtual environment, within a new or developed concept of the eyewitness. ""eyewitnessing" remains a central keyword for understanding contemporary journalism" (Zelizer, 2007, p. 424). However, VR contributes to including a new shape of "eyewitnessing" taking advantage of the new storytelling style by utilising immersive technologies such as VR.

Usually, the question arises on the rationale behind newsrooms' use of technology such as VR to produce stories. Providing an eyewitnessing element to the story is one major answer to the question. Using virtual visual material is significant in this case because there are multiple reasons to solve issues and obstacles in accessing the original material. The most obvious of these factors is being unable to attend the event or occasion due to concerns about not getting official permission, the possibility of danger, the expense, and the lack of footage or footage are not available. To approximate reality and make sense of the news story, computer-generated reality innovations like VR are used.

In the context of ANT theory, the concept of translation can indeed enhance the process of eyewitnessing for journalists, especially when leveraging VR technology. Translation within ANT can be applied to enhance eye witnessing through the following:

1. Interpreting Virtual Information: In ANT, translation involves the interpretation of information within a network (Latour, 2007). When journalists use VR technology to witness events in a virtual environment, they interpret the visual and auditory

information presented to them. This interpretation is crucial for understanding the nuances of the events they are witnessing and for accurately reporting on them.

2. Mediation by Non-Human Actors: ANT emphasizes the role of non-human actors, such as technology, in mediating social interactions (Mabrook and Singer, 2019). VR technology serves as a mediator between journalists and the events they are witnessing, enabling them to immerse themselves in a virtual space. This mediation enhances eyewitnessing by providing journalists with a more immersive and detailed perspective on the events they are covering.
3. Formation of New Associations: Translation within ANT involves the formation of associations between various actors within a network (Callon, 1984). When journalists use VR technology for eyewitnessing, new associations are formed between the journalists, the virtual environment, and the events they are witnessing. These associations shape the journalists' understanding of the events and influence how they report on them.
4. Shifting Contexts: ANT acknowledges that meanings and relationships can change as actors move and interact within a network (ibid, 1984). VR technology allows journalists to shift their context from the physical world to a virtual one, altering the way they witness events. This shift in context can enhance eyewitnessing by providing journalists with access to events and environments that would otherwise be difficult or impossible to witness.
5. Negotiation of Power Dynamics: ANT also considers power dynamics within networks and how they influence interactions between actors (Latour, 2007). When journalists use VR technology for eyewitnessing, they must negotiate their relationship with the technology and consider how it shapes their perception of events. VR technology holds power in shaping the way events are portrayed and understood, and journalists must be mindful of this influence in their reporting.

By applying the concept of translation within ANT to the use of VR for eyewitnessing, journalists can enhance their understanding of events and gain access to new perspectives. This approach acknowledges the role of technology as a mediator in shaping the way journalists witness and report on the world around them.

6.4.1.3 Sub-Theme 3: MR for Extended Space

As AR is "the technology that overlays digital content on top of the real world" integrating visual elements, VR provides a completely virtual environment in "a creative imaginary experience" (OnQ Blog, 2022). While MR "brings the best of both AR and VR together by capturing the real world through a series of cameras and sensors " (ibid, 2022). MR technology as a techno-term is a "view of the physical world with an overlay of digital elements," which is the case in AR, but both "physical and digital elements can interact" (Tremosa, 2023). Applying this technology in newsrooms allows for the extension of a real studio so that other spaces are adjacent to the studio. So, as a newsroom's professional application, anchors within MR stories would appear in a combined visual-real environment. MR allows a scope of use in the newsroom that can create an expansive space. In this case, it is possible to increase the size of the studio virtually. Therefore, it can be said that this technology can overcome the limited capabilities related to space or the size of studios. The following example explains how MR technology is utilized for space extension.

C3 shots / Al-Sharq

This video discusses a well-known type of war called guerrilla warfare. The background of this video is based on the ongoing war between the Sudanese army and the Rapid Support Forces, which started in April 2022. This video, which falls in 2:57 min, sheds light on the impact of the conflict between the Rapid Support Forces and the official army. The video addresses the role of both regular armies and armed groups in these wars, by reviewing what the military leadership on both sides resorts to on the battlefield, explaining the details related to military plans, maintaining supply routes, the objectives of military manoeuvres, and the

Shot 17- C3

power factors on each side. MR was applied as the studio extended, showing a virtual battlefield of the studio. This virtual space was used to explain in a quick historical review the beginning of guerrilla warfare in the nineteenth century when it was known as small wars and how this type of war turned into one of the specific specialties in modern military science. Shot 17 below shows part of the battlefield and a military point where military vehicles and soldiers appear in the background, in addition to the stacked bags that are used for defensive cover. As explained, MR allows the capability to combine the actual environment with digital aspects and extend the studio.

In the context of discussing this war that broke out between the Rapid Support Forces and the Sudanese army, MR technology was used in an interview with one of the guests. The guest appeared within this virtual space on a virtual screen answering the anchor's questions in this live political interview (Shot 18). Therefore, this technology has overcome space challenges and logistical issues related to providing physical screens by replacing them with virtual ones within the same virtual space.

Shot 18- C3

In Actor-Network Theory (ANT), the concept of "translation" can be applied to understand how technological innovations like Mixed Reality (MR) technology are integrated and adopted in specific contexts such as newsrooms. MR technology is described as a tool that overlays digital elements onto the physical world, creating a mixed environment where virtual and real elements coexist. This description highlights its potential application in newsrooms to expand the physical limitations of studio spaces. "Translation" within ANT can be understood and applied to this context. ANT suggests that technologies act as intermediary objects that mediate interactions between various actors (human and non-human) within a network. In the case of

MR technology in newsrooms, it serves as an intermediary object that enables interactions between journalists, anchors, and the virtual studio environment. When MR technology is introduced into a newsroom, it "translates" between different actors by enrolling them into new relationships and roles. For example, journalists and anchors interact with MR technology differently than they would with traditional studio setups. The technology facilitates new practices and interactions, such as presenting news stories in a combined visual-real environment. MR blurs the boundary between the physical studio space and virtual environments. This blurring allows for the virtual expansion of the studio, overcoming physical constraints like limited space or studio size. ANT emphasizes that the success of technological adoption depends on aligning the interests and goals of various actors within a network (Latour, 2007). In the case of MR technology in newsrooms, its adoption and integration depend on how well it aligns with the goals of journalists (e.g., enhancing storytelling capabilities), and editors (e.g., improving visual presentation). Therefore, the introduction of MR technology into newsrooms within ANT involves understanding how it translates between different actors (journalists, anchors, etc) and facilitates new interactions and practices. It highlights the importance of aligning technological capabilities with organizational goals and overcoming traditional spatial limitations through virtual augmentation.

6.4.1.4 Sub-Theme 4: Compensating for the Lack of Footage

Media outlets might encounter significant challenges in sourcing adequate visual material to complement their news stories, influenced by several key factors. Firstly, the unavailability of videos can severely limit the ability of media organizations to visually depict events. This scarcity may result from inaccessible locations, where events occur in remote or hazardous areas that are difficult to reach for journalists and camera crews. Sometimes, factors like the existence of violence in a country or area may affect how challenging it is to get pictures due to security constraints. The media outlet must deal with the dilemma of keeping the original photos or recordings in addition to any worries about endangering the reporter by going to that place. Then, virtual reality and augmented reality technologies provide a means of resolving this problem. In other cases, technical limitations such as equipment failures or communication breakdowns can prevent the timely capture and transmission of visual content. Secondly, copyright issues present substantial barriers to the use of visual materials in news reporting. Media outlets must navigate a complex legal landscape to obtain the necessary rights for visual content, which can involve negotiating with copyright holders or obtaining licenses for footage.

This process can be time-consuming and expensive, particularly when dealing with exclusive or high-demand footage that requires specialized permissions or agreements. Thirdly, the publication of sensitive material poses ethical challenges for media outlets. Visual content depicting graphic violence, explicit scenes, or sensitive situations can provoke strong emotional responses from audiences and raise concerns about privacy, consent, and potential harm. Journalistic standards and ethical guidelines compel media professionals to carefully weigh the public interest in accessing information against the potential impact on individuals depicted in such visuals. Lastly, certain news stories, particularly those rooted in science or fiction, pose unique challenges for visual representation. Stories that involve complex scientific concepts, hypothetical scenarios, or speculative fiction often lack real-world visuals that can be captured or authenticated. In these cases, media outlets may resort to using illustrative graphics, animations, or conceptual artwork to visually convey concepts or narratives that are otherwise abstract or theoretical in nature. The challenges faced by media outlets in obtaining visual material for news stories underscore the complex interplay of technological, legal, ethical, and editorial considerations.

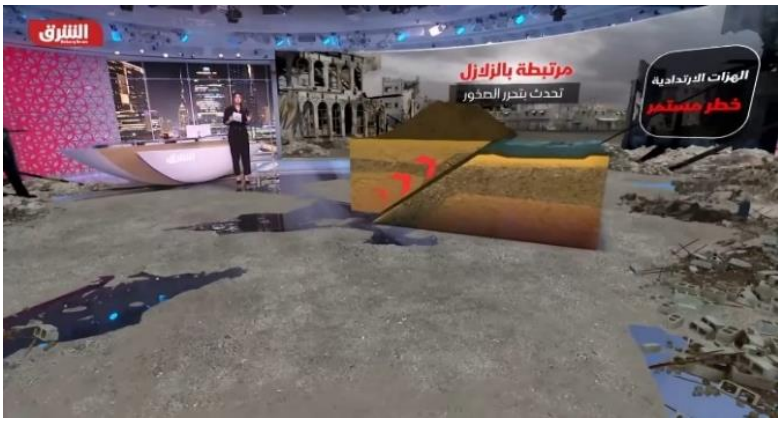
Media outlets applied immersive technology as a solution for overcoming this unavailability or shortage of visuality. This technology allows news outlets to reconstruct virtual news stories through either complete virtual material or partial virtual elements. As explained in Chapter 2, AR is a perspective on the actual world with a layer of virtual information superimposed on it. On the other hand, virtual and physical components may interact in MR, which combines the actual environment with digital aspects. As for VR, it reflects a completely immersive digital world. As such, the use of any of these patterns of technology is contingent upon the type of visual material to be generated. The following example indicates how VR compensates for the lack of footage.

C6 shots / Al-Sharq

This video which falls in 1:48 min discusses earthquakes as a geological science subject and demonstrates how serious earthquakes are, how they happen, how they are formed, and how they differ from aftershocks. This video appears to offer comprehensive information about earthquakes and their consequences. However, this journalistic information was released concurrently with the earthquake that rocked northwest Syria and southern Turkey. Hence, it is hard to provide factual visual information about in-depth scientific knowledge on earthquakes and their effects. In other words, how can you provide images of the Earth's layers

that actually explain these layers? Or, for another example, how an earthquake cause damage to the infrastructure that provides services such as electricity and water? VR or MR technology can contribute to overcoming the challenge of lack of footage as indicated in Shots 19 and 20 below.

Shot 19 – C6



Shot 20- C6

In other words, the researcher provides the original script of the video, then he intends to explain that as follows:

> *"Aftershocks occur after an earthquake, as rocks continue to break free from their position in the ground along the fault line or near the epicentre. Their seriousness is related to their continuity, so aftershocks usually continue after an earthquake and may last over days, weeks, or sometimes even years, in the movement of destructive earthquakes that occur in the near-surface crust of the Earth. Therefore, aftershocks accompany shallow earthquakes more than deep earthquakes, i.e., those with a depth of more than sixty kilometers. But over time, aftershocks wane and decrease in strength. This does not mean that preventive measures should not be taken if they occur, as tremors are able to complete what the earthquake began by toppling cracked buildings and destroying infrastructure, which poses a threat to the lives of residents and workers*

in the field of rescue operations after the earthquake. Predicting an earthquake or aftershock can be difficult. However modern science is trying to employ artificial intelligence that is capable of analysing large amounts of data captured from earthquake sensors around the world". (See Video Transcripts in Appendix).

The difficulty of locating genuine visual resources that effectively illustrate the intricacies of earthquake formation is a persistent challenge. This scarcity can impede individuals' comprehensive understanding of the processes involved. To address this gap, a specialized video leveraging Mixed Reality (MR) technology was meticulously crafted. By harnessing the power of MR, this video transcends traditional limitations, providing a detailed journey through the complexities of earthquake occurrence. Through dynamic visualization and advanced simulations, the video serves as a valuable tool, offering unparalleled insights into the dynamics and mechanisms underlying earthquakes. By bridging the gap between abstract concepts and tangible experiences, this innovative approach aims to enhance accessibility and comprehension, empowering viewers to grasp the fundamental principles governing seismic events with greater clarity and depth.

6.5 Conclusion

This thesis video sample consists of 18 videos from three prominent Arab news channels: Al-Arabia, Sky News Arabia, and Al-Sharq. This chapter includes an analysis of video content, revealing that immersive technology was primarily used in these outlets including three main patterns: Augmented Reality (AR), Virtual Reality (VR), and Mixed Reality (MR). The three types of immersive technology were utilised to deliver dynamic information rather than static data and to incorporate the element of visual entertainment into the news, creating what is often referred to as "infotainment". Infotainment is a term indicates the utilisation of "audiovisual techniques and production styles that emphasize dramatic structures, personalization, and human-interest approaches in television news stories" (Alencar and Kruikemeier, 2018, p. 1535). Furthermore, although the anchor or reporter is virtually present rather than physically in the field, this technology adds a layer of eye witnessing that influences the narrative of news stories. The concept of "eye witnessing" experienced an evolution "as a journalistic keyword" (Zelizer, 2007, p. 408). Hence, technology has contributed to displaying news content differently, taking advantage of the development of technology and the new visual elements provided by VR. Additionally, the use of immersive technology addresses the shortage of

visual content and helps overcome logistical challenges arising from resource limitations, such as the need for space. The analysis of the selected sample demonstrated that this new modern technology played an untraditional role in presenting journalistic stories. It is also indicated that this technology can be used without restriction to specific topics. The use of immersive technology did not impose its utilisation within a specific topic area, but rather there was a great deal of flexibility. Furthermore, it is explained that the availability of footage is one of the prominent challenges facing the production and dissemination of a journalistic story. The traditional method of presentation on television depends on delivering news accompanied by visual material. However, channels can use immersive technology such as VR to overcome the dilemma of footage lack and deliver news in such an unconventional presentation way. It is also pointed out that AR, VR, and MR techniques played a role in making news stories livelier, rather than adopting traditional presentation or using static data.

However, this technology was utilised to insert virtual elements or rebuild virtual environments, but it did not require the use of supporting media tools for an immersive viewing experience. Immersive technology hinges on the idea of sustaining the maximum degree of involvement or engagement, as extensively explored (See Chapter 3). Scholars indicate that immersive virtual worlds provide a special opportunity for giving people a first-person experience of news items (de la Peña et al., 2010). Moreover, they went into detail about how immersive technology provides participants with the impression of being immersed in a story. They illustrated that immersive reporting involves translating viewers' sense of location to an environment where a plausible activity is occurring that they see as really occurring and, most significantly, where their own bodies are directly implicated in this action (Gynnild et al., 2020). Scholars indicate that immersive journalism provides a fundamentally new approach to experiencing the news and, eventually, to comprehend it in a manner that would be otherwise impossible, short of actually being there (de la Peña et al., 2010, p. 299). Hence, immersion refers to the degree to which a user feels fully absorbed or engaged in a virtual or digital environment. Immersion is about creating a sense of presence or "being there" in a simulated or digital environment. This immersive watching cannot be achieved without using tools that provide an immersive viewing experience. The selected news stories in this study did not require applying any supportive devices. These devices such as VR glasses, headphones, HDMs, and Cardboards, offer an opportunity to enjoy an immersive experience in its best form. It will contribute to intensifying the visual viewing in terms of immersion that imparts vitality to the content. Hence, news stories in this study`s sample do not reflect any immersive watching

but remain as traditional viewing. In other words, in order to get fully immersed in a story, an immersive experience requires a “phones or a head-worn device, such as glasses or a headset”. (OnQ Blog, 2022). Since these devices were not provided, no such immersive viewing can be maintained. So, Arab channels used this modern visual technology for more infotainment purposes not reflecting in offering immersive experience for the audience. However, the use of immersive technology in journalism creates ethical questions that need to be carefully considered. According to Pérez-Seijo and López-García (2019, p. 954), immersive journalism “brings new ethical challenges because some practices and procedures go against conventional journalistic standards." These technologies raise concerns regarding accuracy, transparency, and the manipulation of visual narratives since they can obfuscate the distinction between reality and simulation. By ensuring that virtual representations correctly reflect the facts of the events being covered, journalists using immersive technology must traverse these ethical hurdles in order to preserve credibility and trust with viewers (ibid, 2019).

This chapter significantly contributes to understanding the affordances and challenges associated with the integration of immersive technologies in Arab newsrooms. It identifies how these technologies enable news channels to enhance the visual appeal of their content in a competitive media landscape. Moreover, it highlights the constraints and obstacles faced by journalists and news organizations in effectively harnessing these technologies to their full potential. Furthermore, the chapter plays a crucial role within the broader framework of the thesis by providing empirical evidence and concrete examples of immersive technology usage in practice. It bridges theoretical insights with practical applications, offering a grounded understanding of how immersive technologies are reshaping journalistic storytelling in the Arab context. This empirical foundation not only validates the theoretical frameworks employed but also enriches the thesis's overarching argument about the transformative impact of technology on journalism practices. It is noteworthy that despite the integration of immersive technology, the chapter clarifies that the selected news channels do not require specialized devices for viewing immersive content, signalling a distinction between using immersive technologies and achieving full immersive journalism. The video analysis chapter significantly advances our understanding of how Arab newsrooms navigate the complexities of immersive technology integration. In the next qualitative content analysis will also be applied to the 20 interviews conducted as part of this study. By using "The Bourdieu Field theory", the adopted approach may aid in gaining a thorough grasp of this field of research on the use of immersive technology in pan-Arab newsrooms.

