

EDITOR: ESENNUR SİRER

WAYS OF SEEING THROUGH THROUGH SCREEN PRACTICES

PALET YAYINLARI

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YAYINLARI

For Hürdal…

PREFACE

In his essay inspired by Walter Benjamin's "The Work of Art in the Age of Mechanical Reproduction," John Berger argues that, technically speaking, everything changed with the camera and that the idea of the image being bound to time disappeared. The camera eliminated the uniqueness of the painting. Thus, the meaning of the painting multiplied and expanded. The image, which first entered cinemas through films and later the viewer's home through television, became a subject of family conversations and joined its own meaning with theirs. In this way, the image entered millions of homes and multiplied its meaning by being seen in a different context in each one (Berger, 2013, pp. 18–20).

A century after its first technical emergence, television, as an extension of the eye, has merged with the mobile phone as an extension of the hand, the chip as an extension of the brain, and cloud systems as an extension of memory, becoming viewable across all screens. In a structure in which we have become integrated with screens, human beings, moving back and forth between the real and the virtual world, have reached the point of deciding where they wish to remain longer.

When artificial intelligence, which has brought a new momentum to the screen in the field of content production in recent years, is asked about the number of screens worldwide, it estimates that there are between 22 and 30 billion active screen devices. A compilation from statistical websites indicates that there are approximately 7.6 billion smartphones, more than 2 billion tablets and computers, and around 17.4 billion smart televisions and other smart screens. When game consoles, car screens, digital billboards, and all kinds of informational signage within cities are added to this number, the total increases considerably. Especially with the rise of devices that communicate with one another through IoT (the Internet of Things), the number of screens in the world is expected to far exceed the human population in the coming years (AI, Number of Screens in the World, 26.05.2026).

In addition to hardware, the amount of time spent in front of screens is also rapidly increasing. According to the screen time statistics published by Demandsage on March 9, 2026, a person worldwide spends an average of 6 hours and 54 minutes per day in front of a screen. This figure was measured as 9 hours for Generation Z, 6 hours and 42 minutes for Generation Y/Millennials, 4 hours and 10 minutes for Generation X, and 3 hours and 31

minutes for Baby Boomers. The time people around the world spend online is 6 hours and 40 minutes, of which 4 hours and 37 minutes is spent using mobile screens. The time spent on social media platforms was found to be 2 hours and 31 minutes (Kumar, 2026). This data may be evaluated in different ways, but the most important point shown by the statistics is that individuals spend a considerable amount of time with screens and that this duration has increased significantly over the years. Drawing on these data, the authors of this book have combined their reflections on individuals' screen-use practices with their own fields of study and addressed the subject under different headings. I thank each of them individually.

At this point, preparing a book on the transformation of the screen was highly valuable for me as an academic who worked in television broadcasting for nearly thirty years and who still teaches courses on television. In an era in which information is scattered recklessly, we set out to write this book, *Ways of Seeing Through Changing Screen Practices*, together with my academic colleagues who continue to produce knowledge with determination and plant hope for the future. Our aim was to draw attention to the relationship between the transformation of the screen and our own existence. In this context, we sought to question our transformation alongside the screen from historical, technological, sociological, and philosophical perspectives.

In the first chapter, Prof. Nursel Bolat examines the historical journey of the screen through the transition from photography, cinema, and television to the multi-screen ecosystem. Emphasizing that the screen has ceased to be merely a technological display device and has become one of the fundamental cultural interfaces of contemporary society, Professor Bolat also discusses the social effects of screen culture in her chapter. In her study, Bolat highlights the declining importance of physical presence and space in digitalized society and offers observations on digital identities, online interactions, and disembodiment.

Assoc. Prof. Esennur Sirer argues that the new screen ecology, shaped by interactive and viewer-centered approaches, has created intertwined yet distinct television worlds and economically different business models. At this point, Sirer explains that television has not "died"; on the contrary, it has undergone a profound evolution. Stating that technology-mediated broadcasting has taken shape as IPTV, OTT, and Social TV broadcasting, Assoc. Prof. Sirer also underlines that change cannot be considered independently

of content. She emphasizes that YouTube, with its structure prioritizing individual content production in a period when action itself becomes the aim, stands out as a field of praxis.

In her study, Damla Saylan evaluates the interactive structure that digital broadcasting platforms establish with viewers. She examines what kind of role interactive productions on digital platforms offer to the viewer and how this new narrative form transforms the viewer. In addition, Damla presents her views on what awaits the viewer in the near future and questions the freedom of the viewer who transforms from a passive consumer into an active narrator.

Assoc. Prof. Can Diker states that the screen has now become a field of probability in which visuality is continuously derived and recalculated, rather than a window or a surface of simulation. He explains how artificial intelligence, which optimizes measurable outputs rather than producing meaning in film production processes, organizes the screen. In his study, Assoc. Prof. Diker questions the form of creativity involved in audiovisual production generated through artificial intelligence and opens the subject to discussion through authorship, spectatorship, and collective memory.

Assoc. Prof. Ümmühan Molo and Dr. Deniz Reka Göksu state that cinema, which deeply feels the effects of digitalization due to its technically dependent nature, is also shaped in a relationship compatible with technology. They argue that when technology is considered not as an element of crisis but as a component integrated into life and coexisting with it, cinema becomes a highly suitable art form for making a post-digital perspective visible and contains rich potential in this regard.

In his study, which addresses the transformation of spatial perception along the axis of visual technologies through urban screens as public communication platforms, Assoc. Prof. Cem Tutar states that urban spaces, which function as a form of interface in the relationship between the individual and society, have turned into visual media surfaces. Emphasizing the need to reconsider urban spaces, which have acquired the form of simulacra in postmodern culture, in terms of their close relationship with developing communication technologies, Assoc. Prof. Tutar points out that humanity is, on the one hand, fitting the city into a screen and, on the other, placing screens inside the city. He also notes that the screenification of urban space is not limited to fixed screens; mobile technologies and location-based media systems are also transforming the urban experience.

Discussing the integration of content production, which has become faster, more flexible, and more accessible with digitalized production processes, into virtual production processes, Dr. Ayşe Okumuş states that in recent years these technologies have become widespread not only in cinema and television but also in areas such as advertising, the gaming industry, and digital content production. According to Okumuş, virtual production, with its multidimensional structure that integrates physical and digital production processes, transforms the linear production model, and reshapes creative processes through real-time technologies, brings not only advantages but also problems.

Dr. Bahadır Kapır and Merve Simay Yaver argue that the boundaries between cinema and digital games, two distinct media, have become blurred at the level of technical, viewing, and experiential practices, transforming into a new screen phenomenon. They state that digital games, which have gained function as cinematographic narrative tools, are heirs to cinema. Dr. Kapır and Yaver argue that the fact that reality is now produced through software-based tools rather than recorded has radically transformed cinema's relationship with reality, and they contend that digital games, which offer a simulated reality and position the player within a specific ideological framework, have emerged as a new field and medium.

Assoc. Prof. Ayşegül Akaydın Aydın and Research Assistant Yasir Özer state that throughout its journey to the present, cinema has interacted with many media, such as television and digital games. They indicate that from the 1990s onward, a reciprocal interaction began to develop between cinema and digital games in terms of aesthetics and narrative, including editing, narrative structure, color use, and point of view. This interaction, they note, has led to transformations in the narrative forms of both media, producing a more complex, multilayered, and interactive structure. The authors further state that since 2000, transmedia storytelling has continued by being transferred to digital platforms, and that there is a strong convergence between the two media forms not only at the thematic level but also at the formal and aesthetic levels.

In the final chapter of the book, Aybiçe Şahinler states that in the new era, in which content breaks free from traditional frameworks and becomes spatialized and biologized, broadcasting has also transformed from the act of looking at an object into a state of being within the world. She argues that the individual experiences technology not as an external tool but as a constitutive component of their own existence and of media production.

Şahinler states that in this hybrid reality, where the screen disappears, mind, body, and technology open the doors of a new era of communication as an inseparable whole. However, the author also notes that in the new ecosystem where the body becomes a broadcasting interface, the boundaries of privacy are becoming blurred, and she draws attention to the importance of bio-data privacy.

Ways of Seeing Through Changing Screen Practices, which addresses the evolution of the screen from historical, technological, sociological, and philosophical perspectives, aims to offer its readers an interdisciplinary study. I would like to extend my sincere thanks to all my colleagues who contributed to the preparation of this book and to Dr. Besna Ağın, who served as the English language editor of the book. May it reach many readers.

Assoc. Prof. Esennur SİRER
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THE NEW FACE OF DIGITAL TRANSFORMATION: THE EVOLUTION OF SCREEN CULTURE

Nursel BOLAT[1]

Introduction

The process of digital transformation has led to significant changes in media production and distribution practices through rapid developments in communication technologies. This transformation has affected not only technical infrastructures but also viewing practices and the cultural relationship audiences establish with screens. With the transition from analog broadcasting to digital broadcasting, the widespread adoption of personalized devices such as smartphones, tablets, and smart televisions has gradually replaced the culture of "single screen" viewing with a "multi-screen" experience. While this transformation has enabled audiences to move from a passive position to that of active participants, it has also made it possible to personalize content flows through algorithmic systems.

Since its emergence, television has maintained a close relationship with technological developments and has achieved significant progress in both programme production and broadcasting practices. For a long period, television preserved its central position among mass media in terms of reach and social influence. Although numerous alternative media technologies have emerged alongside developments in communication technologies, television continues to occupy an important place, particularly in developing countries. At the same time, advancements in broadcasting and internet technologies have transformed both the production and consumption of television content while accelerating the transition to the digital world. Through digitalization, television broadcasting has evolved beyond its basic functions into multilayered platforms where various media elements converge. Although television continues to preserve certain characteristics of traditional broadcasting, it has evolved into an internet-connected medium capable of integrating diverse forms of media content and functioning as part of a multiscreen narrative environment in which photographs and videos can be displayed through tablets and smartphones.

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In connection with digitalization, mass communication media have continuously evolved, changed format, and expanded their spheres of influence in parallel with emerging technologies (Akmeşe & Deniz, 2015, pp. 313–314). Within this transformation, communication technologies such as smartphones, tablets, computers, and smart televisions have introduced new screens into media environments, resulting in significant changes to traditional screen culture. Having maintained an interactive relationship with audiences for many years, television has increasingly transferred its broadcasts and program formats to different platforms and screens as digitalization accelerated. Following the 1990s, the widespread adoption of internet-based and broadband broadcasting increased the visibility of traditional television on digital platforms and social media environments. Improvements in audio and visual quality have likewise contributed to the development of infrastructures that support multi-screen consumption. This technological transformation has made it possible not only to distribute media content through the internet but also to store content and make it available to audiences whenever they choose.