Chapter 7: Interview Analysis

7.1 Introduction

This chapter contributes to the analysis process by drawing on Bourdieu's field theory and conducting in-depth interviews with 20 industry professionals to investigate the integration of immersive technology within Arab newsrooms, which influences journalistic practice. The sections below elaborate on this in more detail.

7.2 In-depth interviews

This study involves analysing interview transcripts drawn from interviews with 20 industry professionals from the selected news channels (Al-Arabiya, Sky News Arabia, and Al-Sharq), made up of four groups. These include the "News Desk" (editors, journalists, writers, reporters, producers), the "Creative Desk" (video graphic designers, video editors, visual technicians), and "General Managers & News Directors". The fourth group represents "Outside Experts", which includes senior professionals from the outside selected channels who are involved in news story scripting or visual content creation within the immersive journalism field. These interviews provide additional insights into the utilization of immersive technology and justify its integration within the industry. They also offer further explanations to enhance understanding of journalistic practices within immersive technology. Hence, interview analysis is crucial because it offers insight into the mindset of journalists who are actively involved in the adoption and implementation of these technologies. Interviews give researchers a unique opportunity to examine the perspectives, experiences, and challenges faced by the practitioners in the work. According to Patton (2015), this is one of the factors that contribute to the comprehensive understanding of contextual issues that lead to the uptake of technology.

7.3 Theoretical approach

Drawing on Pierre Bourdieu's field theory offers a robust theoretical framework for comprehensively analysing the integration of immersive technologies within the field of journalism, specifically within Pan-Arab newsrooms. Based on the research questions on page 71, this study seeks to elaborate on:

- How adopting immersive technology affects the principles of journalism (Doxa).
- How immersive technology use affects newsroom agents' work experiences (Habitus).
- How immersive technology use affects newsroom agents' skillsets (Capital).

According to the following themes and sub-themes, this research contributes to exploring the transformation in the journalistic field due to the utilisation of immersive technologies and to what extent.

7.4 Thematic map: "Affordances" and "Challenges"

It is indicated that "a new generation of practitioners have focused on the affordances and opportunities that VR can offer to storytelling" (Ross, 2022, p. 248). However, what regularly comes up – or could be seen as the main concern – is the question of "justification" of the integration of immersive technology and "how its additional, spatialized, audiovisual data can aid storytelling rather than provide surplus distraction" (ibid, 2022, p. 248). Hence, "Affordances" and "Challenges" in Figure 7-1 below are two main themes that the research questions intend to reflect on regarding the 20 interviews conducted in the study.

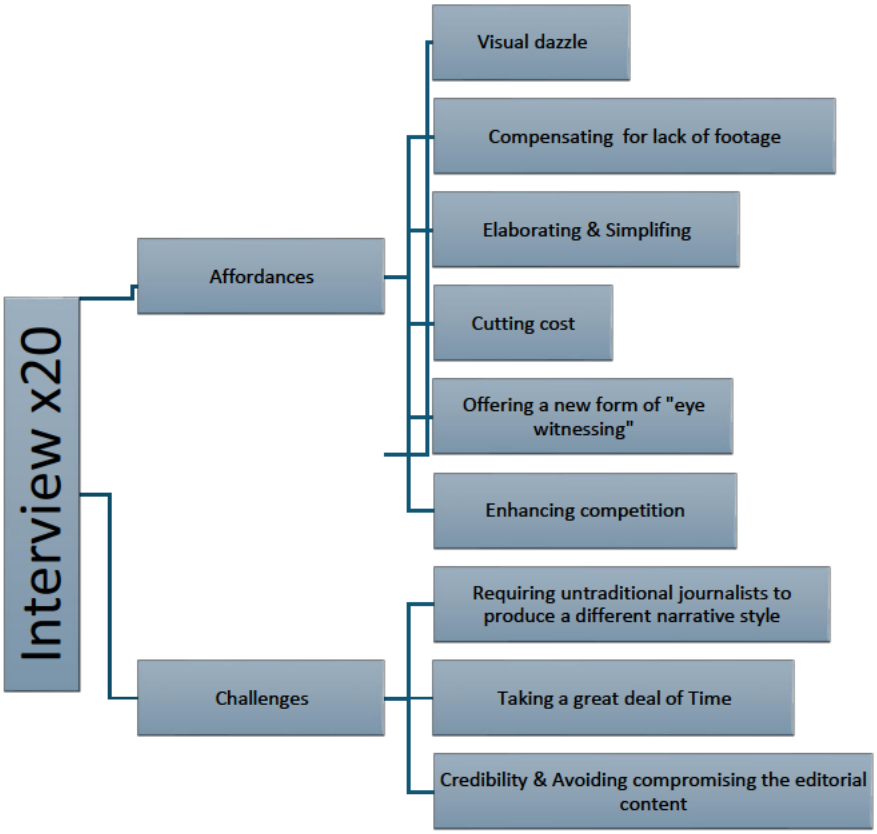


Figure7.1: Interview thematic map

7.5 Findings

Based on the interviews undertaken for this study, the researcher examined the participants' experiences to gain a deeper comprehension of the implications of implementing immersive

technologies in Arab newsrooms, as well as the advantages, opportunities, and technological affordances that these technologies offer. Additionally, the researcher aimed to identify the constraints and challenges that arise in the journalistic field or practice, and the ways in which the roles of agents within newsrooms change. The participants showed that there are specific affordances behind using immersive technology which are: visual dazzle, compensating for lack of footage, elaborating and simplifying, cutting costs, offering a new way of “eye witnessing”, and enhancing competition. The participants also demonstrated that "requiring a different narrative style," "taking a great deal of time," and "credibility & avoiding compromising the editorial content" are challenges that occur when integrating immersive technologies into newsrooms. Based on Bourdieu's field theory, all the mentioned themes and sub-themes can be explained thoroughly through the aspects: doxa, habitus, and capital as follows:

7.5.1 Impact on Principles (Doxa)

The interview analysis makes it evident that there are two primary areas of discussion when examining the effects of immersive technologies in Arab newsrooms: 1) the effect on news credibility, and 2) the evolving principle in journalism regarding the necessity of leveraging various formats and platforms to compete. These two main areas are discussed below:

7.5.1.1 The effect on news credibility

“In May 2007 the World Journalism Education Congress (2007) set out its declaration of principles; chief amongst these was the commitment to serving the public in an ethically informed manner” (Steel, 2009, p. 3). Principles of journalism are the cornerstone of ethics-laden and professional news reporting and ensure that journalists convey to the public accurate and unbiased information. Among the basic principles are truth, credibility, and accuracy (ibid, 2009). “Unlike fiction writers or storytellers, journalists are committed to a code of ethics, defined by the principles of truthfulness, accuracy, objectivity, impartiality and fairness in news reporting” (Busà, 2014, p. 33). Checking the facts and providing a background is the journalist's responsibility not to confuse the audience. This principle stresses the significance of adequate research and confirmation of facts so that any information provided is accurate, well-balanced, and credible. The integration of immersive might affect the credibility of news as one of the significant principles that has to be maintained. IVW19 sheds light on that:

> *IVW19: In my opinion, the heavy reliance on these new technologies in the media slightly reduces the credibility of news stories, because virtual reality is not reality after all. Every time there is reality and fantasy, we will find that reality triumphs over fantasy. Having the real footage is always better than the virtual one. It is true that taking the audience outside of reality is part of useful fantasy. However, news could be only a line on television and does not necessarily need a visual aid. This modern technology can be used when providing news-based knowledge is required. In other words, when a plane falls, the main news story is that it fell. When I want to discuss the possibility of planes falling, the most common types of planes that fall, and why they crashed, here the visual aid comes in and it becomes necessary to use in the early stages of news. (Former Managing News Editor, Group 4: Experts, 2023)*

It is worth considering the implications that accompany this technology integration on the news principles. IVW19 indicates that this technology might affect the journalistic practice negatively and impact the credibility of news. There are ethical considerations that regulate journalistic practices. Uskali and Ikonen, (2020) indicated that there is a need for further studies that focus on understanding how to implement immersive journalism without exceeding journalistic standards. They discussed that there are many claims for more regulations to ethically recognize utilizing immersive journalism, saying that "journalism ethical standards offer a valuable basis for immersive journalism practices, but…there is indeed a need for some updates and fine-tuning" (ibid, p. 54). In general, these claims represent an ethical commitment to news values such as accountability, credibility, and transparency" (ibid). Regarding the main role of journalists, "the central purpose of journalism is to provide citizens with accurate and reliable information they need to function in a free society" (Steel, 2009, p. 3). This is not an argument against the use of technology or contemporary visual aids in journalism; rather, it is about maintaining the norms, principles, and values of journalism, including trustworthiness and credibility.

Several key factors call for claiming that immersive technology could impact news credibility. To start with, these technologies can blur the line between reality and simulation, causing audiences to question the authenticity of the news content. VR and AR are reconstructions rather than direct representations, which can lead to scepticism about the accuracy of the information presented (Pavlik, 2019). This scepticism arises because these immersive experiences can blend real events with artificial elements, making it harder for

viewers to distinguish between factual reporting and simulated content. Moreover, the dramatic and immersive nature of these technologies often prioritizes entertainment over factual reporting. This can overshadow the actual news content, diverting attention from essential facts and reducing the perceived seriousness of the news. The overemphasis on visual dramatization can also detract from the critical elements of a news story, leading to a focus on spectacle rather than substance. Additionally, the use of these technologies introduces editorial choices about what to include and how to present it, potentially introducing biases. While VR and AR can enhance storytelling and provide deeper insights in certain contexts, their overuse or inappropriate application in news reporting can undermine the credibility of news stories by introducing elements of simulation, sensationalism, and potential bias. Ensuring the accurate and straightforward presentation of facts should remain the priority in news reporting, with advanced technologies used judiciously to enhance understanding without compromising journalistic integrity.

While modern technologies, including virtual reality, can be valuable tools in news reporting, their heavy reliance may slightly diminish the credibility of news stories. Real footage remains the gold standard for authenticity and trustworthiness in news reporting. However, there are instances where virtual reality can be effectively utilized to provide a deeper understanding of news-based knowledge. It is crucial for media professionals to strike a balance between incorporating new technologies and preserving the integrity of news reporting. The issue is that one of the dangers mentioned in the debate around immersive journalism is that this new technology for journalism may be viewed as a means of manipulating audiences, which would be contrary to the journalistic ideals of credibility (Johnson, 2020).

7.5.1.2 The evolving principle in journalism regarding the necessity of leveraging various formats and platforms to compete

Discussing shifting principles of journalism as this study referred to doxa, it is worth mentioning another impact of using immersive technology. It is about “the need for journalism to leverage on different formats and platforms to deliver the news” (Wu, 2023, p. 394). Some participants talked about how journalism's guiding ideas are changing. Journalism must use a variety of venues and media to disseminate its content. To stay competitive, news outlets must be creative and use new technologies. The adoption and implementation of immersive technology in journalism are increasingly influenced by the imperative for news organizations

to remain competitive in a rapidly evolving media landscape. As traditional news consumption habits change and digital platforms proliferate, there is growing pressure on news outlets to innovate and engage audiences through novel formats. This includes leveraging technologies such as immersive journalism to enhance storytelling and audience interaction (Boczkowski and Mitchelstein, 2013; Picard, 2006). The integration of immersive technologies is driven by the strategic necessity for news organizations to differentiate themselves in a crowded marketplace and attract digital-savvy audiences who increasingly expect more immersive and interactive content experiences. Therefore, newsrooms are motivated to embrace these technologies not only as a means of enhancing journalistic practices but also as a competitive strategy to maintain relevance and appeal in the face of market competition (Pavlik, 2019). A basic approach is no longer sufficient for news organizations; instead, they must innovate and use technology opportunities to transform the way stories are reported. In other words, "competition" becomes a core journalistic principle according to the participants. In order for news organisations to compete, they intend to make their news content more appealing and visually attractive. The participants indicated that immersive technology offers a "visual dazzle" content. The study's participants indicated that one of the goals for using AR, VR, and MR is to enhance visual luring. They confirmed the intention of drawing the audience into the news story through immersive technology. This approach makes the journalistic material more appealing because it deviates from the conventional presentation style. Jones indicated that popular outlets decided to enter – in addition to the gaming and computer industries - the world of journalism aiming to provide users with a new way of understanding news stories (Jones, 2020a, p. 37). Applying immersive technology in the news industry has created significant opportunities for journalists and the storytelling process (Shin and Biocca, 2018, p. 2801). Researchers found that "a new generation of practitioners have focused on the affordances and opportunities that VR can offer to storytelling" (Ross, 2022, p. 248). Most of the interviewees explained this idea, as this is clearly indicated in the following extracts:

> *IVW17: In the past, we presented news in a traditional way and the audience got used to it and became bored, but these techniques add an aesthetic aspect to the news content and present it in a more attractive way. I believe that this technology was an attraction for the public to watch the news. (Journalist, Group 1: News Desk, 2023)*

> *IVW2: Immersive technology has contributed to attracting audiences and increasing the demand for news content produced through virtual reality or augmented*

> *reality. Through the data we have, we found that those segments that are produced using immersive technology in one of our shows are the most viewed, and most interacted with on our channel's various social media accounts. (General Manager/ News Director, Group 3: Experts, 2023)*

Perhaps this is particularly evident in relatively new channels, compared to other channels. Al-Sharq Channel was launched in 2019, and it is new when compared to Al Jazeera, which was launched in 1996, or Al Arabiya, which was launched in 2003. Therefore, it needs a new and innovative method of presenting news that achieves visual dazzle, thus contributing to attracting the audience. There is an important point that should not be overlooked, which is that the public has built its loyalties based on the different editorial policies and political agendas in the various satellite channels, which means that there must be a new style of news presentation, which provides the opportunity for the new satellite channels to attract the masses. Accordingly, IVW3 one of the interviewees at Al-Sharq justified utilizing immersive technology as the below:

> *IVW3: We made an effort to invest in this technology to add an element of visual dazzle. Because we assumed that the audience would notice this element, and it would catch their attention, deciding to watch us as a new media outlet. So, this is a way to facilitate the delivery of content in a way that is impressive. (TV Presenter/ Journalist, Group 1: News Desk, 2023)*

"Visual dazzle" as is indicated in the respondents' extracts is a primary goal behind the use of immersive technologies. Visually striking content can capture and retain viewers' attention more effectively than traditional formats. This is crucial in a media landscape where audiences are bombarded with information and have short attention spans. It is clear that respondents highlight that High-impact visuals can create a more memorable experience. Hence, visual dazzle helps differentiate news outlets in a competitive market. By utilizing cutting-edge technologies like virtual reality (VR), augmented reality (AR), and advanced graphics, respondents identify that media organizations can set themselves apart from their competitors. It is reported in the transcripts that these technologies allow for innovative storytelling techniques that can present complex information in an accessible and captivating manner. This idea can lead to an example the researcher indicates, as interactive graphics can provide audiences with a deeper understanding of news stories, making the content not only more engaging but also more informative. Moreover, the researcher contributes to the same idea

indicating that visually impressive content can drive higher engagement metrics, such as clicks, shares, and time spent on a page. This is particularly important in the digital age, where metrics directly influence advertising revenue and funding. Media outlets that effectively use visual dazzle can attract larger audiences and increase their online presence, which in turn can lead to greater financial support (if news outlets are looking to maintain financial benefits via the advertising market) and sustainability for their operations. Therefore, news outlets look to attract viewers. There is a high percentage of viewers who are primarily interested in visual dazzle according to participants in the study. News outlets can attract them to the content they produce by providing an element of fascination. Hence, visual dazzle is a primary goal, that it related to the media market and competition. News channels are competing to occupy a more competitive advantage on the media map and the field of news service. News channels are used to competing in more than one direction, such as conducting exclusive interviews, racing to be the first to broadcast breaking news, who can provide comprehensive news coverage, obtaining news from reporters from the location of the event at the time it occurs, and many others. The ability to compete was another goal behind this technology integration. News channels believe they can compete because the new method of delivering the news departs from the traditional presenting manner, so the journalistic content is more enticing. This goal and "visual dazzle," are closely related. Put differently, the more visually appealing the journalistic information is, the more competitive it becomes. The use of virtual reality and augmented reality in news channels has been driven by the fact that there is a major challenge of competing among them. The market is full of news organizations that are similar in terms of role and format. Here, IVW3, points out a few informational backgrounds about this:

> *IVW3: The competitive market is enormous and unlike any market in the world. There is a market for specialized television news journalism, which are Arab news channels that broadcast 24 hours a day, 7 days a week. There are news channels directed to Arabs, of which there are an estimated 21 news channels, the majority of which are owned by non-Arabs and affiliated with foreign ministries. These projects arose after the events of September 11th prevailing a trend that reflects fear of Arabs. Thus, budgets were allocated, and this type of channel was launched, such as the American Al-Hurra channel, the Russian Russia Today channel, the French France 24, and other Arabic-speaking channels. Therefore, immersive technology was one of the tools that contribute to presenting TV content in a new form, so we can compete. (TV Presenter/ Journalist, Group 1: News Desk, 2023)*

If this was the case when Al-Sharq first appeared, it is also the case with Sky News Arabia, which debuted much later than Al Jazeera and Al Arabiya. One of the main objectives was to use contemporary technology in journalism practice, which would add something fresh to the news creation process and secure the organization's standing among Arab news channels. IVW11 made the following observation:

> *IVW11: In order for us to be competitive, we needed to comprehend, test, and learn more about this technology. In this regard, Sky News Arabia was a trailblazer since, at the time of purchase, no one had tried this technical system. (TV Presenter, Group 1: News Desk, 2023)*

According to the interviewees, competitiveness is a crucial objective. It can be understood that the factors that increase competition between television news channels include the previous sub-themes which are: trying to simplify and explain the news to the public, compensating for image deficiencies, presenting new technological concepts to eyewitnesses, and presenting visual dazzle. Put another way, the ability of newsrooms to compete in the news market is correlated with the use of immersive technology. This means that the opportunities, advantages, and benefits that come with using this technology will be reflected in the media outlet's capacity to produce unique news content that will allow it to stand out from the competition among news channels. The following extract reflects on this discussion:

> *IVW12: Virtual reality technology can be used in the context of dazzlement. Today's era is the era of technology. The entry of virtual reality technology into newsrooms has made media organizations compete in the field of dazzling viewers. Visual dazzle first attracts the viewer's eye, but not at the expense of written journalistic material, as there is information and text that are part of content marketing. The goal is to deliver content in a way that is attractive to the eye, but in some cases, the visual appeal may trump the content. (Journalist, Group 1: News Desk, 2023)*

Another issue brought up by this study participants was that using immersive technology in news report creation was not enough to keep up with the competition; it also needed to be applied in covering significant events. The US elections and the Russian-Ukrainian War are two examples of world events that garner a lot of attention. Immersive technology therefore played a major role in the news coverage of these events. This may be seen clearly from the extracts that follow:

> *IVW4: Immersive technology has been used so widely; that has reached the level of hyperbole. I believe that the reason lies in the competition between news channels, as each news organisation tries to showcase the best technologies, especially during major occasions, such as the American elections. (Journalist, Group 1: News Desk, 2023)*

> *IVW18: Our primary motivation for using immersive technology into our news reporting is always competition. Competition heightens the difficulty and forces us to generate journalism demonstrating our existence. This entails having the capacity to cover news stories like the US elections that we covered in 2016 and 2020 and to create content on news stories that garnered a lot of attention, like the conflict in Ukraine. In all of this, competition cannot be disregarded. (Creative Manager, Group 2: Creative Desk, 2023)*

Conversely, the participants indicated that while focusing heavily on contemporary technology at the expense of editorial content might improve the competitiveness of the visual production industry, it will also negatively impact the audience's ability to learn, comprehend the implications of the news, and gather details. IVW7 provides the following extract to clarify this:

> *IVW7: When technology is used merely for visual dazzle, it enters another space. That is, you are competing with other channels, not to provide better content to the audience, but in the direction of obtaining international awards that focus on the visual factor rather than the editorial one. (Journalist, Group 1: News Desk, 2023)*

I consider that the immersive technology sector is striving to meet the demands of the contemporary market. Any industry leader needs to be bold enough to embrace change and adapt along with it. Numerous businesses have collapsed because they were unwilling to adapt and evolve.

> *IVW20: One of the wealthiest corporations in terms of capital, Kodak is a photographic company that was doomed to fail because it failed to embrace the digital camera market. (Producer, Group 1: News Desk, 2023)*

This extract emphasizes how crucial it is for journalists to stay current with technology and use it in their journalistic practice since it guarantees continuity. Technology has influenced

news reporting and advanced in a variety of ways, whether it be through radio, newspapers, television, or online news. The media outlet's task is to make technological investments in order to strengthen its position in journalistic practice and carry out its duties towards the public. This implies that news content shouldn't be sacrificed in the process of integrating technology into news operations. It became evident from the interviews done for this study that this challenge is one of the biggest issues facing newsrooms that use mixed reality, augmented reality, and virtual reality to generate stories. Through the interviews, the participants saw that immersive technology might be used in a useful and professional way to support and highlight the content, provided that the implementation process is given enough time, the "visual dazzle" factor is not prioritised over the content, and the real visual material is not substituted with a virtual one. The participants shared their opinions regarding this use, noting that while it was warranted in some reports, it was not in others. Looking at the below extracts, this idea is illustrated with the given extracts:

> *IVW11: I find that sometimes, this technology has influenced the news at the expense of content. Attention should not be given to visuality at the expense of the content. In other reports, it was exactly the opposite. We produced material using VR about the Beirut port explosion, as the report was very professional. We conveyed the experience to the viewer in a professional manner. We did not rush the production process as time was not a pressure factor. The report was filmed and produced professionally. All of this contributed to conveying the content and the pain and tragedy it carries to the audience. (TV Presenter, Group 1: News Desk, 2023)*

> *IVW17: We have learned a rule that says: real video is not replaced by real video. However, in my practice, there are some cases in which this rule has been overlooked. And I can say there is always debate about this issue in the newsroom. (Journalist, Group 1: News Desk, 2023)*

Some other participants believe that the rivalry among TV channels has caused viewers to prioritise "visual dazzle" substantive content, with the goal of securing a spot by being the earliest and most advanced in utilising this technology. Instead of modifying VR technology to support content, satellite channels are now producing material that is appropriate for VR due to competition. The employment of these technologies has become overly dramatic. Visual dazzle should serve as a visual aid, not be the main focus of the narrative. Based on the responses given by the participants, it is likely that the visual dazzle component sometimes

takes precedence over the text. This kind of production here suffers from a serious flaw: it downplays the significance of the message while showcasing stunning visuals. However, based on Bourdieu's Field theory analysing of the participant's responses, the use of immersive technology to simplify and convey information, as well as to bring a new experience to the world of journalistic storytelling without negatively affecting the content itself, is a useful embodiment in the news industry. Using immersive technology as a visual aid can enhance the storytelling while avoiding compromising the editorial content.

7.5.2 Impact on Work Experiences (Habitus)

Wu (2023) noted that field experiences "accumulated by journalists over time influence the way they act and practice their craft" (p. 394). Participants identify three important aspects of how immersive technology brought into the journalism industry affect news professionals' work experiences. Participants emphasized that their work experience upon immersive integration included 1) Journalists` role within a new form of eye witnessing, 2) using immersive technology to compensate for the lack of footage, and 3) "the need to allocate enough time" (ibid, p. 395). These three main areas are discussed below:

7.5.2.1 Journalists` role within a new form of eye witnessing

From this study participants' responses, there is a set of circumstances that contributed to this change. The first case is associated with cost, as a specific budget may not be available to cover a specific event, whether this is a purely administrative decision or due to financial challenges. Hence, News organisations resort to using this technology. This factor was explained in the previous sub-theme, accompanied by some extracts from the participants. The second scenario relates to the security environment and the risk that a journalist in the field may encounter. Wars and other military conflicts are one instance of this. Numerous news outlets have admitted that a number of journalists have died or suffered injuries while reporting on conflicts. For instance, 24 journalists have been killed since 1st January 2024 (RSF, 2024). Moreover, it is also worth indicating what transpired with the Al Arabiya channel press team during the 2003 US invasion of Iraq, the loss of communication with the reporter and cameraman at Sky News Arabia during the 2013 coverage of Syria, or the martyrdom of Al Jazeera correspondent Sherine Abu Aqla during the Israeli army's incursions into the occupied West Bank cities in 2022. IVW5 explains that:

> *IVW5: When there's a risk and I can't get to the exact location of the incident, virtual or augmented reality comes in handy. Thus, the question is how I will tell the audience what I want to say and how I will deliver the information. My presence in the field is necessary to accomplish this purpose. Still, I cannot take the risk, or reach the place physically, so I utilise virtual reality to give the audience the impression that I am there and able to provide details and information about the event which will contribute to understanding the event better. (TV Presenter/ Journalist, Group 1: News Desk, 2023)*

War reporters' commitment to authenticity in their coverage is indeed integral to their professional identity and the ethos of renowned news organizations like the BBC and CNN. These reporters often place themselves in perilous situations to deliver firsthand, authentic accounts of conflict zones. This dedication is rooted in journalistic principles that prioritize on-the-ground reporting and eyewitness narratives, despite the inherent risks involved. However, the journalism tradition of witnessing, deeply rooted in the positivist Western tradition, emphasizes the role of the journalist as an objective observer who reports events as they unfold, aiming to provide a factual and unbiased account of reality. This approach is grounded in the belief that truth can be objectively observed and presented, reflecting the values of the Enlightenment and scientific inquiry. Over time, this tradition has become a global standard in journalism, with news organizations around the world adopting similar methods of reporting to ensure credibility and public trust. The practice of witnessing, where journalists act as neutral conveyors of information, is seen as foundational to maintaining the integrity of the profession. However, as media landscapes evolve with new technologies, the challenge remains to uphold the principles of this tradition while adapting to the dynamic nature of modern storytelling, such as through immersive or interactive formats.

The BBC, for instance, has long been recognized for its insistence on deploying correspondents to locations of significant news events, ensuring that their coverage is not only timely but also deeply informed by the immediate context and realities of the situation (Kamalipour and Snow, 2004). Similarly, CNN has built its reputation on the mantra of being first on the ground, exemplifying a commitment to authenticity through direct observation and immediate reporting from the scene (Flew et al., 2016). For war reporters, the act of taking such risks is not merely a job requirement but a fundamental aspect of their professional ethos, aimed at providing audiences with unfiltered, authentic insights into the complexities and human impacts of global conflicts. According to the SPJ Code of Ethics, “ethical journalism

treats sources, subjects, colleagues and members of the public as human beings deserving of respect" (SPJ, 2014). The difficulties in producing documentary video stories escalated along with the humanitarian crisis in Syria as an example of the hot spots and places of conflict, highlighting the benefits of virtual reality technology (Flatlandsmo and Gynnild, 2020, p. 64). VR technologies "minimize harm by not risking safety" (ibid 2020, p. 64). Regarding the Syria war, Malmo indicated that "thanks to the rapidly growing world of virtual reality technology, there is now a way to put people outside Syria on the ground in the middle of the war without risking their safety" (Malmo, 2014)

The third scenario concerns being unable to attend the event location due to issues with securing authorization and licenses to enter this location. A news story about the White House, which was produced by Al-Arabiya, serves as an illustration of this. There are barriers that make obtaining permission to shoot in the White House hallways extremely difficult, if not impossible. Trying to get approval, if at all feasible, may take a long time. The anchor presented his journalistic material as though he were at the White House at the time, and Al Arabiya channel created a news story in which the White House was virtually recreated. The following quote indicates that:

> *IVW5: There are other topics related to places we cannot reach or enter. In one of the reports, I wrote using virtual reality technology about the Oval Office in the White House, it is not an easy matter to enter the US President's office, photograph, sit at the President's desk, and talk about his diary, his problems, and the laws he passes to Congress. But with my colleagues' assistance, I was able to enter the Oval Office, bring the audience in with us, and inform them of the details using this technology. (TV Presenter/ Journalist, Group 1: News Desk, 2023)*

Eye witnessing has been a key component of journalists' reporting authority ever since they were first required to report on events that went beyond the everyday experiences of the public (Zelizer, 2007, p. 408). A growing number of media outlets have made eye witnessing their signature, and cutting-edge technologies have made it possible to report news in new and creative ways(ibid, 2007).

7.5.2.2 Using immersive technology to compensate for the lack of footage

The second aspect of the journalistic work experience has to do with making use of immersive technology to compensate for the shortage of footage. Media outlets may face the

problem of not having footage or enough visual material to accompany their news stories. This issue can arise due to various reasons such as the unavailability of videos, copyright issues that restrict their use or there could be sensitive material that is not convenient to publish. Additionally, sometimes the news story is entirely fictional, which makes it impossible to include any real visual content. The solution for overcoming this unavailability or shortage in visuality is to resort to immersive technology. This technology allows news outlets to reconstruct virtual news stories through either complete virtual material or partial virtual elements. As explained in Chapters 3 and 6, AR is perspective on the actual world with a layer of virtual information superimposed on it. On the other hand, virtual and physical components may interact in MR, which combines the actual environment with digital aspects. As for VR, it reflects a completely immersive digital world. As such, the use of any of these patterns of technology is contingent upon the type of visual material that is to be generated. According to the journalists, professionals and experts in the field of visual creativity involved in this study, there are a number of factors to take into account when trying to make up for the absence or unavailability of visual content. Augmented reality is employed when there are several elements in the visual material that has to be generated. Virtual reality and mixed reality are used instead, though, if the visual material that has to be created is a virtual world in which the broadcaster appears, either entirely or partially. Hence, according to the below extract, IVW14 explains how AR is utilised to compensate for footage shortage:

> *IVW14: We use augmented reality to help the audience see what the anchor is explaining when we want to enlighten them about a certain object. Let's take an example where Samsung is pushing a new phone model even if it hasn't been released yet. This indicates that the updated version of this phone is not represented in any authentic photos. But all it did was post details and summaries about the new phone model. Next, using the information supplied by the corporation, we gather all the pertinent elements, visualise them, and virtually build the new model of the phone. (Journalist, Group 1: News Desk, 2023)*

There are cases where a completely virtual environment needs to be reconstructed, and all the visual material must be compensated for, as both IVW14 and IVW7 explain:

> *IVW14: If, for example, you would like to discuss a nuclear reactor explosion that occurred somewhere in the past, you will not be able to travel back in time to that site because of the risks from radioactive emissions. Naturally, no real pictures exist that*

demonstrate the reactor's detonation. The news can be interpreted using immersive technology as if the presenter were actually experiencing the news and the nuclear facility disaster. Next, we look at virtual reality technologies. (Journalist, Group 1: News Desk, 2023)

IVW7: Certain stories might not allow access to picture or video content. Coronavirus is one instance of this. People were confused by the news and information being spread as the pandemic started. To illustrate how the infection spreads, we employed augmented and virtual reality technology. (Journalist, Group 1: News Desk, 2023)

Television news relies heavily on visual content to present news stories in an appealing way to viewers of all demographics. The interviewees suggest that many people are interested in following news beyond traditional formats, such as news anchoring accompanied by images. Consequently, news channels have been expanding their tools and mechanisms to present content in more advanced and attractive ways, even when there are no pictures or visual material available. IVW8 provides an example to illustrate this trend:

IVW8: When we talk about the composition of a missile, and there is no video of this missile from the inside, then we resort to virtual reality or augmented reality to provide material that is more useful in terms of information and an attractive and sophisticated option that compensates for the absence of the footage. (Managing News Editor, Group 3, 2023)

Sometimes, elements like the presence of conflict in a region or nation may have an impact on how difficult it is to get photos because of security restrictions. The media organisation may have concerns about putting the reporter at risk by visiting that location, and they also need to deal with the issue of retaining the original images or recordings. Then, the technology of virtual reality or augmented reality offers a way to address this issue. This is clarified by the quote that follows:

IVW20: The strategic significance of a certain city where battles between the two armies occur is emphasised in the Russian-Ukrainian War. This problem will be made simpler by AR and VR technologies, which will also provide the viewer with enough context to replace the original image. The Arab audience is familiar with Moscow or Kyiv, but they may not be familiar with Bakhmut, a Ukrainian city. Using this

contemporary technology, we explain Bakhmut's strategic significance to the Arab public. There have been some really intense skirmishes there, and the images that come from that region are few because of the security risks involved in getting in. (Journalist, Group 1: News Desk, 2023)

7.5.2.3 The need to allocate enough time

The third aspect of the journalistic work experience is the challenge of taking a great deal of time which professionals face while working on their content using immersive technology. According to a Knight Foundation's 2016 report on VR journalism, small and medium-sized news organisations are less likely to employ immersive technology since it takes time and effort to produce VR content ("VR_report_web.pdf,", 2016). A challenge expressed by study participants is time. They point out that creating a story using immersive technology requires time in three main directions. Figure 7.2 shows these directions as below:

Figure 7.2: Taking a great deal of time as a challenge.

The first direction is concerned with "story extraction". The newsroom obtains news items from multiple sources. For instance, they attain news through TV channel subscriptions with international agencies such as Reuters and AFP, or governmental agencies such as WAS in the Kingdom of Saudi Arabia and TAS in Russia. News sources also include correspondents in the field. Reporters also "use various types of sources to gather the information they need for their stories, and are expected to develop and cultivate sources as part of their profession" (Busà, 2014, p. 40). Journalists "draw information from a wide variety of written sources" as well (ibid, p. 40). This includes "trusted internet sites (e.g., national institutes of health, government sites)" and "mailing lists and newsgroups" (ibid, p. 40). There are many various forms of resources. Accordingly, as a result, choosing which stories to generate utilising immersive

technology from all these sources is a difficult task for journalists, and it takes a lot of time. IVW17 indicates that according to the following extract:

> *IVW17: It took time to look for news that applies to this type of production. Having enough time gives me the opportunity to read more news and information, and to conduct in-depth research into the details which is reflected in the quality and accuracy of the material. (Journalist, Group 1: News Desk, 2023)*

However, the editor-in-chief may make that decision in certain situations and designate journalists to work on VR or AR stories.