Television broadcasting and screen culture have undergone significant transformation through digitalization. Content transmitted through digital codes is transferred from sender to receiver via digital infrastructures. The transition to digital broadcasting has required the establishment of specific technical systems capable of transmitting audio and visual information through these coded formats. This transformation has altered both the diversity of technological devices surrounding television and the ways in which they are used, thereby reshaping audience viewing habits. Viewers have gained access to a variety of digital tools that can be considered extensions of the programs they watch. In response, the television industry has developed second-screen applications designed to provide supplementary information and enhance audience interaction. With the rise of digital television broadcasting, viewers have increasingly utilized tablets, smartphones, desktop computers, and other smart devices as second screens, transforming the viewing experience into a more layered, interactive, and participatory process.

The Historical Journey of The Screen: From Television to The Multi-Screen Ecosystem

Photography, cinema, and television follow one another within a specific historical sequence in the development of visual communication technologies. The origins of visual representation can be traced back to cave paintings.

However, the widespread dissemination of visual content and its accessibility to large audiences became possible only after the invention of photography. The ability to record moving images and the Lumière brothers' first commercial film screening in 1895 marked the emergence of cinema and the audience's encounter with the white screen—the first modern screen experience. Television, which became widespread after these visual communication technologies, developed by incorporating many of the characteristics of its predecessors. Technological developments continue to become increasingly visible in everyday life, and as access to technology becomes faster and more affordable, these influences extend into the realm of virtual reality. Combined with the internet, expanding communication technologies have further broadened their fields of application.

In analog television broadcasting, which may be regarded as the first screen environment, audio and visual information are transmitted through voltage levels. In analog broadcasting systems, signals are conveyed continuously in waveform form; therefore, fluctuations in voltage may result in deterioration of image and sound quality or even interruptions in transmission (Sarpel, 1996, p. 5). Nevertheless, television became a powerful medium that entered homes as the "white screen," establishing a strong bond with audiences. Reaching large audiences and shaping viewing habits for decades, television eventually became integrated into the broader process of digital transformation.

Although theoretical discussions of digital media often emerge from analyses of traditional media, they provide valuable insights into the rapid changes brought about by digitization. Within this context, Baudrillard places technology at the center of his theory of simulation and discusses the transformation of the image through digitalization (2012, p. 18). Rapid developments in computer technologies facilitated the digitization and processing of images, making them easier to manipulate and distribute. Consequently, television broadcasting also shifted toward digital technologies (Morgül, 2011, p. 18). Compression techniques used in digital television broadcasting increased transmission capacity while significantly expanding the technical boundaries of broadcasting through multimedia and interactive capabilities (Kandemir, 2013, pp. 16–17). Digital broadcasting improved image resolution and quality by converting audio and visual content into computer-readable formats. As a medium with considerable social significance, television has exerted a substantial influence on viewing quality and audience experience through digital transformation (Atar, 2017, p. 355).

This process also led to the emergence of new broadcasting platforms and the widespread adoption of multi-platform television broadcasting. As a result, media content began to be delivered across multiple screens, introducing audiences to the multi-screen experience.

New media rapidly gained prominence by engaging users across different screens, repositioning television as part of what is now considered traditional media while defining itself through a multi-screen structure (Van Dijk, 2018, p. 346). Through digitalization, content and devices previously associated with analog screens were integrated into a multi-screen system via new media environments. New screens diversified into advanced televisions, computers, tablets, and mobile devices. The rise of computers, tablets, and mobile screens increased screen diversity and facilitated the growth of digital platforms specifically designed for these devices. In this context, the expansion of internet-based television broadcasting has naturally intensified competition. In an environment characterized by intensive content production, competitive advantage appears to be the key to survival (Sirer, 2020, p. 1662).

Platforms operating through Over-The-Top (OTT) technologies, such as Netflix and Hulu, allow audiences to access content whenever and wherever they choose. This development has weakened the traditional bonds established between mass audiences and conventional media institutions. By enabling viewers to access content on demand, new media eliminates the requirement of simultaneity that characterized traditional media consumption (Göker & Adem, 2011). In traditional media, content is typically consumed within a scheduled broadcast flow, and opportunities for repeated access are limited. In contrast, new media environments allow audiences to access television content at any time, removing the necessity of being present before the screen at a predetermined moment. Consequently, digital platforms have transformed the traditional single-screen culture and paved the way for a continuous, multilayered screen culture.

Changing Viewing Practices Through Digitalization

Digital platforms provide audiences with the opportunity to consume content continuously and without interruption, thereby increasing user engagement and platform dependency. This process enables media companies to cultivate long-term audience bases while simultaneously transforming media consumption habits. Platforms such as Netflix, Amazon Prime Video, and Hulu have adopted strategies centered on the continuous delivery of

content in order to maximize user retention and encourage prolonged engagement. While this strategy promotes uninterrupted viewing experiences, it also allows marketing activities within the media industry to become increasingly targeted and data-driven (Erdem, 2025, p. 129). With the emergence of digital platforms, the broadcast flow that was previously controlled by broadcasters within the framework of linear television has gradually been replaced by a viewing model based on audience preferences. This transformation has altered not only viewing methods but also viewing habits, leading audiences toward the practice of binge-watching.

Through binge-watching, the flow of content, which was previously managed by broadcasting institutions, is restructured through the interaction between audiences and Video-on-Demand (VoD) systems. In its traditional form, media flow is characterized by four primary features: it is linear, scheduled, organized according to predictable patterns of return, and structured around a specific programming logic (Williams, 2003, p. 72). On digital platforms, however, this linear and scheduled flow has largely disappeared. In its place, a new interface-based "logic of flow" has emerged. The reason this structure often remains invisible to users is that interfaces are developed through user-experience research, pilot implementations, and extensive audience data analysis. This new mode of flow incorporates the practice of binge-watching. Alongside this transformation, another concept that has become increasingly prominent in the digital era is that of the second screen.

The concept of the second screen emerged through the integration of television and interactive media and refers to the simultaneous use of multiple devices while watching television. These second-screen devices are internet-connected and designed to facilitate interaction. Tablets, computers, and smartphones can all function as second screens within this framework. Although these devices are not direct extensions of television, they can, in certain circumstances, relegate television itself to a secondary position. Discussions and interactions conducted through social media platforms can significantly alter television's role within the viewing experience. Consequently, whether a screen functions as primary or secondary depends largely on the content on which viewers focus and the devices, they choose to use (Meulenaere et al., 2015, pp. 8–9). Television therefore does not always occupy the position of the primary screen; depending on the context of use, it may also become a secondary screen. While audience preferences and content characteristics shape patterns of screen usage, audience behavior simultaneously plays a determining role in the operation of algorithmic systems. For

this reason, the influence of algorithmic recommendation systems on audience behavior has become increasingly visible in the context of digitalization.

Castells argues that interactive computer networks transform everyday life by generating new forms and pathways of communication, while technology itself develops through continuous interaction with society (2008, p. 1). Interactive applications, extensions, and algorithms embedded within digital broadcasting platforms contribute to the diversification and continual transformation of communication practices. Within this framework, new media systems analyze data derived from users' previous experiences and personalize interfaces accordingly (Sundar & Sampada, 2010, pp. 301–302). In other words, personalization processes operate through data collected by algorithms; user behaviors are analyzed, recognized, and remembered by the system, while content is reorganized according to individual preferences and needs.

Castells further emphasizes that technology does not independently determine society, just as society alone cannot determine the direction of technological development. Rather, technological evolution emerges through a complex process involving scientific advancement, individual creativity, entrepreneurship, and numerous other factors interacting simultaneously (2008, p. 6). Within this context, understanding the operation of algorithmic systems allows the influence of recommendation mechanisms on users to become more transparent and analytically accessible.

Through these algorithms, platforms such as Netflix collect extensive information about audience viewing habits, experiences, and preferences by analyzing large-scale patterns of user interaction. Because viewing practices shaped by individual preferences remain in continuous interaction with platform algorithms, behavioral changes and habits derived from viewing histories can be systematically monitored. As content preferences evolve, algorithms update themselves, accordingly, creating a structure designed to sustain audience attention and engagement within the platform environment (Özel & Özay, 2021, p. 306). In this respect, digital platforms and the data infrastructures that operate through algorithmic systems exert a significant influence on broadcasting practices, audience behavior, and contemporary screen culture.

Screen Culture in The Age of Platforms

In connection with developments in digital broadcasting, a significant increase has been observed in the number of digital television platforms. High broadcasting quality and the growing diversity of content offered to audiences have contributed to the rapid expansion of these platforms. Since their inception, digital television platforms have sought to define themselves, communicate the nature of their content, and demonstrate their advantages to audiences. With the integration of internet networks into television infrastructures, interactive television broadcasting has also begun to develop. Over time, digital television platforms have undergone a substantial transformation by offering user-centered viewing experiences and enhanced ease of use (Koyuncu, 2017, p. 326).

Accordingly, the traditional understanding of television broadcasting has experienced a profound transformation through the integration of television and internet technologies. Rapid developments in internet technologies have directly influenced digital broadcasting, leading to a comprehensive transformation extending from the ways television content reaches mass audiences to the structure of broadcasting systems themselves. New digital platforms have also generated significant changes in screen culture. As a result, digital platforms operating under the logic of contemporary broadcasting have simultaneously introduced new forms of screen aesthetics and screen culture.

The emergence of platforms such as BluTV, Netflix, and PuhuTV has created a clear distinction between traditional television audiences and digital platform audiences. Primarily targeting younger viewers, these platforms have maintained their popularity and continued to expand since their introduction.

The rise of platforms such as BluTV, Netflix, and YouTube has fueled debates regarding the decline or even the end of linear broadcasting. At the same time, online live-streaming platforms, particularly Twitch, have facilitated the reconfiguration of linear broadcasting within internet-based environments (Spilker, Ask, & Hansen, 2020; Dikmen, 2022, pp. 38–39). However, what emerges in this context is not a direct continuation of traditional linear broadcasting but rather an updated and transformed version of it.

Video-on-demand platforms such as YouTube and Netflix have established themselves as powerful alternatives to traditional television broadcasting. Twitch, by contrast, is characterized by live broadcasts scheduled at specific

times and by the ability of audiences to interact both with streamers and with one another during these broadcasts. For this reason, Twitch can be understood as a new-generation form of linear broadcasting.

Digital media platforms have transformed numerous aspects of media production, ranging from advertising practices and production processes to broadcasting strategies. The widespread adoption of social media platforms and changing user habits have also diversified preferences regarding video formats. One of the most notable developments in this process has been the transition from the traditional horizontal frame (16:9) to the vertical frame (9:16), which is more compatible with digital platforms.

The horizontal frame continues to function as a conventional format that provides a broad perspective suitable for cinematic storytelling (Kılıçbay, 2025). In contrast, social media platforms prioritize vertical framing due to their compatibility with mobile devices, offering audiences a more direct and immersive viewing experience. Nevertheless, the advantages associated with vertical framing also introduce certain limitations for television formats. Within social media environments, short-form videos presented through vertical screens expand the possibilities of interactive storytelling. In this regard, vertical screen usage has become particularly widespread in contexts where audiences simultaneously function as content creators.