The second direction relates to “writing the story”. As we mentioned previously, writing this type of news requires imagination because journalists write based on what they imagine and not on what they watch in terms of footage. Therefore, the writing style in this context also needs time, so that they ensure that what they write is applicable and updated as well. These extracts indicate that:

> *IVW15: Time has been and still is a great challenge because the story depends on creativity in writing, especially since you do not have visual materials to rely on when writing. You're writing the story from scratch, and that takes a lot of time. (Senior Graphics Designer, Group 2, Creative Desk, 2023)*

> *IVW2: The time challenge clearly appears when you are forced to edit the writing due to rapid and sudden developments, especially if these developments occur before the screening time. (General Manager/ News Director, Group 3: Experts, 2023)*

The third direction relates to "coordination with the creative department." The researcher noted that the role of the creative department within news organizations, particularly in the context of immersive technology and visual content production, raises intriguing questions about professional identity and collaboration with journalists. Creative professionals in these departments often work closely with journalists to transform data and information into compelling visual narratives. While their work is crucial in enhancing the visual stories, their self-identification within the journalistic framework differs significantly. In traditional journalism, journalists typically oversee the selection of footage, editing, and recording of voiceovers to create coherent and impactful news reports. However, in immersive journalism, where technologies like VR require specialized skills and knowledge in visual storytelling, the

creative department assumes a pivotal role. They not only support journalists in executing their duties but also contribute valuable insights and visions on visually interpreting and presenting journalistic material. According to the participants` responses, they underscore the importance of the creative department's contributions to the overall news production in this collaborative process. Their expertise in visual communication, graphic design, animation, and immersive technologies enriches the storytelling capabilities of newsrooms, offering audiences more engaging and appealing news stories. However, despite their integral role, the researcher observed that the members of the creative department typically do not identify themselves as journalists. Instead, they view their role through enhancing and translating journalistic content into visually compelling formats. This distinction in self-identification highlights the interdisciplinary nature of modern news production. While journalists bring expertise in gathering and verifying information, creative professionals bring specialized skills in visual storytelling and technology integration. Together, they collaborate to deliver comprehensive and impactful news coverage that meets the evolving expectations of digital audiences. However, regarding the third direction the production of traditional news is based on the journalist who writes the script, selects images and videos, conducts the required montage (editing), and adds his voice to the report. Hence, it is a process that depends on the journalists since they are assigned to produce a specific news story. However, if a story is produced using immersive technology, this requires coordination with the creative department. Therefore, this coordination process adds the time factor as a prominent challenge to producing the VR or AR story. The following extracts illustrate this direction:

> *IVW18: We in the creativity department are in constant communication with the editorial department. Sometimes, due to the time factor, we suggest alternatives in implementation. For example, we determine the appropriate technology for display, whether it is using augmented reality based on integrating virtual elements, or virtual reality based on integrating a complete virtual environment, or mixed reality based on combining these two technologies together. (Creative Manager, Group 2: Creative Desk, 2023)*

> *IVW12: The time factor emerges as a challenge because the production process is controlled by several elements: choosing the topic carefully, coordinating with the creative department, and agreeing on the presentation form. After completing these elements, we write the script so that it can be implemented in one of two forms. Either*

> *the broadcaster records the material in a green studio (Chroma), and then the creative department carries out the design process and installs the virtual material, or a virtual material is created in advance and the broadcaster presents the story live on-air. Both forms require time to implement. (Journalist, Group 1: News Desk, 2023)*

It is worth noting, according to what the participants indicated, that the time required to implement a particular news story varies from one story to another. There is a story that may require a few days, and there are other stories that must be implemented on the same day. Participants also agree that quality must trump quantity, and this requires giving sufficient time to produce a deep, attractive, and comprehensive journalistic story that enriches the news content, and not just to highlight visual dazzle. IVW17 mentions in the following extract how Al Jazeera channel excelled in this, due to its serious interest in the time element, even though she works for a competing news channel:

> *IVW17: Al-Jazeera has produced a number of wonderful stories. I am in contact with a journalist who works at Al-Jazeera. He only produces one story a month, but it looks amazing and impressive. Al-Jazeera`s production based on immersive technology is limited, but impressive. (Journalist, Group 1: News Desk, 2023)*

"Issues of "time and cost are, however, still a challenge in journalism as a whole and become more evident when adopting and experimenting with new media for news dissemination" (Vindenes and Gynnild, 2020, p. 34). As the time factor has been explained above, it is worth to shed light on costs as well. Regarding cost expenses, through VR applications, there is a useful and applicable presence of virtual production in the television studio. The Weather Channel has been one of the news organisations that has supplemented studios the most (Ikonen and Uskali, 2020, p. 151). Since the summer of 2018, AR has been included in weather predictions (ibid, 2020). They intended to use AR and VR in the production of 80 percent of its programmes by 2020 (ibid, 2020, p. 151). The virtual weather map is the most basic illustration of this. The weather forecaster is within a computer-generated virtual environment known as *Chroma-Keying*, which the audience sees while he points with his hands to the movement of wind or rain in various locations across the world and displays a map behind him that shows the sun and clouds (Sadeq, 2018). As a result, it is no longer necessary to construct certain decorations or set up a distinct studio for weather predictions, which lowers expenses. In other words, one of the objectives attained by the use of immersive technology is the decrease of newsroom expenditures(ibid 2018). Thanks to technology, a variety of locations

have been created that were not possible to create in a studio but could be recreated virtually on a screen and appear genuine via the use of Virtual Studio techniques by production professionals (ibid 2018). The term *Virtual Studio* according to Sadeq refers to:

"a number of technological tools that are used in simulating the environment of television stations, that it is equipped with its own artistic effects and is equipped with smart moving cameras that maintain dimensions and deal with great intelligence during its movement, where the virtual decorations and backgrounds interact with what is in the studio from anchors, guests and others" (ibid, 2018, p. 169). Participants refer to this discussion through the following extract:

> *IVW10: In the past, the studios in Sky News Arabia were limited, and this is normal because there is a main studio and there are other angles that can be exploited or used in specific news segments. But upon virtual reality technology, this contributed to the creation of an infinite number of virtual studios, which we dedicate to more than nine or ten different programmes at the lowest possible cost. (Group Editorial Director, Group 3, 2023)*

While producing a news story abroad involves additional expenses, such as sending a team of anchors, and cameramen and, in particular, renting the equipment and cameras required in that nation, there are other ways to cut costs in the newsroom production process. Journalistic content may now be produced in virtual channel studios at a lower cost using immersive technology. Both IVW5 and IVW3 refer to this according to the following extracts:

> *IVW5: We have benefited from this technology to save costs because it is available within the channel. But moving large crews to film one report in one day in one location will be costly to the station and its budget. (TV Presenter/ Journalist, Group 1: News Desk, 2023)*

> *IVW3: If we want to produce a news story on the economic dynamics in China, there is no need to go to China, and the accompanying travel costs and spending huge sums of money. We replace this by rebuilding places virtually at a lower cost. (TV Presenter/ Journalist, Group 1: News Desk, 2023)*

7.5.3 Impact on skillsets (Capital)

Participants discuss the kinds of skillsets that journalists need to develop as immersive technology becomes more prevalent in newsrooms. They emphasize the need for journalists to hone their "imagination narrative style" and "relying on visual aids to simplify news" abilities. These two types of skillsets are discussed thoroughly below:

7.5.3.1 Imagination narrative style

According to the study respondents, the writing style for VR news stories requires a unique journalistic narrative language that is far from the traditional news style. For instance, the Inverted Pyramid Model applied in traditional reporting follows the "decreasing importance" principle, starting with the most important and gradually moving towards the less important details, highlighting valuable and most important information. Hence, the Inverted Pyramid provides the audience with the most important competitiveness and newsworthy information, followed by less important details (Schade, 2018). In other words, Inverted Pyramid "is based on the idea that the elements of a story should be arranged in decreasing order of importance, with the most important ones appearing at the top, and the less important – for example, background information – following below" (Busà, 2014, p. 62).

On the other hand, according to the participants, VR news stories require an attractive style of storytelling where journalists are used to telling a story not obeying traditional news narration. Writing VR news stories requires a captivating and powerful narrative of events aimed at attracting a larger audience and making them feel interested in viewing the news story as the below extracts will explain. As a result, journalists confront a significant difficulty when producing news articles that use virtual reality technology. These videos demand a variety of creative writing talent. These extracts indicate the difference when writing VR news stories:

> *IVW4: I have a lot of imagination work involved when I write a VR or AR story. When a journalist prepares a typical report, they view the visual materials—such as images and videos—and then use that information to construct their report. In that case, we write for the footage that we already own. Conversely, when I write a VR story, I don't have visual material; instead, I imagine the visual content. Then, the creative department builds the virtual video. I see the scenario in my mind that goes with each phrase I write, and the creative department creates the image based on my vision. (Journalist, Group 1: News Desk, 2023)*

> *IVW17: The difference between writing a traditional news story and another one that uses virtual reality is imagination, keeping in mind that what I imagine can be applied. Sometimes there may be unworkable ideas, so I have to make sure that the transition between the scenes of the VR story is possible with ease and rationality. (Journalist, Group 1: News Desk, 2023)*

The visual material in VR stories is first reconstructed to support the news narrative. Therefore, the availability of an element of imagination for journalists who write VR stories is essential. However, imagination is not required for those journalists who write regular news reports based primarily on the original footage, which the news channels obtain from their subscriptions to news agencies such as Reuters, or through their correspondents in the field, or videos posted by citizens on social media sites. IVW5 provides an example of how to use imagination in writing a journalistic story based on dividing the VR story into scenes:

> *IVW5: We have resorted to using virtual reality technology to explain the circumstances of the assassination of the late former Prime Minister Rafik Hariri in Lebanon. We produced virtual scenes sequentially as if I were telling a story. I first went to the place where Rafik Hariri's car was bombed. After that, I went to the bus that was used in this bombing. Here I tracked how the bus moved until it reached the site of the bombing. Then I moved to another scene, where I stood in front of the famous statue of Rafik Hariri in Beirut and continued explaining what happened. I indicated the type of explosive materials used in this bombing and the number of civilian victims. Then I moved on to talk about those accused of committing this assassination. (TV Presenter/ Journalist, Group 1: News Desk, 2023)*

Moreover, regarding the aspect of “capital”, the study's participants concentrated on the significance of crafting a captivating and swiftly paced VR news story. They stressed that while language should be descriptive, it should also be information-rich. Here, both IVW8 and IVW4 provide an explanation in the following extract:

> *IVW8: Writing for VR news stories involves a fast-paced writing style that follows a series of related scenes as it's a short film scenario but using both VR and AR. We made an eight-minute VR news story about the earthquake in Turkey. But, neither the video's monotony nor the feeling that there is a second to spare will affect you. You will seek to watch the entire video. This tale was delivered by one of the presenters, who*

described the events leading up to, during, and following the earthquake. The production was written and executed in a really appealing manner. (Managing News Editor, Group 3, 2023)

IVW4: When I write a VR story, I need to write it in a way that brings reality closer to the audience. Since the story is relatively longer compared to traditional news, attention must be paid to writing in a way that does not make the audience feel bored. This requires the broadcaster's interaction in the method of presentation, and interaction with the virtual elements or the virtual environment that are integrated so that an unconventional, interesting, and deep journalistic story is produced. (Journalist, Group 1: News Desk, 2023)

A challenge facing news organizations lies in their ability to employ non-traditional journalists, who have writing skills that combine journalistic sense and narrative-writing talent. In other words, the challenge of integrating non-traditional journalists into news organizations involves navigating the intersection of journalistic sense and narrative-writing talent, which necessitates a deeper exploration through the lens of habitus and organizational change. Traditional journalism has historically emphasized skills such as objective reporting, fact-checking, and adherence to editorial guidelines. However, as news consumption habits shift towards digital platforms and multimedia storytelling, there is a growing demand for journalists who can blend these traditional skills with narrative flair and storytelling prowess. Pierre Bourdieu's concept of habitus is particularly relevant here, as it refers to the ingrained habits, skills, and dispositions that individuals acquire through socialization and experience within specific social contexts (Bourdieu, 2008)). In the context of journalism, habitus influences how journalists perceive their roles, conduct research, and frame stories. Non-traditional journalists, who may come from backgrounds in creative writing, literature, or digital media, bring unique habitus that diverge from traditional journalistic norms. Their narrative-writing talent allows them to craft compelling and immersive stories that resonate with audiences in new and impactful ways. Organizational change within newsrooms is crucial for effectively integrating these non-traditional journalists. It requires a revaluation of hiring practices, editorial guidelines, and newsroom culture to accommodate diverse skill sets and perspectives. This shift not only enhances the storytelling capabilities of news organizations but also broadens their ability to engage with audiences across different platforms. Moreover, embracing non-traditional journalists contributes to the evolution of journalistic practices, fostering innovation

and adaptation in response to changing media landscapes. Hence, it can be indicated that these VR stories apply “Narrative story-telling”. This method according to Busà is “favoured by broadcast media, which prefer the chronological narrative structure over the Inverted Pyramid, as it is more compatible with the oral presentation of events” (2014, p. 69). This style is used in an innovative way to grow the audience and make the content more enjoyable (ibid, 2014). According to the interviewees, they stated that journalists write as though they were segmenting a news narrative into scenes. Every scene addresses a distinct development. As a result, they are accustomed to providing narrative context for every development, which makes the journalistic material close to the audience and infuses it with vitality. In narrative storytelling, as opposed to the Inverted Pyramid, the material is not presented in descending order of importance or with a lead in the conventional sense (ibid). Typically, the opening establishes the scene, usually by describing the circumstances or location where the event took place (ibid). It does not offer comprehensive background information, such as an account of the events and their conclusions, but instead invites the audience to continue watching the story, which is told in chronological order (ibid).

7.5.3.2 Relying on visual aids to simplify news

According to this study participants, the second skill that comes under the aspect of "capital" is the capacity to employ immersive technology to simplify news. Since the development of contemporary technology, journalists no longer rely only on news sources and footage to use in their reporting. However, their intention when using visual aids is to utilise them to simplify news and make it simpler for the audience to comprehend. One of the journalists points out, “Your task as a journalist is to simplify information for people, not to exercise guardianship and narcissism over them, which has shaken the image of the intellectual in people’s minds and made him a complex person who philosophizes without any benefit” (Alzayed, 2019). Accordingly, delivering news to the public must be done according to a simple method that aims to present the information clearly, in order to tell the public what is happening, or answer the five questions related to the news story. In other words, journalists ought to write simply, so the public won't have to read their articles more than once to grasp what they're reading (“Journalistic Writing | UAGC Writing Center,” n.d.). To ensure that everyone understands, even the most difficult ideas will be broken down and expressed in their own terms. In the case of textual journalism, then films, graphics, and visual explanations are added aspects in the field of visual journalism. In terms of simplifying the news content, these

components undoubtedly relieve the journalist of a great deal of burden because the image clarifies the news rather than the written version's use of esoteric vocabulary. Several participants in this study reported that one of the main goals of using virtual reality and augmented reality technologies in journalistic work is to simplify and interpret news information for the public. These extracts are taken from interviews with participants who participated in the study and reflect the entry of immersive technology into television newsrooms:

> *IVW20: The important goal of using this technology is to simplify the news because sometimes the information is difficult. For example, we used this technology in covering the American elections. When you want to explain how American states are distributed, the voting mechanism of American voters, how a particular state is classified as Democratic or Republican, and elaborate on all of that geographically, VR or AR technologies contribute to explaining all of this to the Arab audience in a way that simplifies the news. This is also the case when you want to explain the process of distributing seats in Congress or the Senate and how the division, numbers, and important positions are made in the elections. (Producer, Group 1: News Desk, 2023)*

Some study participants indicated in their responses that there are news stories that require explanation and interpretation. Immersive technology such as virtual reality and augmented reality has made it easier for the public to understand, comprehend, and to simplify these kinds of news stories for them as well. Because of a number of variables, the most commonly created topics, which witnessed employing this technology were military related. The news was dominated by the Ukrainian-Russian war because of its effects on the Arab and Western publics at the same time, as well as its political and economic ramifications. The discussion about the weapons that the West is equipping Ukraine with and the kinds of weaponry that Kiev is receiving made it clear how crucial it is to tell the public about these weapons and allow them to be compared. Hence, immersion technology has become important in the process of explanation, interpretation, and simplification because there aren't many images of these contemporary weapons and there is a pressing need to convey news information about their characteristics and how they affect the nature of the battles between the Ukrainian and Russian armies. Immersive media can help audiences visualize and understand the complex nature of modern warfare, bridging the gap between abstract information and real-world impacts. By providing detailed, immersive depictions of weaponry and battlefield dynamics, these

technologies can enhance viewers' comprehension of the conflict's intensity and consequences. However, while these technologies can deepen emotional engagement and provide a more visceral understanding, they also risk influencing audience perceptions by presenting events in ways that may either sensationalize or oversimplify the situation. As researchers like (De Bruin et al., 2022) argue, immersive journalism can shape public opinion by evoking emotional responses, which may alter the audience's understanding of complex geopolitical conflicts. Thus, while immersive technologies offer valuable tools for explanation and interpretation, their impact on audience perception must be carefully managed to avoid potential bias or manipulation.

Al Arabiya channel has produced a special show concerned with military topics, or a show deals with political news from a military perspective, which is *Askaretaria*: An Arabic word derived from military. Accordingly, IVW2 points out how immersive technology has contributed to the news content of this show:

> *IVW2: There are many weapons for which there are no visible materials, but only designs and nothing more, such as sixth-generation aircraft. Until now, countries are still working on it, such as the United States, Britain, Italy, Japan, France, Germany, and China. There are, of course, no photos of this generation of aircraft, but rather just designs, not real pictures of these weapons, and therefore we have used augmented reality to elaborate on the specifications of these weapons and bring them closer to the public. (General Manager/ News Director, Group 3: Experts, 2023)*

This does not imply, however, that technology has not been applied to other topics; rather, as was covered in the preceding chapter, this technology has been employed in a variety of technological, sports, political, and economic contexts. One of the primary objectives of employing immersive technology has been to make news content easier to understand. The following extract demonstrates how VR has been included in health reports such as Corona.