Individuals who occupy the dual position of viewer and producer within digital broadcasting environments reshape internet television into a medium with its own distinctive characteristics. The presentation of television content through online video streaming and its availability in real time have generated new forms of audience experience. Accessing and consuming television content increasingly resembles navigating through interconnected content across the internet. Moreover, audiences are provided with opportunities to access supplementary information and interact directly with content during the viewing process.

The convergence of television and computer technologies has also integrated television more deeply into internet-based environments (Uluoğlakçı, 2011). New technologies offer audiences not only access to information but also significant opportunities for storing, organizing, and sharing information. Consequently, concepts such as audience, television, and broadcasting have moved beyond their traditional definitions and acquired new meanings.

The emergence of new television viewing platforms through digital transformation has inevitably altered viewing habits and redefined the concept of the audience itself. As Castells particularly emphasizes, the transformation of audiences from passive recipients into interactive subjects has generated substantial changes in media use. Alongside this shift, the weakening of centralized control over mass communication media has reinforced tendencies toward fragmentation, individualization, and personalized content production (2008, p. 451). This new environment contributes to the diversification of information flows while simultaneously facilitating broader social, economic, and cultural transformations.

As internet technologies have become increasingly embedded in everyday life, the formation of what Castells describes as the "network society" has accelerated. The network society refers to a new social structure shaped by accessibility through information and communication technologies. Within this structure, the widespread use of social media platforms actively involves individuals in content production processes while simultaneously positioning them within forms of invisible labor.

Unlimited access to information contributes to transformations in perceptions of time and space while increasing the amount of time spent in front of screens. In this context, social media and digital platforms redefine the relationship individuals establish with screens, creating the conditions for the emergence of a new screen culture organized around the concepts of the viewer and the user.

The Social and Cultural Impacts of Screen Culture

The transformation brought about by digitalization has not only altered media technologies but has also reshaped social and cultural life. Screens, which once functioned primarily as tools for communication and entertainment, have increasingly become central components of everyday experience. As digital technologies have become more deeply integrated into daily life, the amount of time individuals spend interacting with screens has expanded significantly. This transformation has affected social relationships, cultural practices, identity formation processes, and perceptions of reality.

The widespread use of digital technologies has fundamentally transformed the ways individuals communicate, access information, and participate in social life. Through internet-connected devices, users are able to maintain continuous communication regardless of geographical boundaries. Social media platforms, digital broadcasting services, and online communication

networks have expanded opportunities for interaction while simultaneously redefining the meaning of social presence.

The increasing integration of screens into everyday life has generated a social environment in which individuals are almost constantly connected. Smartphones, tablets, computers, and smart televisions provide uninterrupted access to information and communication, creating what can be described as a culture of permanent connectivity. Within this environment, individuals are exposed to a continuous flow of content, notifications, and interactions. While this situation enhances access to information, it also contributes to issues such as information overload, distraction, and fragmented attention.

Digital screen culture has also transformed traditional understandings of time and space. Through digital technologies, communication can occur instantaneously regardless of physical distance. The distinction between public and private spaces becomes increasingly blurred as social interactions are transferred into digital environments. Activities that were once confined to specific physical locations can now be performed through digital interfaces, resulting in new forms of social participation and cultural engagement.

The cultural effects of screen culture are particularly evident in the production, circulation, and consumption of media content. Digital platforms enable content to circulate globally within very short periods of time, allowing cultural products to reach audiences far beyond their original context. Local narratives can gain international visibility, while global media products can be adapted and interpreted within local cultural settings. This process contributes to both cultural diversity and cultural homogenization.

The increasing role of algorithms in content distribution has further transformed cultural consumption practices. Recommendation systems personalize content according to users' preferences, viewing histories, and behavioral patterns. Although such systems facilitate access to content that aligns with individual interests, they may also limit exposure to alternative perspectives and contribute to the formation of filter bubbles and echo chambers. Consequently, audiences may encounter increasingly homogeneous information environments that reinforce existing preferences and beliefs.

From a social perspective, screen culture has encouraged the emergence of new forms of participation. Users are no longer merely consumers of media content but also active producers and distributors of information. Through social media platforms, individuals create content, share experiences, and

participate in public discussions. This transformation has altered traditional distinctions between producers and consumers, giving rise to participatory cultures characterized by interaction and user-generated content.

At the same time, the growing centrality of screens has generated concerns regarding dependency, social isolation, and the quality of interpersonal relationships. Extended periods of screen exposure may reduce face-to-face interaction and contribute to changes in social behavior. While digital communication technologies facilitate connection across distances, they may also create forms of social engagement that differ significantly from direct physical interaction.

The expansion of screen culture has also influenced identity construction processes. Digital environments provide individuals with opportunities to present themselves, experiment with different forms of self-representation, and construct multiple identities across various platforms. Social media profiles, digital avatars, and online personas enable users to shape how they are perceived by others. Consequently, identity increasingly becomes a dynamic and ongoing process mediated through digital interfaces.

In this context, the screen should not be understood merely as a technological device but as a cultural environment through which social relationships, cultural practices, and individual identities are continuously produced and negotiated. The social and cultural consequences of digital transformation therefore extend beyond technological change, influencing the ways individuals understand themselves, relate to others, and participate in contemporary society.

Digital Body and Screen Relations

One of the most significant outcomes of digital transformation has been the reconfiguration of the relationship between the human body and technological interfaces. As screens have become increasingly embedded in everyday life, interactions between individuals and digital technologies have intensified, giving rise to new forms of embodiment and new understandings of the body. In this context, the body is no longer merely a biological entity but also a digitally mediated presence that operates across multiple technological environments.