> *IVW7: This contemporary technology has been employed in an effort to simplify the data, particularly in cases when the setting is purely imaginary. It is not possible to view video footage of the cells and how the coronavirus infects them. We described the virus's mode of operation, the part the bats played in this, and how the infection spread from a human to a human intermediate. Information is now easier to understand and*

more fun thanks to technology, which has also simultaneously integrated the elements of emancipation, enjoyment, and simplicity. (Journalist, Group 1: News Desk, 2023)

As for Al-Sharq Channel, it focused on presenting a rich material of economic topics concerned with the currency and metal exchanges, the energy market, the economic repercussions of political crises, and the intensifying competition between the Western Pole, represented by the United States, and the other Pole, represented by Russia and China. Since this type of journalistic story depends mainly on numbers and percentages, Al Sharq Channel has introduced immersive technology in the production of economic news, in order to simplify and explain it to the Arab audience. IVW3 sheds light on this according to the following extract:

IVW3: We focus on business and economic news eleven hours out of the twenty-four. Traditionally, graphs from satellite networks like Sky News Arabia, Al Arabiya, and Al Jazeera are shown on the Video Wall (A huge screen that the anchor stands in front of to discuss a news story's specifics). *This is how news networks on television have always presented their content. We made the decision at Al Sharq Channel to use augmented reality technology to show graphs, making them seem like three-dimensional components in the centre of the studio next to the presenter. In an attempt to make the distribution of material to the public easier and more visually striking, we invested in this technology. (TV Presenter/ Journalist, Group 1: News Desk, 2023)*

7.6 Conclusion

The integration of immersive technologies, such as virtual reality (VR), augmented reality (AR), and mixed reality (MR) into journalism represents both significant opportunities and notable challenges according to the respondents in this study. As highlighted by (Ross, 2022), the new generation of media practitioners is increasingly focused on leveraging the unique affordances that VR can bring to storytelling. These affordances include visual dazzle, compensating for the lack of footage, elaborating and simplifying complex stories, cutting costs, offering a new form of "eye witnessing," and enhancing competition within the media landscape. Each of these affordances showcases the potential for immersive technology to transform journalistic practices by providing new ways to engage and inform audiences. However, the justification for integrating immersive technologies into journalism often centres on the need to ensure that the additional spatialized audiovisual data enhances rather than detracts from the storytelling process. This concern underscores the challenges associated with

immersive technology, such as the necessity for journalists to develop different narrative styles, the considerable amount of time required to produce high-quality content, and the imperative to avoid compromising editorial integrity. These challenges necessitate a careful balancing act to ensure that the integration of technology serves to augment the core journalistic mission rather than create unnecessary distractions. In reflecting on the research findings from 20 interviews conducted in the study, it is clear that the potential benefits of immersive technologies must be weighed against the practical and ethical considerations they introduce. As the media landscape continues to evolve, it is crucial for journalists to navigate these affordances and challenges thoughtfully, ensuring that technological innovations are harnessed to enhance the delivery of credible and engaging news content. The continuous discussion within the journalism community regarding the optimal ways to integrate immersive technologies is crucial for the evolution of media storytelling. Participants in this study indicated that Arab newsrooms have not yet fully implemented immersive experiences. Instead, they have utilized immersive technologies to present news in modern, visually captivating ways that surpass traditional methods. However, offering a truly immersive experience necessitates specific supporting tools and devices. As stated by OnQ Blog (2022) fully immersing in a story requires a phone or head-worn device like glasses or a headset. Without these devices, maintaining an immersive viewing experience is not feasible.

Moreover, the integration of immersive technologies in Arab newsrooms has sparked significant discussion about its impact on news credibility. Immersive technologies, such as virtual reality (VR) and augmented reality (AR), can enhance storytelling by providing a more engaging and realistic experience for the audience. However, this technological shift also raises concerns about the authenticity and reliability of the news. Since these technologies involve digital reconstruction and simulation, audiences might question whether what they are seeing is a true representation of reality or an embellished version. The potential for manipulation and the blending of factual reporting with artificial elements can erode trust, making it imperative for news organizations to establish stringent ethical guidelines and transparency in how immersive content is created and presented. This balance between innovation and maintaining credibility is crucial for news outlets seeking to leverage new technologies without compromising their integrity.

Incorporating Bourdieu's field theory, particularly through the aspects of doxa, habitus, and capital, provides a nuanced perspective on the affordances and challenges associated with

integrating immersive technology into newsrooms. Immersive technologies offer specific affordances such as visual dazzle, which aligns with the field's doxa—the accepted norms and beliefs about what constitutes impactful news presentation. This visual dazzle not only enhances the aesthetic appeal of news content but also reinforces the perceived legitimacy and modernity of the news organization within the journalistic field. Furthermore, immersive technologies compensate for the lack of footage and enable the elaboration and simplification of complex narratives. These capabilities resonate with journalists' habitus—the ingrained dispositions and practices within the field that shape how narratives are constructed and communicated. By offering new ways of "eye witnessing" events, immersive technologies challenge traditional journalistic practices, potentially altering the habitus of news reporting by expanding the repertoire of storytelling techniques available. Moreover, the adoption of immersive technologies involves significant capital—both economic and cultural. Economically, newsrooms invest in the technology and expertise required to produce immersive content, cutting costs in other areas such as on-the-ground reporting. Culturally, immersive technologies enhance newsrooms' symbolic capital—the prestige and authority derived from innovative storytelling methods that attract and retain audiences in a competitive media landscape. However, integrating immersive technologies into newsrooms also presents challenges that reflect tensions within the field. Participants highlighted the need for a different narrative style, which can disrupt established journalistic practices and norms (doxa). This shift requires journalists to navigate new storytelling conventions that may not align with traditional journalistic principles. Additionally, the time-intensive nature of immersive content production challenges newsroom habitus, where efficiency and timeliness are paramount. Furthermore, concerns about compromising editorial content underscore the field's emphasis on credibility and objectivity—a central tenet of journalistic habitus. Journalists must navigate these challenges to maintain the integrity and trustworthiness of their reporting while harnessing the potential of immersive technologies to enhance storytelling and audience engagement. Bourdieu's field theory enriches our understanding of how immersive technologies shape and are shaped by journalistic practices, norms, and challenges. By examining the interplay of doxa, habitus, and capital within newsrooms adopting immersive technologies, we gain insights into both the transformative potential and the complexities inherent in integrating new technologies into journalistic fields.

Chapter 8: Discussion

8.1 Introduction

Based on the explored themes and sub-themes from both videos and interviews analysis, immersive technology offers opportunities and affordances that significantly enhance journalistic practices. It plays a crucial role by making content more visually appealing and engaging, particularly in capturing the attention of modern audiences accustomed to multimedia experiences (Pavlik, 2013). This technology also facilitates an immersive eyewitness role, particularly in situations where accessing physical locations or navigating challenging conditions such as conflict zones or natural disasters is difficult or dangerous (Kalyanaraman, 2002). Additionally, immersive technology addresses practical challenges faced by journalists, such as compensating for the lack of available footage or overcoming limitations related to studio space and equipment size. Virtual and augmented reality, for instance, enables the creation of virtual environments that can depict scenarios and events, enhancing the depth of storytelling. However, integrating immersive technology into journalistic practices raises ethical considerations that warrant scrutiny. "Immersive Journalism brings new ethical challenges because some practices and procedures go against conventional journalistic standards" (Pérez-Seijo and López-García, 2019, p. 954). These technologies have the potential to blur the line between reality and simulation, prompting questions about accuracy, transparency, and the manipulation of visual narratives. Journalists utilizing immersive technologies must navigate these ethical challenges to maintain credibility and trust with audiences, ensuring that virtual representations accurately reflect the realities of the events being reported (ibid, 2019).

8.2 Ethical Considerations

According to the analysis, there is a need to shed light on these ethical considerations as follows:

8.2.1 Immersive technology as an infotainment tool

The way that news information is produced has changed significantly over the last several decades due to changes in the media environment (Patterson, 2000). Immersive technology has been integrated into news practice taking advantage of its technological affordances (Ross, 2022). Strong financial incentives to make a profit and the commercialization of news are seen

to be the main forces driving television news broadcasters to adopt news infotainment formats (ibid, 2000). “Several authors have defined infotainment formats as audiovisual techniques and production styles that emphasize dramatic structures, personalization, and human-interest approaches in television news stories” (Alencar and Kruikemeier, 2018, p. 1535). Below are some questions that Graber asked in their research entitled “The Infotainment Quotient in Routine Television News: A Director's Perspective”:

> *“To what extent does routine television news supply citizens with essential political information? To what extent are routine stories sensationalized so that their informational content is diluted or obscured? How do television news directors frame routine news stories and rationalize the mix of factual reporting and dramatization that they present?” (Graber, 1994).*

They were referring to the term “infotainment”, which aims to blend entertaining with informative content. In September 1980, during the Joint Conference of ASLIB, the Institute of Information Scientists, and the Library Association in Sheffield, UK, the terms "infotainment" and "infotainer" were first used (Kwanya et al., 2015). Infotainment is “a type of media that tries to combine educational or useful information and entertaining content. Infotainment is designed to help promote the acquisition of specific information, skills, or trades in a format that appeals to users”(Rouse, 2016). Moreover, infotainment “usually refers to televised news content” (ibid, 2016)**.** This approach is utilised instead of traditional narrating. This term is not new, but as technology is getting much more innovative, it affected the way both information and entertainment are combined within news stories. VR technology made storytelling more entertaining. According to (Matthews, 2024):

> *“Infotainment, is television programming that presents information (as news) in a manner intended to be entertaining. Infotainment came about through the blurring of the line between information and entertainment in news and current affairs programming, whether in the selection of news stories (e.g., more emphasis on celebrity gossip, crime stories, and human-interest pieces) or in their presentation (stylistically, through flashy graphics, fast-paced editing, music, and sound effects, as well as in terms of tone and approach, through the use sensationalism or satire)”.*

News organizations used to distinguish between the so-called soft news or entertaining news, and hard news (Matthews, 2024). Soft news started to be referred to as infotainment by

communications theorists in the 1980s (ibid, 2024). However, infotainment is often confused with soft news, although its hybrid approach allows it to cover a wide range of topics (Alencar and Kruikemeier, 2018). Several academics have stressed that what constitutes infotainment depends in large part on how the news is presented (Graber, 1994). Immersive technology can be employed to provide infotainment for the narrative. However, the concept of infotainment, which blends information with entertainment value, has garnered criticism for its potential negative effects on public knowledge and the integrity of news reporting. Research into the impact of infotainment often highlights several key concerns, underscoring its influence on the public's understanding of important issues and the overall quality of journalism. In both the public and academic domains, infotainment has caused some to question the quality of news media (Baum, 2003). They claim that infotainment trivializes news and current events, which has major ramifications for accurate political knowledge and opinion formation (ibid, 2003). “Infotainment has often been connected to pejorative terms, such as tabloidization and sensationalism… contributing to a decrease in political knowledge conveyed by the media” (Alencar and Kruikemeier, 2018, p. 1536). The apparent issue is that by encouraging thrilling televisual spectacles and compelling plots, infotainment in television news conforms to narratives that trivialize even the most important matters (Graber, 1994). “From this viewpoint, infotainment news has negative effects on how viewers process the news” (Alencar and Kruikemeier, 2018, p. 1536). Infotainment can lead to a deficit in knowledge and understanding among the public for several reasons (Kinneer, 2009). Firstly, the prioritization of sensationalism and entertainment over depth in reporting can result in a superficial treatment of complex topics. Infotainment tends to prioritize popular or trending topics rather than substantive news that may be less captivating but more relevant to societal issues or policy discussions (Bennett and Segerberg, 2012). This selective reporting can contribute to a shallower understanding of global events and diminish the public's ability to critically engage with complex issues. Furthermore, infotainment often trivializes news by framing serious issues in a light-hearted or entertaining manner. This can include using sensationalized language, focusing on celebrity gossip, or presenting news stories as forms of entertainment rather than as serious matters with significant societal implications (McNair, 2018). Arab journalists use infotainment. They applied modern visual technologies in their journalistic reporting. Virtual reality (VR) has the potential to be seen as infotainment if it prioritizes entertainment value over the accuracy and depth of the information presented. While VR can offer immersive experiences that make stories more engaging, there is a risk that it could be used to sensationalize or oversimplify complex issues, turning news into a form of spectacle

rather than providing thoughtful analysis. This challenge is not unique to VR; other forms of journalism, such as clickbait headlines or exaggerated imagery in traditional media, can also misrepresent events by distorting facts to capture attention. When journalistic content focuses more on attracting views than on delivering truthful, balanced reporting, it undermines the credibility of the news and risks misleading the audience. Therefore, it is essential that journalists use immersive technologies like VR responsibly, ensuring that the focus remains on providing a well-rounded, accurate portrayal of events without sacrificing journalistic integrity for entertainment value.

Research has shown that when news is presented in an entertaining format, viewers may remember the entertainment aspects more vividly than the factual content, leading to potential misinformation or misinterpretation of important events (Pegoraro, 2015). This phenomenon can contribute to a public perception that news is primarily for entertainment purposes rather than for informing citizens about critical issues affecting their lives. Hence, while infotainment can attract wider audiences and increase viewer engagement, it comes with significant drawbacks. These include a potential deficit in public knowledge and understanding, as well as the trivialization of important news stories. Media scholars and practitioners continue to debate how best to balance the need for engaging storytelling with the responsibility to provide accurate, in-depth information that fosters informed public discourse. Nonetheless, it is not difficult to predict that the phenomenon's implications for audience processing of public information and democratic discourses will be shaped by the growing insertion of technological infotainment elements into news narratives (Alencar and Kruikemeier, 2018). More attention has recently been paid by academics to empirical examination of the formal aspects of television news, with the argument that focusing on subjects or events is inadequate to evaluate narrative patterns that impact how infotainment is really presented in the news (Machill et al., 2007). However, the infotainment function is highly regarded and raises some issues for the practice of journalism (Wu, 2022).

8.2.2 Credibility in Immersive Technology

The internet presented new obstacles for journalism, and as digital and technological advancements continue, the media must reevaluate and modify long-standing norms and guidelines in order to address novel narrative formats and cutting-edge narrative technologies (Pérez-Seijo and López-García, 2019). For instance, VR technology can create a sense of presence, bringing viewers closer to the covered news (Sundar et al., 2017) and enhancing its

truthfulness (Nielsen and Sheets, 2021). This tactic involves focusing on the concept of "place" and proximity (Usher, 2019). The goal is to engage viewers by creating a sense of closeness between them and the place covered in the news. This connection can be established through emotional attachment or a feeling of proximity to the location (Kukkakorpi and Pantti, 2021). However, these technological affordances should not impact both integrity and credibility negatively. Researchers have raised the question “How can journalism codes of ethics help shape the new platforms, and shape a future in which journalism continues to play an important role in society?” (Gynnild et al., 2020, p. 1). Probably the most notable among them is the dedication to ethical codes and standard guidelines. However, this cannot be maintained without considering the ethical issues that govern journalistic practice. Stated differently, Uskali and Ikonen (2020) suggested that further in-depth research is required to comprehend how to apply immersive journalism while adhering to journalistic norms. According to their discussion, “journalism ethical standards offer a valuable basis for immersive journalism practices, but... there is indeed a need for some updates and fine-tuning”(ibid, p. 54). These claims, taken as a whole, show an ethical commitment to news values such as credibility and transparency.

One of the primary ethical concerns surrounding visual journalism is image manipulation, a problem that arises when media outlets employ pictures, images appear first, followed by videos (Pérez-Seijo and López-García, 2019). The visual boom of the twenty-first century was accompanied by increased risks associated with digital manipulation due to new technology advancements (ibid, 2019). Journalists may add or delete aspects from a rebuilt virtual setting by using immersive technology. Such acts imply that the reality as it was recorded changes, which is contrary to the fundamental principles of journalism ethics and honesty (ibid, 2019). The problem is that one of the risks raised in the discussion of immersive journalism is that this new medium for reporting might be seen as a tool for audience manipulation, which would go against the credibility standards of journalism (Johnson, 2020). When creating recreations for Immersive Journalism, there are two primary forms available (Pérez-Seijo and López-García, 2019). On one side, some video methods are used to film simulations of actual occurrences, while conversely, experiences are created with computer visuals that are also grounded in reality (ibid, 2019). Media should be aware that the tale is based on real events and that the information is a reconstruction, regardless of the format. Hence, a clear indication should be there when news outlets intend to reconstruct virtual scenes aiming at maintaining credibility. These scenes “should normally be based on a substantial and verifiable body of evidence. They

should also be identifiable as reconstructions, for example by using verbal or visual labelling or visual or audio cues, such as slow motion or grading" (Kent, 2016). Immersive technologies can blur the line between reality and simulation, causing audiences to question the authenticity of the news content. VR and AR are reconstructions rather than direct representations, which can lead to scepticism about the accuracy of the information presented (Pavlik, 2019). This scepticism arises because these immersive experiences can blend real events with artificial elements, making it harder for viewers to distinguish between factual reporting and simulated content. It is important to think about how this technological integration affects the news principles. Immersion technology may have a detrimental influence on journalism practice and news credibility. Journalistic activities are governed by ethical concerns. According to Uskali and Ikonen, "journalism ethical standards offer a valuable basis for immersive journalism practices, but...there is indeed a need for some updates and fine-tuning." (2020, p. 54). They addressed the numerous requests for additional regulations to ethically recognize the use of immersive journalism (ibid, 2020, p. 54). These assertions, taken as a whole, show an ethical commitment to journalism ideals like openness, trustworthiness, and accountability (ibid, 2020).

Researchers want to look at two aspects of the ethics rules for immersive journalism: "existing ethical contexts," as they may be understood via the analysis of press ethics body decisions and codes of ethics, and "journalists' own ethical concerns" while undertaking immersive journalism (Sánchez Laws and Utne, 2019). After examining these viewpoints, they want to put forward a few essential components that may assist in reshaping ethical standards to more effectively tackle the problems brought up by immersive journalism (ibid, 2019). Regarding the main role of journalists, "the central purpose of journalism is to provide citizens with accurate and reliable information they need to function in a free society" (Steel, 2009, p. 3). This is not an argument against the use of technology or contemporary visual aids in journalism; rather, it is about maintaining the norms, principles, and values of journalism, including trustworthiness and credibility. In other words, Immersive technology, while offering innovative ways to engage audiences, should be used in journalism with careful consideration to avoid manipulating or compromising the credibility of the news. The primary goal of journalism is to inform and educate, and immersive techniques should enhance this mission rather than distract or sensationalize. While immersive formats like VR and 360-degree videos can create powerful emotional connections and foster empathy, it is crucial that they do not distort the facts or exaggerate the severity of events to attract attention. Journalists must ensure

that the use of such technology remains aligned with ethical standards, prioritizing accurate representation and unbiased reporting. If immersive technology is used responsibly, it can deepen the audience's understanding and connection to a story without sacrificing journalistic integrity.

8.2.3 Arab newsrooms do not offer an immersive experience

It is indicated that the use of immersive technology in newsrooms accomplished a number of objectives, some of which were related to the news organisations in order to achieve competitiveness, some of which were reflected in the way news content was presented, some of which attempted to alter the conventional method of presentation directed towards the public. Thus, this provides a glimpse into the current state of immersive technology utilisation. Based on their responses, participants in this research indicated that the audience was not provided with an immersive experience via virtual reality, augmented reality, or mixed reality technologies. Put another way, the intention of incorporating this technology into journalism was not to create an immersive experience. According to what the participants explain, technology has undoubtedly helped offer journalistic information in a new way that goes beyond the conventional manner of presentation.

The notion of visual dazzle in modern media, particularly with immersive technology, closely parallels trends observed during the first Gulf War in the 1990s. For instance, technologies like smart bombs and onboard cameras transformed the war into a spectacle, making it resemble a video game and creating an "eyewitness" experience for viewers (Thussu and Freedman, 2003). This transformation turned the serious conflict into a form of entertainment, a trend echoed in today's use of immersive media technologies. Thussu and other scholars noted that Gulf War coverage utilized these visual technologies to create narratives that were both informative and visually captivating. The use of real-time footage from smart bombs allowed viewers to witness military operations with unprecedented detail and immediacy, blurring the lines between news and entertainment (Kellner, 2019). This spectacle-driven approach captivated audiences but also raised concerns about desensitization and oversimplification of complex geopolitical events. Similarly, the contemporary use of VR, AR, and other advanced visual aids in journalism aims to engage audiences by providing immersive experiences. However, this would risk prioritizing visual impact over nuanced reporting, potentially overshadowing critical analysis and context. The spectacle of visual dazzle in both eras underscores the enduring challenge for journalists to balance engaging

storytelling with rigorous, unbiased reporting. Reflecting on the Gulf War's media coverage helps us understand the implications of current technological advancements in news media, emphasizing the need for ethical considerations and maintaining editorial integrity (Baudrillard, 1995). The journalistic tale now incorporates visual dazzle aspects to draw in the audience. Furthermore, in a new crystallisation of the notion of “eye witnessing”, this technology has helped face some obstacles, including the expense of constructing new studios and the cost of sending journalists to cover a specific event. In order to provide the news to viewers in a seamless, insightful, and creative manner, it also helped simplify the material and explain it. But what about the primary objective of this technology, which is to provide the audience with an immersive experience so they may experience the events as if they were firsthand witnesses? Nevertheless, this immersion is neither maintained nor deployed in the selected newsrooms. In other words, no immersive experience can be achieved without the aid of instruments such as VR glasses. According to the participants` responses, none of the auxiliary equipment needed to achieve an immersive experience was taken into account by the news channels that were selected. Hence, if so, why did news outlets integrate immersive technology like VR, MR, and XR into their journalistic practice without fulfilling its primary function of offering an immersive visual experience? This inquiry is significant because, despite adopting these technologies, many newsrooms have not provided the necessary equipment, such as VR glasses, which are essential for delivering a truly immersive experience.

The viewer's consuming behaviour has changed with the tremendous development in technology and the world of television. One of the reasons is due to the ease with which anyone can obtain technology. Through online programmes and applications, content creation has become available to everyone. It is smart for news organizations to respond to this change that has occurred in viewer consumption behaviour, keeping pace with the technology evolution. Accordingly, the following question can be asked:

What is driving these cutting-edge apps that help audiences consume content: a "technological motive" that relies on the idea that technology is evolving as the media is catching up with it, or an "editorial motive" that starts with the content first and tries to use technology to improve audience consumption? The driving forces behind the adoption of technological advancements in media consumption are multifaceted, encompassing both "technological motives" and "editorial motives". These concepts are often discussed in the context of media and technology studies.

The rapid development of technologies such as artificial intelligence (AI), virtual reality (VR), augmented reality (AR), and 5G networks creates new opportunities for media innovation (Owen et al., 2015). These technologies enable new forms of content creation and distribution, transforming traditional media landscapes (ibid, 2015). For instance, VR technology has been employed to create immersive storytelling experiences, providing audiences with a deeper engagement with news stories (ibid, 2015). The "technological motive" is driven by the rapid evolution of technology itself, which often sets the pace for media innovations. The technological motive focuses on the influence of technology on the production, distribution, and consumption of media content. It involves considerations such as the development of new platforms, tools, and distribution channels. Scholars like McLuhan (2001) and Manovich (2002) have also agreed on how technological advancements shape media practices and experiences. Technological advancements such as faster internet speeds, more powerful processors, and sophisticated software capabilities are continuously pushing the boundaries of what is possible in media production and consumption. This motive is rooted in the idea that as technology progresses, media organizations must adapt and integrate these advancements to stay relevant and competitive. For example, the advent of 5G technology is enabling smoother and more immersive streaming experiences, facilitating the rise of augmented reality (AR) and virtual reality (VR) in news and entertainment. Similarly, advancements in artificial intelligence (AI) and machine learning are being used to automate and enhance content creation and distribution processes, making media more personalized and accessible. On the other hand, the "editorial motive" starts with the content and seeks to use technology to improve how audiences consume and engage with it. This motive is driven by the need to enhance storytelling, provide deeper insights, and make content more interactive and engaging. The editorial motive encompasses the intentions and goals behind the creation and dissemination of media content (Carey and Adam, 2009). It includes objectives such as informing, entertaining, educating, or advocating for certain viewpoints. Journalists and content creators are increasingly leveraging new technologies to enrich their narratives and provide more context (ibid, 2009). For instance, interactive infographics, data visualizations, and AR elements are being used to present complex information in more understandable and engaging ways (Pavlik, 2019). The editorial motive emphasizes the importance of content quality and integrity, aiming to use technology to support and enhance the storytelling process rather than overshadow it. This approach ensures that the technological tools are used to complement the editorial goals, providing audiences with a richer, more engaging experience without compromising the accuracy and depth of the information presented.

INW3 indicated that the "editorial motive" requires searching for ways to reach a wider segment of the public and harnessing this technology to benefit the public in consuming content. However, it seems that the prevailing motive is the "technological motive" based on using the available technology, not considering the public's needs. However, as the participants of this study explained immersive technology has significantly contributed to presenting journalistic information in novel ways that transcend traditional formats, not creating an immersive experience, are Arab newsrooms looking to produce immersive content so that the audience can watch it using VR glasses or other supportive devices? IVW3 points out:

> *"The use of VR glasses and tools that support immersive experiences will not be widely used in the world and will not reach news organizations before achieving some additional shifts in technology related to the bandwidth, meaning reaching the sixth generation, which is many times faster than 3G and 4G. Then, an infrastructure will be available that allows the flow of visual, audio, and written content, and audience demand will begin according to their needs. I believe this will not happen until 10 years from now". (TV Presenter/ Journalist, Group 1: News Desk, 2023)*

This quote makes it abundantly evident that significant technological infrastructure development is required before news organisations can create and disseminate material to a large audience—rather than simply a select few hundred VR glasses enthusiasts. There is a very small number of immersive news stories that make immersive experiences accessible to the audience in comparison to the vast quantity of content that news outlets produce. Overall, "the volume of AR productions has remained low, and smaller or medium-sized newsrooms have mostly stayed out of the whole business" (Ikonen and Uskali, 2020, p. 153). *Syria Project* is an example of an immersive news story that was produced by de la Peña, the pioneer of immersive journalism. However, will news organisations adopt this kind of immersive reporting as standard practice? IVW10 responded to this question as well:

> *"News channels seek to reach the largest possible segment of the audience. If the audience requires this immersive experience using virtual glasses or other aids, we can take this step, but since this has not happened yet in TV newsrooms, why do we go for it? I doubt that this will happen because it is very difficult for VR glasses to become the audience's choice whenever they want to watch the news". (Group Editorial Director, Group 3, 2023)*

As a result, news organisations become aware of new technology that is available, buy it, and try to incorporate it into their reporting. However, these large channels found that they could not offer an immersive experience for the audience when attempting to include immersive technology in their journalism. This further supports the notion that the link between technology and content is driven by the "technological motive" rather than the "editorial motive." Seemingly, IVW8 contributed to this discussion, providing a similar point of view to the previous ones saying:

> *"There is no comprehensive vision in the region of how to adapt to these changes, but Al-Arabiya channel is very interested in the latest technological developments and is using them before other media institutions. With any technological development, Al-Arabiya will be the first to adopt it. But at the current level, there is a trend in the future to integrate artificial intelligence into news work, and this is what I can tell you now and nothing more". (Managing News Editor, Group 3, 2023)*

There is currently a dearth of study on the technology's user experiences in storytelling, even though it offers numerous untapped possibilities for usage in journalism (Ikonen and Uskali, 2020, p. 152). However, from what is stated by the directors of the three channels included in this study, and based on the findings, these channels used immersive technology, without providing an immersive experience for their audiences.

In practice, the most effective media strategies often balance both technological and editorial motives. Media organizations that successfully integrate cutting-edge technology with high-quality content creation are better positioned to attract and retain audiences. For example, *The New York Times* has utilized VR to provide immersive reports from conflict zones, enhancing the storytelling while leveraging the latest technological advancements (Owen et al., 2015). This balanced approach not only captivates audiences with innovative experiences but also maintains the journalistic standards necessary for credible and reliable reporting. Editorial integrity ensures that media content remains accurate, fair, and independent of undue influence. It involves upholding journalistic ethics and standards to deliver trustworthy information to the audience (Kovach and Rosenstiel, 2014). Both technological and editorial motives play crucial roles in driving the adoption of new technologies in the media industry. While technological advancements provide new opportunities for innovation, the editorial motive ensures that these technologies are used to enhance the quality and engagement of the content. By understanding

and balancing these motives, media organizations can effectively leverage technology to improve audience consumption and stay competitive in the rapidly evolving media landscape.

8.3 Bourdieu's field theory and ANT within the study

This study employs a dual theoretical framework that combines Pierre Bourdieu's sociological concepts with Actor-Network Theory (ANT). This approach enhances our understanding of how immersive technologies are transforming journalistic practices in Arab media. Bourdieu's field theory helps us grasp the social dynamics and power structures that shape journalists' interactions with new technologies, emphasizing the influence of capital, habitus, and doxa on their behaviors and perspectives (Bourdieu, 1984). In contrast, ANT focuses on the relationships among various actors—both human and non-human—highlighting how they collaboratively create meaning within journalism (Crawford, 2020). This combined framework facilitates a thorough examination of the intricate relationship between technology and journalistic practice, revealing how immersive technologies not only alter the news production process but also challenge conventional ideas of journalism. The insights derived from this theoretical synthesis provide a solid basis for interpreting findings from qualitative content analyses of selected videos and interviews with industry professionals. By investigating the application of immersive technology in Arab newsrooms, the research uncovers important implications for the future of journalism and media consumption. As the media landscape continues to change, understanding these dynamics will be crucial for both practitioners and researchers. This work sheds light on the interplay between technology and journalism, offering insights that can guide industry practices and inform future studies. Overall, this theoretical framework deepens our comprehension of immersive journalism in the Arab context and sets the stage for further exploration of the broader effects of technological advancements in global media.

Chapter 9: Conclusion

9.1 Introduction

This final chapter aims to summarize the main findings and recommendations derived from the research titled "An Examination of the Use of Immersive Technology in Pan-Arab Newsrooms" and to highlight its key contributions to the field. This research delves into a nascent area of news production that has arisen by integrating immersive technology in journalism, exploring its impact on journalistic practice. The primary motivation of this study is to comprehend the increasing utilization of immersive technology within news media organizations, particularly in the context of Arab broadcasting news. The investigation adopts a qualitative approach, utilizing content analysis of selected videos and conducting in-depth interviews with professionals and experts in the field. Throughout this research, significant insights have emerged regarding the adoption, challenges, and potential benefits of integrating immersive technology in newsrooms. These insights provide valuable implications for both theory and practice within journalism, highlighting opportunities for innovation and enhancement in storytelling. Moreover, this study offers several recommendations aimed at guiding news organizations, educators, and industry professionals in effectively integrating immersive technologies into their workflows. These recommendations underscore the importance of training, collaboration across disciplines, and the need for ethical considerations when implementing immersive technologies in journalistic practices. This research contributes to advancing understanding in the evolving landscape of journalism by shedding light on the transformative potential of immersive technology. It underscores the importance of adapting to technological advancements while maintaining journalistic integrity and audience trust in an increasingly digital and immersive media environment. This synthesis of findings and recommendations serves as a valuable guide for both practitioners and researchers interested in the future of journalism in the context of emerging technologies.

This thesis is structured into eight chapters: the introduction; a literature review, which includes two chapters focusing on the Arab media landscape and immersive journalism, discussing the associated opportunities, challenges, and ethical considerations in both the Western and Arab contexts. The subsequent chapters cover the theoretical framework and research methodology, followed by two separate chapters presenting the results of the content analysis for both videos and in-depth interviews. The final chapter serves as the conclusion. It begins by revisiting the study's objectives and summarizing the key findings. It then explores

the significance and contributions of this research. The next section offers practical recommendations, and the chapter addresses the study's limitations and suggests directions for future research.

9.2 Discussion

First of all, it is worth reflecting on the way this research reflected on the research questions. In response to research questions RQ1 and RQ3 together regarding thematic patterns applied via immersive technologies in Pan-Arab newsrooms' reporting and how these technologies are integrated, the analysis of 18 sampled videos from Al-Arabiya, Sky News Arabia, and Al-Sharq reveals three distinct patterns: augmented reality (AR), virtual reality (VR), and mixed reality (MR). Augmented reality is prominently utilized across these newsrooms to overlay digital information onto real-world settings, enhancing storytelling with interactive elements such as maps, data visualizations, and simulations. This technology enriches the audience's understanding of complex topics by providing contextual information in a visually engaging manner. Virtual reality, observed in several instances, is resorted to recreate virtual environments, allowing presenters to experience events as they report from the field. This approach enhances a deeper connection with the reported events. Mixed reality integrates elements of both AR and VR to blend virtual objects seamlessly into the physical world, offering innovative ways to present news stories that bridge the gap between digital content and real-world reporting contexts. These thematic patterns underscore the Pan-Arab newsrooms' commitment to leveraging immersive technologies to enhance the depth, immediacy, and interactivity of their journalistic narratives.

Research questions RQ2 and RQ4 together investigate the motivations behind the integration of immersive technologies in reporting among Pan-Arab newsrooms, based on the analysis of 18 videos (6 from each channel: Al-Arabiya, Sky News Arabia, and Al-Sharq) and interviews with 20 industry professionals. The findings indicate a multifaceted rationale for adopting these technologies. Firstly, virtual studios are utilized to enhance the visual dazzle of news presentations, making stories more captivating and engaging for audiences. This approach not only attracts viewer attention but also sets a higher standard in visual storytelling, thereby enhancing the competitive edge of newsrooms striving to distinguish themselves in a crowded media landscape. Secondly, these technologies simplify the presentation of complex news topics by using interactive elements and visual aids that clarify information and improve viewer comprehension. Thirdly, immersive technologies compensate for the lack of traditional

footage in inaccessible or hazardous locations, enabling journalists to report on events remotely and safely. Moreover, integrating immersive technologies like virtual studios and virtual eye witnessing helps newsrooms cut costs associated with traditional reporting methods, such as travel expenses and equipment or logistic issues like getting official approvals. By leveraging these technologies, Pan-Arab newsrooms can streamline operations while maintaining high production values and expanding their reporting capabilities. Overall, the integration of immersive technologies serves a strategic purpose in enhancing news presentation, improving accessibility to information, and optimizing resource management within Pan-Arab newsrooms.

Research question RQ5 delves into the limitations faced by Pan-Arab newsrooms when incorporating immersive technologies into their reporting practices. Through an examination of 18 videos (6 from each channel: Al-Arabiya, Sky News Arabia, and Al-Sharq) and insights gathered from interviews with 20 industry professionals, several significant challenges emerged. Firstly, the adoption of immersive technologies necessitates a substantial investment of time. Newsrooms face significant challenges in allocating time and effort to research, develop, and implement these technologies, all while ensuring alignment with editorial standards and objectives. This process often demands iterative testing and refinement to achieve seamless integration without compromising the quality or accuracy of journalistic content. Secondly, maintaining editorial integrity poses a critical challenge. As newsrooms explore immersive storytelling techniques such as augmented reality (AR) and virtual reality (VR), they must navigate the balance between innovation and maintaining the ethical principles of journalism. Issues related to narrative coherence and the preservation of factual accuracy require careful consideration to avoid sensationalism or distortion of news events. Lastly, the transition to immersive reporting necessitates a shift towards a distinct narrative style that effectively harnesses the capabilities of these technologies. This dictates that journalists adapt unique storytelling methods to suit interactive formats, ensuring that content remains compelling and informative. These challenges underscore the complexity inherent in integrating immersive technologies into Pan-Arab newsrooms' workflows, highlighting the need for strategic planning, technical proficiency, and editorial sensitivity to overcome obstacles and maximize the potential of immersive storytelling in journalism.