The widespread adoption of smartphones, tablets, wearable devices, virtual reality systems, and augmented reality applications has fundamentally altered how individuals perceive and experience both themselves and their surroundings. Through these technologies, bodily experiences increasingly

occur within environments mediated by screens. As a result, physical presence and digital presence have become intertwined in unprecedented ways.

The concept of the "digital body" emerges from this transformation. The digital body refers to the representation, extension, and reconstruction of bodily existence within digital environments. Through social media profiles, avatars, virtual identities, and digitally mediated forms of self-presentation, individuals establish alternative modes of presence that extend beyond the limitations of physical space. These representations enable users to construct, modify, and perform identities in ways that may differ from their physical selves.

The development of screen-based technologies has accelerated the integration of digital environments into everyday bodily practices. Activities such as communication, work, education, entertainment, and social interaction increasingly take place through digital interfaces. Consequently, screens function not only as communication tools but also as extensions of human perception and experience. The body interacts with the world through these interfaces, while technological systems simultaneously shape how reality is perceived and interpreted.

The relationship between screens and the body can also be examined through the concept of embodiment. As digital technologies become more intuitive and seamlessly integrated into daily routines, the visibility of the technological interface itself often diminishes. Users increasingly focus on the content, interaction, or experience rather than the device through which these activities occur. In this sense, technologies become incorporated into bodily practices and gradually function as extensions of perception.

At the same time, digital technologies contribute to the emergence of new forms of visibility. Individuals continuously produce images, videos, and personal content that circulate across digital networks. The body becomes a central element of online self-representation, while digital platforms create environments in which visibility acquires social, cultural, and economic value. Consequently, bodily presence is increasingly shaped by platform architectures and algorithmic systems.

The growing integration of digital technologies into bodily experience has also generated discussions concerning surveillance, privacy, and data collection. Through wearable technologies, biometric systems, mobile devices, and online platforms, vast amounts of personal data are continuously generated and recorded. As a result, the body becomes both a site of experience

and a source of data within digital ecosystems. Information related to movement, location, health, consumption patterns, and communication habits is increasingly incorporated into algorithmic systems.

From a broader theoretical perspective, digital transformation has challenged traditional distinctions between physical and the virtual. Rather than existing as separate domains, physical and digital realities increasingly intersect and overlap. Individuals participate simultaneously in both environments, creating hybrid forms of presence that combine embodied experience with digital interaction. This development has encouraged scholars to reconsider established understandings of identity, subjectivity, and embodiment.

The relationship between the body and screens also reflects broader transformations associated with contemporary digital culture. Screens have become central interfaces through which individuals access information, maintain relationships, construct identities, and participate in social life. As digital technologies continue to evolve, the boundaries between the body and technological systems are likely to become increasingly fluid.

In this context, the digital body should be understood not as a replacement for the physical body but as an extension of it. Digital technologies expand the possibilities of communication, representation, and interaction while simultaneously introducing new forms of dependency, surveillance, and control. Consequently, the relationship between screens and the body constitutes one of the defining characteristics of contemporary digital society and remains a crucial area for understanding the ongoing transformation of screen culture.

Conclusion

Within the context of digital transformation, the screen has evolved beyond its function as a technological display device and has become one of the fundamental cultural interfaces of contemporary society. The traditional television model, characterized by linear, centralized, and time-bound broadcasting, has gradually transformed into an internet-based screen culture shaped by on-demand consumption and multi-platform accessibility. This evolution of screen culture has generated new networks of power operating through data mining, algorithmic recommendation systems, and personalized content flows. In this process, audiences have increasingly become active participants who can contribute to content production and engage in the circulation of media. At the same time, their viewing habits have become measurable, analyzable, and subject to algorithmic influence. Consequently, the

contemporary digital screen experience is characterized by ongoing tensions between participation and surveillance, freedom and control, and individualization and algorithmic guidance.

The transformation of the screen has also reshaped forms of cultural representation and processes associated with the digital body. Through digital platforms, the circulation of diverse cultural content has accelerated, enabling local narratives to gain visibility on a global scale. At the same time, algorithmic systems that prioritize similar forms of content have contributed to the emergence of filter bubbles and echo chambers, fostering the development of distinct screen cultures and segmented media environments. As a result, screen culture has introduced significant changes in the ways audiences engage with screens when compared to the linear broadcasting era. New viewing practices such as binge-watching have transformed narrative structures and storytelling conventions, demonstrating that screen culture not only alters modes of consumption but also actively reshapes narrative aesthetics.

The evolution of screen culture represents more than a technological transformation; it reflects a multilayered process of social and cultural change. In contemporary digital society, the screen functions as a field of power positioned at the intersection of individual experience and collective cultural organization. Understanding screen culture has therefore become essential for analyzing contemporary media systems, digital publics, and the changing relationship between individuals and technology.

As the new face of digital transformation, the screen has become both a reflective element and a constitutive component of contemporary society. Examining screen culture provides a crucial analytical framework for understanding the structure of today's media environment, the dynamics of digital public spheres, and the evolving nature of human-technology interaction. In this regard, the evolution of screen culture facilitates the transformation of audiences into users, moving from simple viewing habits toward generations increasingly shaped by screen-based experiences and societies deeply integrated with digital technologies.