The integration of modern visual technologies such as Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR) into news reporting has enhanced the journalistic

practice. However, amidst the excitement of these technological advancements, it is crucial to consider how their use should not compromise the credibility and fundamental values of journalism. Firstly, maintaining credibility in journalism is paramount regardless of the medium or technology used. As noted by Eric Newton (2018), senior adviser to the president at the John S. and James L. Knight Foundation, "The rules of journalism, the things that make it ethical, the things that make it fair, the things that make it accurate, are unchanged by the technology." This underscores the importance of adhering to ethical standards and rigorous fact-checking processes, regardless of whether the news is presented through traditional methods or cutting-edge technologies like VR and AR. Secondly, transparency becomes even more critical when employing immersive technologies in news production. Audiences must be informed when virtual elements are used to depict scenes or events. This transparency helps maintain trust and ensures that viewers understand the distinction between factual reporting and enhanced visualizations. As highlighted by the Poynter Institute, a nonprofit journalism organization, transparency is essential in fostering credibility: "When the technology used to tell a story is as important as the story itself, the same ethical and journalistic standards apply (Nover, 2017). Disclosure, context, and transparency are key" (ibid, 2017). Moreover, the values of accuracy and fairness must be upheld rigorously when using VR, AR, or MR in news. While these technologies offer compelling ways to engage audiences and provide immersive experiences (such as some immersive stories produced by de la Peña (de la Peña et al., 2010), they should not be employed in a manner that distorts facts or misleads viewers. Journalists must ensure that the virtual or augmented elements align with the factual reality of the story being reported. As outlined by the Society of Professional Journalists (SPJ), "ethical journalism should be accurate and fair. Journalists should be honest and courageous in gathering, reporting, and interpreting information" (SPJ Code of Ethics, 2014). Furthermore, the potential for sensationalism or manipulation exists with the use of immersive technologies. Careful consideration must be given to how these technologies are utilized to avoid sensationalizing or exaggerating news events for the sake of visual impact. While the adoption of VR, AR, and MR in news represents an exciting frontier for journalism, it is imperative that these technologies are used responsibly to uphold the core values of accuracy, fairness, transparency, and credibility. By maintaining ethical standards and ensuring that technological enhancements serve to enhance rather than undermine journalistic integrity, news organizations can harness the full potential of modern visual technologies while preserving trust and credibility with their audiences.

Based on this study's findings, the integration of immersive technologies into news production has undeniably transformed how stories are told. These technologies can potentially captivate and maintain a more engaging viewing according to the interviewees` responses in ways that traditional media cannot, making news more compelling. The interviewees referred to it as “visual dazzle”. While enhancing audience attention is a significant benefit, it is crucial that the use of immersive technology in news goes beyond mere spectacle and adds substantial value to the reporting. One of the primary advantages of using immersive technology in news is its ability to enhance understanding. VR, for instance, allows viewers to experience the surroundings and emotions of how news stories are being told. By providing a more visceral understanding of complex issues, immersive technologies can enrich the audience's comprehension and engagement with the news. However, it is essential to note that the effectiveness of immersive technology in news hinges on how responsibly it is utilized. Simply incorporating VR or AR for novelty or visual impact without enhancing the substance or accuracy of the news can undermine its value. As highlighted, the effectiveness of immersive journalism in educating and informing hinges significantly on its capacity to adhere to ethical and editorial norms. Consequently, news outlets must guarantee that immersive technologies are used to enhance news content, foster deeper comprehension, and preserve the integrity of journalistic practices. In conclusion, while the adoption of immersive technology in news holds promise for enhancing audience engagement and understanding, its true value lies in how effectively it enriches storytelling and adds depth to news coverage. By leveraging these technologies responsibly to provide meaningful insights and empower audiences with interactive experiences, news organizations can harness the full potential of immersive storytelling to advance journalistic excellence in the digital era.

9.3 Main findings

The researcher in this section begins by indicating the main findings of the study as follows:

9.3.1 Affordances, challenges, and ethical considerations of the integration of immersive technology in journalism

The analysis of both videos and interviews revealed a range of specific affordances linked to the application of immersive technology in journalism. This technology facilitates the delivery of dynamic information, transcending traditional static data presentation. By doing so,

it fosters a more interactive and engaging narrative experience, capturing the audience's attention. The “visual dazzle” offered by immersive technologies plays a crucial role in captivating viewers. The immersive visuals not only enhance aesthetic appeal but also stimulate audiences into the story and encourage them to explore complex topics in a more compelling way (Gynnild et al., 2020). These technologies serve as valuable tools for compensating for a lack of actual footage. In situations where events are difficult to capture—due to geographical, political, or safety constraints—immersive technology allows news organizations to create vivid visual representations, thereby maintaining storytelling integrity and viewer engagement. Immersive technology aids in the elaboration and simplification of complex narratives, making intricate subjects more digestible for a wider audience. By breaking down complex information into visual formats, these technologies help audiences understand significant issues that might otherwise seem overwhelming or inaccessible. Furthermore, this kind of production can help cut costs by reducing the need for extensive on-location reporting or establishing additional studios, replacing them with virtual ones. Additionally, immersive technology introduces a novel mode of "eyewitnessing," where TV presenters can anchor news as though they were physically present (Zelizer, 2007). Adopting immersive technology provides a competitive edge for news outlets in an increasingly crowded media landscape. By leveraging these innovative storytelling methods, organizations can distinguish themselves from competitors and try to attract more audiences.

However, the study highlighted several significant challenges that come with integrating immersive technologies into newsrooms. One primary concern is the necessity for a different narrative style tailored to the news format. This adaptation may require journalists to shift from conventional storytelling techniques, emphasizing a more interactive and participatory approach that can significantly diverge from traditional practices. This transition can be particularly challenging for seasoned journalists accustomed to linear narratives, as they must rethink how they engage audiences and convey complex stories effectively. Additionally, utilising immersive technology demands a substantial investment of time (Vindenes and Gynnild, 2020). One significant challenge of integrating immersive technology into journalism is the considerable time commitment it demands. This process involves several intricate steps, including extracting the core story, crafting a compelling narrative, and coordinating closely with the creative desk to ensure that the visual elements or environments align effectively with the overall reporting. Each of these tasks requires careful attention and collaboration, which can strain resources and extend production timelines, potentially complicating the fast-paced

nature of news reporting. Maintaining the integrity of editorial content is another critical challenge. There is a genuine risk that the captivating nature of immersive technology might overshadow the core facts of the news story. Journalists must ensure that the focus remains on accurate reporting, rather than being overly influenced by the technological bells and whistles. Balancing innovation with journalistic ethics becomes vital, as compromising factual accuracy for the sake of an engaging presentation can lead to diminished credibility and trust among audiences (Uskali and Ikonen, 2020)time. Importantly, while immersive technologies present exciting opportunities for storytelling, they must be employed judiciously to preserve the credibility of the news. While technology continues to evolve, finding the right balance between innovation and integrity will be essential for successfully integrating immersive technologies in journalism.

9.3.2 Implementation of three immersive technology patterns without delivering an immersive audience experience

The study's findings reveal that the integration of immersive technology within the selected Arab newsrooms—specifically Al-Arabiya, Sky News Arabia, and Al-Sharq—demonstrates the adoption of several popular technological patterns, notably Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR). These technologies are utilized to enhance storytelling, offering innovative ways to present news content that captures the viewer's attention. All three news networks (Al-Arabiya, Sky News Arabia, and Al-Sharq) mostly used three forms of technology during the creation of their news broadcasts. AR is “the technology that overlays digital content on top of the real world” (OnQ Blog, 2022). The second technology is VR which provides a virtual environment to enhance immersion whether “in a real-life situation or a creative imaginary experience” (ibid, 2022). The last one is MR which “brings the best of both AR and VR together by capturing the real world through a series of cameras and sensors – then projecting it on a display before your eyes” (ibid, 2022). It is worth mentioning that XR “refers to all the above” (ibid, 2022) . XR is a general term that is used for any technology that modifies reality by incorporating digital components into the physical world in any way.

Despite the use of modern visual technologies aimed at providing an immersive experience, the intended level of immersion was not achieved. The immersive technologies employed by the selected news channels—Al-Arabiya, Sky News Arabia, and Al-Sharq—failed to deliver a truly immersive experience because they did not incorporate necessary supporting devices,

such as VR glasses, head-mounted displays (HMDs), or cardboard viewers. While these channels utilized immersive technologies, they did not produce immersive videos that could completely immerse viewers or engage them fully.

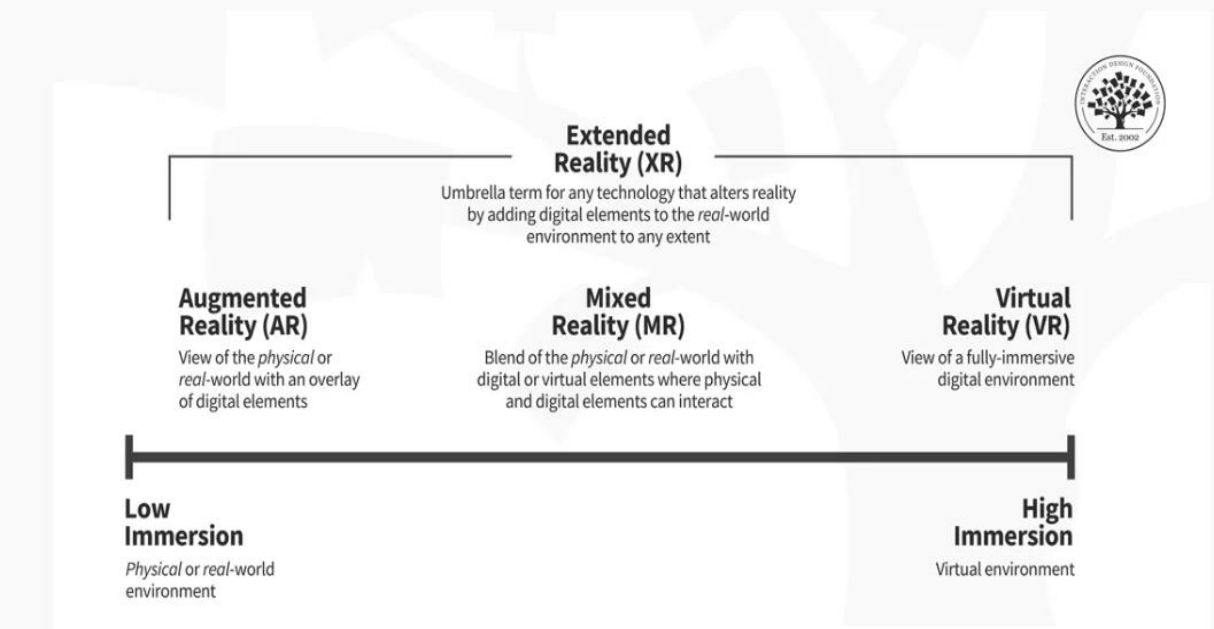


Figure 9.1: Representation of XR technologies according to the spectrum of immersion (Tremosa, 2023).

According to Figure 9.1 offered by Tremosa (2023), immersive technologies give audiences or users varying levels of immersion experience. The supportive tools mentioned are essential for achieving any level of immersion depicted in Figure 8.1. The researcher investigated whether the selected news stories necessitate the use of additional devices for optimal presentation, such as smartphones, virtual reality glasses, headphones, head-mounted displays (HMDs), or cardboards. The conclusion drawn was that the videos from the chosen channels—Al-Arabiya, Sky News Arabia, and Al-Sharq—do not require these devices, indicating that the stories can be effectively viewed without them. As previously highlighted in Chapter 3, certain Western games and immersive news stories have successfully allowed audiences to engage with content using VR glasses. Notably, the pioneering work of Nonny de la Peña brought significant attention to immersive journalism before it gained traction in major news outlets. Her project, "Gone Gitmo," created a virtual environment simulating the Guantanamo Bay detention centre, enriched with documentary recordings that enabled users to experience a level of immersion akin to that of the detainees s (de la Peña et al., 2010). Users engaged actively, being represented by an avatar that was "hooded, shackled," and transported via a C-17 cargo jet to Camp X-Ray, dramatically shifting their interaction from passive observation to active participation (ibid, 2010, p. 293). Moreover, one notable initiative in the

realm of immersive journalism is Project Syria, created also by Nonny de la Peña and her team. This project utilized computer-generated imagery (CGI), a technology commonly used in video game and news game design, to craft a compelling virtual reality (VR) news story (Flatlandsmo and Gynnild, 2020). The primary objective of Project Syria was to immerse viewers in two significant scenes from the ongoing conflict in Syria. According to Flatlandsmo and Gynnild, one scene powerfully depicted a massive explosion, capturing the chaos and intensity of the war, while the second scene focused on the plight of refugees who fled to Jordan and settled in the Zaatari refugee camp. This innovative approach not only aimed to inform audiences about the realities of the Syrian conflict but also sought to evoke empathy by allowing them to virtually experience these pivotal moments. Such projects underscore the potential of immersive technologies to transform news storytelling by providing audiences with a more engaging and impactful understanding of global events. The use of virtual reality devices, such as Oculus, as mentioned in Chapter 3, offers audiences a deeper immersive experience. Importantly, the lack of necessity for supportive devices in the videos also benefits viewers by eliminating additional costs; they can conveniently watch the news on their home televisions or through the channels' social media platforms using their smartphones. However, this accessibility will enhance audience engagement and immersion while reducing barriers to entry.

9.4 Contributions of the study

The exploration of immersive technology within the Arab media landscape is notably limited, making this study particularly unique and significant. While immersive journalism has gained traction in various global contexts, research specifically addressing its application in Arab broadcasting is scarce. This gap in the literature highlights the need for comprehensive analysis, especially given the region's dynamic socio-political environment and its growing digital media landscape. By focusing on how immersive technologies are utilized in Arab newsrooms, this study not only fills an important void but also provides valuable insights that can inform both regional and international discussions on media innovation. This unique perspective enhances the overall contribution of the research, positioning it as a critical reference point for scholars and practitioners interested in the intersection of technology and journalism in underrepresented contexts.

My research underscores the critical importance of upholding credibility and integrity in journalism, particularly in the face of advancing technologies and modern visual aids. While

technologies like augmented reality and virtual reality offer powerful tools for storytelling, it is imperative that journalists maintain rigorous adherence to ethical standards and principles. These technologies should enhance, not compromise, the accuracy and truthfulness of reporting. By prioritizing journalistic ethics over technological allure, journalists can ensure that their work continues to serve the public interest with transparency and trustworthiness, thereby safeguarding the integrity of the profession in an increasingly digital age.

This research also aims to contribute to the expanding body of knowledge surrounding immersive technology by thoroughly exploring its value and potential opportunities within the realm of journalism. By addressing this emerging element, the current study enhances our understanding of how immersive technologies can transform broadcasting newsrooms, particularly in the context of immersive journalism. The findings are crucial for comprehending the evolving landscape of journalism as it adapts to technological advancements. However, a key contribution of this study is its exploration of ethical considerations related to immersive technology.

9.5 Limitations of the study

A key limitation of this study is its scope, which did not extend to engaging with audiences regarding their experiences with immersive technologies such as VR, AR, and MR. The research focused primarily on professionals in the newsroom (journalists, producers, editors, TV directors, etc.), as well as experts and managers. However, the exclusion of audience perspectives and user experience of these technologies represents a significant gap in understanding how immersive technologies are received and experienced by viewers. This omission could be considered a limitation, as it restricts the depth of insights into the full impact of these technologies in news reporting.

Further, the study did not explore VR news from the perspective of user experience, which is another area that could have provided valuable insights into how immersive technologies affect audience engagement and perceptions. These areas represent gaps in the field, but were not addressed due to the constraints faced during the research.

The research was also limited by access-related challenges. Gaining permission to access studios and production units proved difficult, particularly with one news organization. While access was eventually granted to most selected newsrooms, the process highlighted the cautious approach media organizations take regarding external scrutiny, which can limit

opportunities for in-depth fieldwork. Moreover, concerns regarding my position as an employee of a competing news outlet made it challenging to assure participants that the research was purely academic, rather than for professional gain. This issue became particularly relevant within the competitive Arab media landscape.

Additionally, time constraints played a significant role in limiting the breadth of the study. Obtaining necessary permissions and convincing news channels to participate took considerable time, which reduced the number of interviews that could be conducted. Furthermore, one major news outlet in the Arab region declined to participate, leading to the exclusion of valuable perspectives and narrowing the research focus to only three channels: Al-Arabiya, Sky News Arabia, and Al-Sharq. These time and access challenges ultimately limited the diversity of perspectives and the overall scope of the research. These limitations underscore the complexities involved in conducting research within the media sector, particularly when exploring innovative technologies. Despite these challenges, the insights gained from the accessible newsrooms and participants still contribute valuable knowledge to the field of immersive journalism in the Arab context.

9.6 Direction of future research

This research paves the way for future scholars to further explore the role of immersive technology in the Arab region, encouraging a deeper examination of its applications, challenges, and ethical considerations within the local media landscape (Arab region). By highlighting the unique context of Arab broadcasting, subsequent studies can investigate how immersive technologies are being utilized and adapted in response to regional socio-political dynamics. Moreover, comparative research could be particularly fruitful, as it allows scholars to assess the differences and similarities in the use of immersive technology between Arab and Western contexts. Such comparisons could provide valuable insights into the cultural, economic, and technological factors that influence the adoption of immersive journalism. This ongoing dialogue will enrich the academic discourse and contribute to a more nuanced understanding of how immersive technologies can shape the future of journalism globally.