Furthermore, the widespread adoption of screen-connected technologies and the increasing intensity of screen-mediated interaction have accelerated the emergence of new understandings of the digital body. As digitalization continues to reshape everyday life, screen culture itself remains in a constant state of evolution, creating conditions for the emergence of new concepts,

practices, and theoretical perspectives. The ongoing transformation of screen culture will therefore continue to play a defining role in shaping media experiences, social relations, and cultural life in the digital age.

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YOUTUBE AS A PRAXIS FIELD

Esennur SİRER[1]

Introduction

"In the postmodern period, knowledge ceases to be the bearer of holistic truths and proceeds within a structure that circulates across digital networks and becomes datafied" (Lyotard, 1997, p. 20). In this age, in which knowledge is mediated by informatics, the flow of information takes place through internet-mediated screens. Entertaining content, or the presentation of content through entertainment, functions as a way of inviting the viewer participating in the flow into the content. In recent years, a large part of everyday life has been spent looking at screens. With the ringing of the phone alarm in the morning, the digital screen that greets the individual remains by their side throughout the day. Beyond this, there are screens everywhere: in the metro, in cars, on streets, at school, and in the workplace. This is because the screen is a window opening onto the outside world. Television, the first of these windows, opened a new door in the life of the individual. Unlike the cinema screen that preceded it, television was the first screen controlled by the viewer. Tele-vision, which is said to bring the distant near, became, as Manovich emphasizes, the first window opening outward in real time. At the same time, this window also created spatial depth, functioning as a two-dimensional control interface that enabled information to flow and to be continuously updated (2001).

With the internet, as the number of windows in the individual's life increased, people began to look through more than one window. Shortly after the period known as Web 1.0, during which documents were followed, humanity began to produce content directly and to share the content it produced through the computer screen. In the period called Web 2.0, which began in the 2000s, human beings experienced individual content production and communicated through four different screens: television, computer, tablet, and phone. In the 2010s, as humanity closed the knowledge gap, it experienced entering into the window through Web 3.0. During this period, thanks to AR applications and wearable screens, human beings were able, for the first time in history, to look both inside and outside.

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In the Web 4.0 period, the virtual world behind the window was experienced for the first time (Sirer, 2019). In other words, individuals first saw, then controlled, then touched, and finally experienced living inside. Following this period, in which we physically interact with machines, it is predicted that screens will become an extension of our bodies in the age in which we communicate cognitively. Today, the screen, which still maintains its magic, draws the individual in with the images, sounds, and colors on its visual interface. In a field of experience where the boundaries between the digital world and the physical world are gradually dissolving, Homo Screenus's use of time, attention dynamics, and social relationships are also being transformed (Başbuğ and Akdaş, 2025, pp. 268, 493).

Internet-mediated television broadcasting has begun to occupy a central position in the media ecosystem at both local and global scales. With the flexibility, accessibility, and data-based content production opportunities offered by digital technologies, this media form has become not only an alternative form of traditional broadcasting but also part of its evolution (Valimatov, 2025, p. 265). In this context, the digitalization of television and its transformation through new media should be considered not only in relation to hardware but also together with content and distribution systems. Television forms and experiences that seemed impossible for the distribution mechanisms of traditional television, in which a single institution sends a single program to everyone, have changed thanks to broadband technology. This situation allows viewers not only to personalize the content offered to them but also to choose what they watch and when they watch it (Lotz, 2016).

In the new broadcasting model gathered under the umbrella of web television, the first alternative to traditional television broadcasting was IPTV, or Internet Protocol Television. IPTV is a system within a closed network structure in which, in addition to traditional television flows, different kinds of content can be purchased, programs can be recorded to be watched at the desired time, online streaming can be paused while viewing, and broadcast quality is guaranteed. With the development of broadband technology and the increase in video streaming speed, OTT services, which use the open internet, reached similar broadcast quality, making it possible to access broadcasts from all over the world. First, global platforms such as Netflix, Amazon, and Disney, and later local platforms, reached audiences through content libraries and low monthly subscription systems.

In his 2018 Open TV Manifesto, Aymar Jean Christian states that twenty-first-century television is an example of integration rather than diversification, and that promises of openness have been swallowed by traditional television companies such as Disney and Warner Media, as well as by other conglomerates such as Amazon and Apple (Boyle et al., 2025). In the past, local broadcasting was easier than international broadcasting. Local broadcasters were in an advantageous position compared to international cable and satellite TV networks, which struggled against the flow of national cultures with limited knowledge and technology. Today, however, local broadcasters are disadvantaged against broadcasting giants that effortlessly cross borders by combining international network effects, internet-supported technologies, and global supply-chain coordination. The broadcasting industry worldwide is characterized by the dominance of a few giant companies, such as Netflix, Amazon Prime Video, and Disney+, which hold a large share of the market. These companies are not only the largest globally but have also reached a dominant and advantageous position in almost every country in which they operate (Chalaby, 2025).

The possibility of individual content production during the Web 2.0 period constituted another breaking point in television broadcasting. The increase in video streaming speed, together with the possibility of broadcasting easily and cheaply, paved the way for social media broadcasting. In the United States, which has dominated the online entertainment scene for the last twenty years, Netflix-like platform broadcasting, designed as a new global service television, has been defeated by YouTube-like social media broadcasting (Cunningham & Craig, 2016, p. 5409). With its structure that contains various genres and formats, its interactive interface, and its infrastructure that enables individual content production, YouTube has created a new broadcasting ecosystem. YouTube-like broadcasting platforms that prioritize individual production have diversified the field of action and created a new field of praxis.

At the point reached today, in an environment where global dominance in broadcasting content is steadily increasing, infrastructure has turned into an internet-mediated structure, and convergent technologies are used as hardware, analyzing the current situation is important for identifying future possibilities. This study, conducted through the literature review method, addresses the transformation of television broadcasting in the context of screen technologies.