Future research should investigate why Arab newsrooms have not yet fully embraced immersive journalism, particularly in terms of delivering genuine immersive experiences to their audiences. This inquiry could explore several factors, including technological infrastructure, editorial practices, and audience receptivity to immersive content. Additionally,

it would be beneficial to assess whether Arab newsrooms possess the capacity and willingness to adopt immersive technologies, as well as the potential barriers they face in doing so. Understanding these dynamics could provide critical insights into the feasibility of implementing immersive journalism in the region and inform strategies for enhancing audience engagement through innovative storytelling. By addressing these questions, future studies can contribute to a more comprehensive understanding of the state of immersive journalism in the Arab world and its potential trajectory.

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APPENDIX

Consent Form

This consent is related to a study about the use of immersive technologies in Pan-Arab Newsrooms. This research will contribute to the emerging field of immersive journalism examining the reasons behind the use of immersive technologies in Arab newsrooms. It will also shed light on specific immersive patterns of journalistic practice that have been integrated into reporting. Moreover, the Research will enable an understanding of the obstacles that journalists Work within and the limitations the immersive industry faces through the production process. The study explores new horizons and stands on the unique exposure that immersive technology offers in the field of news storytelling as well. This study Will also examine the market viability and appeal of immersive technologies in journalism.

Title of the project: An Examination of the Use of Immersive Technologies in Pan-Arab Newsrooms"

Name of PhD student: Ahmad Assad Faris Thahir
Email: A.Thahir1@unimail.derby.ac.uk

Name of Supervisor: Prof. John Steel
Email: J.Steel@derby.ac.uk

		Please tick box
1.	I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.	☐
2.	I understand that my participation is voluntary and that I am free to withdraw within one month of the interview without giving a reason.	☐
3.	I agree to take part in the above study.	☐

		Please tick box	
		Yes	**No**
4.	I agree to the interview being audio recorded	☐	☐

5. I agree to be quoted in publications with my position, title and name identified ☐ ☐

If you don't agree with 5, please answer 6.

6. I agree to the use of anonymised quotes in publications ☐ ☐

Name of Participant	Date	Signature
Ahmad Assad Faris Thahir		
Name of Researcher	Date	Signature

Participant Information Sheet

A. About this project

Title of Project: **An Examination of the Use of Immersive Technologies in Pan-Arab Newsrooms.**

This study titled aims to explore how immersive technologies which include (VR, AR, 360-degree- video, and XR) are used in pan- Arab newsrooms, as the researcher chooses the most important channels in the Arab region which are Al-Arabiya, Sky News Arabia, and Al-Sharq that have also applied immersive content in their reporting. This research will contribute to the emerging field of immersive journalism examining the reasons behind the use of immersive technologies in pan-Arab newsrooms. It will also shed light on specific immersive patterns of journalistic practice that have been integrated into reporting. Moreover, the Research will enable an understanding the obstacles that journalists Working within and limitations the immersive industry face through the production process. The study explores new horizons and stand on the unique exposure that immersive technology offers in the field of news storytelling as well. This study Will also examine the market viability and appeal of immersive technologies in journalism.

This research will contribute to the recent academic debate on the impact of journalism technology on the journalistic practice in the Pan-Arab newsrooms. The findings of this study will not only contribute to the literature on Arab digital journalism, but it may also inform the Arab journalists' community as well as news agencies. The study will also benefit the Arab audience as it will contribute to the public debate about the way news is used to influence, if not manipulate, the public opinion across the region.

B. Your Participation in the Research Project

Why you have been asked?

The project is based on the following data sources:

1. Interviews
2. Content Analysis.

You have been asked as a journalist or technician:

What happens if you want to change your mind?

If you decide to join the study, you can change your mind and withdraw within one month of participation. I will completely respect your decision. There are absolutely no penalties for stopping.

What would happen if you joined the study?

If you agree to join the study, you will be interviewed for 30- minutes to 1 hour where you will be asked specific questions about your views.

Are there any risks?
I do not think there are any significant risks due to the study. If you did feel that there was any stress involved, you can stop at any time.

What happens to the interview results?
I will collect the data interviews to use as a basis for my analysis. I intend to use quotes from the interviews after translating them into English. If you prefer not to be identified in the research, you will be anonymised to protect your identity.

Are there any benefits from taking part?
There are no direct benefits to you for taking part. However, I hope that my research will be of interest to academic researchers, media institutions, and media students in the UK and Middle East.

How I protect your privacy
All the information I get from you is strictly confidential. I will not use any identifiers and will keep your identity anonymous if this is your preference.

YOU WILL BE GIVEN A COPY OF THIS SHEET TO KEEP, TOGETHER WITH A COPY OF YOUR CONSENT FORM

Name: Ahmad Thahir
Email: a.thahir1@unimail.derby.ac.uk

Supervisor Name: Prof. John Steel
(j.steel@derby.ac.uk).

Ethical Approval

Ethics ETH2223-0199: Ahmad Thahir

Date Created	11 Sep 2022
Date Submitted	26 Sep 2022
Date forwarded to committee	29 Sep 2022
Researcher	Ahmad Thahir
Student ID	[redacted]
Category	Postgraduate research student
Supervisor	John Steel
Project	An examination of the use of immersive technologies in Pan-Arab Newsrooms
College	College of Arts, Humanities and Education
Current status	Approved

Debriefing Statement

Thank you for your participation in this research titled “An Examination of the Use of Immersive Technology in Pan-Arab Newsrooms. This letter is to remind you as a participant in the study titled that you can change your mind and withdraw within one month of participation. The researcher will completely respect your decision. There are absolutely no penalties for stopping. Also, if you did feel that there is a reason to withdraw, you do not have to justify that. On the other hand, your participation was important as this research will contribute to the emerging field of immersive journalism examining the reasons behind the use of immersive technologies in Arab news TVs. It will also shed light on specific immersive patterns of journalistic practice that have been integrated into reporting. Moreover, the Research will enable an understanding of the obstacles that journalists Work within and the limitations the immersive industry faces through the production process. The study explores new horizons and stands on the unique exposure that immersive technology offers in the field of news storytelling as well. This study Will also indicate the market viability and appeal of immersive technologies in journalism. The findings of this study will not only contribute to the literature on Arab digital journalism, but it may also inform the Arab journalists’ community as well as news agencies. The study will also benefit the Arab audience as it will contribute to the public debate about the way news is used to influence public opinion across the region. The final results of the research will be published as a PhD thesis for the University of Derby. All results are grouped together; therefore, individual results are not available. Your participation will remain confidential. If you have any additional questions regarding this research, please contact Ahmad Thahir (a.thahir1@unimail.derby.ac.uk) or Prof. John Steel the supervisor of this study (j.steel@derby.ac.uk).

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* Dates will be included later

Cover Letter to Participants

Dear research participants,

This project`s title is "An Examination of the Use of immersive technologies in Pan-Arab Newsrooms". This research will contribute to the emerging field of immersive journalism examining the reasons behind the use of immersive technologies in pan-Arab newsrooms. It will also shed light on specific immersive patterns of journalistic practice that have been integrated into reporting. Moreover, the Research will enable an understanding of the obstacles that journalists Work within and the limitations the immersive industry faces through the production process. The study explores new horizons and stands on the unique exposure that immersive technology offers in the field of news storytelling as well. This study Will also indicate the market viability and appeal of immersive technologies in journalism.

Your participation is highly appreciated as your experience in the field of journalism, and your views as a journalist or technician working in pan-Arab newsrooms will enhance the results of this study.

If you agree in principle to take part in this study a participant information sheet and consent form will be provided, providing further details and a signature of your consent. you can change your mind and withdraw. If you agree to participate in the study, you will be interviewed for 45- minutes to 1 hour where you will be asked specific questions Relating to the topic of digital tools. As a researcher of this study, I will collect the data from interviews to use as a basis for my analysis. Also, all the information I get from the participants is strictly confidential. The researcher will not use any identifiers and will keep all identities anonymous if this is the participant`s preference.

Interviews` Questions	
Area of Questions	**Questions**
1- Introductory Questions	1. What is your job title? 2. What are your responsibilities within your job role? 3. How many years of experience do you have with the organization you currently work for? 4. Have you previously participated in an academic study on immersive journalism?
2- Immersive Technologies	5. What types or forms of technology do you use in your organization? 6. What are the limitations of using Virtual Reality (VR) technology? 7. What are the limitations of using Augmented Reality (AR) technology? 8. What are the limitations of using Mixed Reality (MR) technology? 9. How do these types differ from 360-degree technology? 10. Is there a need to view news stories you produce through supportive means like VR glasses or others? 11. How do these technologies provide an immersive experience without supportive tools? 12. What criteria do you use to decide which type of technology to use? 13. Do you use these technologies with all types of news content? 14. Do you find that certain types of news content dominate the use of these technologies? 15. Are we talking about new developments in the use of these technologies beyond the use of chroma?
3- News Content	16. Do you use these technologies with all types of news content? Why or why not? 17. Have you found that these technologies are suitable for specific types of news? Why? 18. Why do we find that the use of these technologies has spread with military-themed news? 19. How has this technology affected editorial processes? 20. How has this technology affected journalistic writing style? 21. How is news material written based on the use of this technology? 22. What are the basics of writing in the context of immersive technology? 23. To what extent has the use of this technology affected content?
4- Opportunities	24. How has immersive technology served the news content industry? 25. How has it served news presentation? 26. Has the use of this technology achieved the visual appeal element? How?

	27. How has this technology contributed to competing with other news channels? 28. Is there a relationship between the use of this technology and the availability of visual materials like images and videos? Explain further. 29. Can we say that the use of this technology has spread among news channels? How do you justify your answer? 30. What opportunities has this technology provided for Arab viewers? 31. Have you found that the use of this technology has increased viewer interest and viewership? How? 32. Is there an opportunity to apply a fully immersive experience for Arab viewers through your channel?
5- Challenges	33. What are the main challenges you face in integrating immersive technology into journalistic work? 34. Tell me more about time-related challenges. 35. Tell me more about cost-related challenges. 36. Are there challenges related to space availability, studios? 37. Are there challenges associated with the availability of technical teams or creative department employees? 38. Are there challenges associated with having journalists capable of writing immersive content? 39. Are there challenges related to equipment, human resources availability? 40. Is there any challenge regarding continuing using this untraditional way of news presentation.

Videos Transcripts

A3 / Al-Arabiya

The story of Western weapons that failed in Ukraine facing the Russian attacks

If Western support for Ukraine has helped and helps it resist Russian attacks, it is a way to test Western weapons on the battlefield. There are stars that have shone and others that have escaped. For example, Howitzers, large and heavy, operate among other artillery equipment in a group called the battery. The artillery must fire and drive quickly by attaching it to the tow cart, moving to a new location to avoid enemy response to the fire. A U.S. defense commander confirmed to CNN that Howitzer is a thing of the past. Another weapon, effective Close Air Support Aircraft, is characterized by its slowness and the ability to fly at low altitudes. The Ukraine war proved that Close Air Support Aircraft are losers if they are used on the front line against an enemy that has modern air defenses. On the Russian side we will start from success, the Lancet-3 suicide drones provide Moscow with an important advantage, which is the ability to find and hit moving targets such as the HIMARS missiles from a long range. Unlike a conventional or guided missile, Lancet-3 can fly randomly in search of targets without pre-locating them.

B4 / Sky News Arabia

Facts of the Beirut Port Explosion in Virtual Reality

Breaking news from Beirut. A year ago, at this moment, at 6:08 PM a small fire turned into the most powerful of non-nuclear explosions in minutes. An explosion that is equivalent to a three-magnitude earthquake on the Richter scale. Beirut was shaken and nothing was the same. Civil Defense bride Sahar Fares was with her fiancé preparing for their wedding, but the newlyweds' dream was buried with Sahar. The songs, the Zaffah that she was supposed to bring Sahar to her groom, brought her to her final resting place. In the blink of an eye, Beirut turned into a disaster-stricken city, with losses estimated at between six and eight billion dollars. More than eighty-five thousand housing units within twenty kilometers of the port were completely or partially damaged. 4 Hospitals of them were severely damaged and out of service. Emergency rooms, pharmacies, and health. The flying glass turned the city into a distorted mosaic that was once beautiful, as did the buildings, and so did the faces and bodies of the thousand wounded people who were taken to hospitals. Facilities of various sizes and roles were full, and blood donation centres as well, here every drop that may save a brother, mother or husband. We return to the port, specifically to the wheat silos, the power of life, from which the Lebanese have lost more than half of their strategic stockpiles. In these silos, at least about five hundred thousand tons are stored. The explosion came to eliminate most of them. An explosion coincided with one of the wheat ships unloading its cargo. The story of the death that hid in hangar 12, two thousand seven hundred and fifty tons of ammonium nitrate had been stored here for six years. This danger is in an unguarded ward, with a hole in a wall, with a broken door. On that day, the port authorities decided to maintain the hangar, but without any oversight or indication of its content. They said, the sparks of the welding flew away, and the fire started. It was the authority’s story, keeping on repeating it, with the hope that they could mitigate the impact of the result. The Lebanese authorities promised to reveal the truth about the Beirut port explosion within five days, and the authorities did not say half of the meaningful information, nor part of the merits of the investigation. But wheat sprouted among the rubble of silos at Beirut's port.

A6 / Al-Arabiya

The first moments of a devastating earthquake

As the heavy hours elapse, what comes after them becomes heavier, and this scene becomes a dream and a past in a dream and conscience of those who lived through the defining minute or shorter. This is how the city was before the disaster. The next moment is rarely documented by camera lens. The first moment when the epicentre of an earthquake arises under this earth. It is not the one I stand on, but in the center, tens of kilometers away, 300 kilometers deep and more. Here to the degree of earthquake, is the biggest role. This is a 6-magnitude first tremor or a 5-magnitude aftershock that follows an earthquake that is at least a magnitude larger. Scientifically, the tremor is less severe, but this house did not fall, but collapsed due to its age or poor construction standards. A catastrophe that may befall dozens of residents and perhaps some passers-by, not numbers but lives that were safe before nature surprised them. But in the face of a bigger catastrophe by standards and obstacles, the destruction of one or two houses is seen as minimal damage. What is now about to be emulated is a catastrophe experienced before in Haiti in 2010, in California in the year eighty-nine, in Chile in 1960 and 2010, and elsewhere, where its fortunate inhabitants faced devastation, leaving thousands of victims under the rubble. This is what happened to southern Turkey and northern Syria after this moment. Every minute counts, and every second counts. Here was a bedroom, here was a living room, a kitchen, or a door. Everything that was once rubble, time racing to lift it with death, life, rescue, rubble, hope, and pain.

C3 / Al-Sharq

Sudan... The humanitarian situation in danger of bullets

After continuous fighting on various fronts in Sudan, all eyes have remained on Khartoum, where the risks to civilian lives are increasing, while the war between the official armed forces and the Rapid Support Forces (RSF) is turning into a street war or guerrilla war. Before talking about the dangers of this type of war, this is a quick review of its first start at the at the beginning of the nineteenth century when it was known as small wars, when Spanish armed groups launched attacks against the armies of Napoleon that occupied and exhausted Spain. That is why this war is often fought between a weak party and a stronger one. This kind of war turns into one of the qualitative specializations in modern military science, which official regular armies train in the event of a confrontation with gangs or armed groups inside cities. This is a result of the challenge these groups represent despite the military superiority of the official forces. Thus, in guerrilla wars, the military leaders often resort to a set of effective defensive measures, dividing their forces into groups equipped with light, medium and heavy weapons such as tanks. The street war is not absent from plans to secure supply routes, with the closure of military areas with earth mounds, especially around defensive buildings, with the possibility of digging corridors, trenches and tunnels between buildings, in light of the armed groups' reliance on the surprise factor and the attrition of the enemy. In guerrilla war, combat groups need to be trained to set up ambushes, with full knowledge of the details of the areas in which they are fighting. The military command usually divides the groups into three, taking over the tasks of support, securing and then attacking, in case it wants to close on the opponent's position. All these details therefore impose complications on the battle scene, which makes it difficult for any side to advance at the expense of the other. Therefore, regular armies often resort to intensive bombardment of targeted cities to destroy them completely or partially before allowing troops to enter. But this scenario is still not viable in Sudan. Street war for regular armies is a nightmare that must be avoided, especially since the human cost to civilians will be high if regular forces want to storm populated areas where armed groups are present.

C6 / Al-Sharq

How is the UN's response to the earthquake in Syria?

Earthquakes threaten civilian lives, especially if they are severe, but aftershocks can sometimes be just as serious. Before going deep to discuss its danger, it is necessary to understand the nature of its formation, as aftershocks occur after an earthquake, therefore, rocks continue to break free from their position in the ground along the fault line or near the epicentre. Their seriousness is related to their continuity, so aftershocks usually continue after an earthquake and may be over days, weeks, or sometimes even years, in the movement of destructive earthquakes that occur in the near-surface crust of the Earth. Therefore, aftershocks accompany shallow earthquakes more than deep earthquakes, i.e., those with a depth of more than sixty kilometers. But over time, aftershocks wane and decrease in strength. This does not mean that preventive measures should not be taken if they occur, as tremors are able to complete what the earthquake began by toppling cracked buildings and destroying infrastructure, which poses a threat to the lives of residents and workers in the field of rescue operations after the earthquake. Predicting an earthquake or aftershock can be difficult. However modern science is trying to employ artificial intelligence that is capable of analyzing large amounts of data captured from earthquake sensors around the world.