The Television Screen

Etymologically meaning a protective barrier, the screen protects us by capturing reality in the form of images. We are now in a period in which we perceive reality almost entirely through digital screens (Han, 2024, p. 57). The screen can be evaluated from sociological, commercial, artistic, and historical perspectives as both an object and a form of communication. The word "screen," said to derive from the French word *écran*, has existed for centuries in many languages with meanings such as protecting, concealing, and dividing. For instance, fireplace guards were also called screens. The use of the word in relation to media and communication emerged toward the end of the nineteenth century. Although media screens are mostly associated with indoor spaces — the cinema screen in public space, and the television and personal computer screen in private space — the first screen used by human beings was the sky.



Figure 1. The Sky Projector at the 1893 Chicago World's Fair
(from Huhtamo's collection)

Sky projections and magic lanterns, as has often been the case in the history of technology, were first imagined and then brought into existence. In 1893, at the Chicago World's Fair, images were projected onto clouds as a large screen by using large lenses with suitable focal lengths. Today, mobile screen-based devices, from mobile phones to personal digital assistants, from iPods to portable game consoles, and even large outdoor screens in cities, have increasingly become one of the most important parts of life (Huhtamo, 2009, pp. 329–335). The screens on which films were shown a

century ago have now been replaced by digital screens that are before our eyes almost every hour of the day.

Although screens are two-dimensional surfaces, the impression of a three-dimensional reality accessible through the screen now serves as a feature that carries humanity into a third dimension and offers a different experience, including through artificial intelligence products and augmented reality systems. A journey into a different and intriguing dimension has always attracted attention. The history of the screen is full of examples that, throughout the ages, have created bridge experiences between reality and the virtual (Eken, 2019, pp. 532–540). Individuals are fascinated by screen experiences into which the physical world is articulated, and they spend a great deal of time in this space. The most interesting aspect of this experience is that individuals can interact through sound and image.

The television screen is the first screen that carried the magic box from the public sphere into homes. It was positioned in the most prominent place in the home so that it could spread its magic. The first successful image transmission called television was carried out by an engineer named John Logie Baird in London in 1926. The "first television broadcast" in the world was transmitted by the broadcasting organization NBC from New York to Washington in 1928. In 1931, NBC began its first experimental television broadcasts. The broadcasting of the Olympic Games held in Berlin, Germany, in 1936 was an important turning point. Subsequently, 20,000 people around London watched the broadcasts launched by the BBC on November 2, 1936 (Jeanneney, 2006, p. 261). With the beginning of television broadcasting, a new social and cultural structure emerged from the perspective of viewers, and television programs were created in different genres to meet viewers' desires and expectations (Bolat, p. 79).

Television is described not merely as a physical device but as a media order in which distribution and experience converge (Lotz, 2017, p. 25). The television set, which entered homes around the world beginning in the 1950s, also came to be referred to as broadcasting itself, which at the time meant the combination of infrastructure, hardware, and content. In the first quarter of the twenty-first century, developing infrastructural possibilities, user-oriented innovations in hardware technologies, and the evolution of content production from a centralized model into a dispersed structure have also transformed television broadcasting. In this period, when everyone can find a medium through which to broadcast and content production proceeds

in a popularity-oriented manner, television broadcasting has been reduced to the dimension of the screen. Traditional television broadcasting, which occupies an important milestone in the history of audiovisual broadcasting, has formed a model, perhaps even a template, for social media-mediated broadcasting. According to Jan van Dijk, "television built bridges between the lives of people living in different physical and informational spaces. The internet has gone one step further by offering the opportunity for direct integration and connection among people or environments that both share the same origin and differ from one another" (2018, p. 263). According to media professionals specialized in different areas of the television sector, television, which adapts quickly to new technologies, will continue to exist in the future as its mode of broadcast transmission changes (Ersin, 2023, p. 1228).

The most important transformative effect of digital broadcasting has undoubtedly been that it has turned television from a device that is watched into a device that is used. Broadcasting, which has developed in integration with the field of informatics, has removed restrictions in content production, transmission, and access, thereby improving the broadcast quality of television and shifting control over content from the broadcaster to the viewer. Viewers have gained opportunities such as watching the broadcasts they want from wherever they want, rewinding them, and watching them again (Kuyucu, 2021, p. 228).

Although television and social media continue to exist as two separate media, the symbiotic relationship between them continues. It is not plausible to think that OTT broadcasts, described as platform broadcasting, and social media-mediated broadcasting will swallow all old media. The new broadcasting system is still under construction, and at its foundation it contains the codes of traditional broadcasting. On the other hand, traditional television broadcasting, which is rapidly losing blood, is trying to survive by serving its content through social media. In a study I conducted in 2024, as a result of a one-month analysis of YouTube Shorts videos, I found that 136 of a total of 280 pieces of content, in other words 49 percent, were produced from traditional television broadcast content. Based on this, I concluded that social media, which deconstructs the media that preceded it, is nourished by traditional television broadcasts through its structure shaped by instant likes and through rhizomatic content created to increase the act of viewing (Sirer, 2024 İFİG). In a period in which technology shapes broadcasting, even two

years can be perceived as a long time. During this period, social media broadcasting appears to have begun taking shape.

History Is Just Beginning

Twenty years after Francis Fukuyama declared the end of history, Manuel Castells stated that history was just beginning (Castells, 2008, p. 632). During the process in which neoliberal policies prevailed, media became the leading actor of social regulation. The first dominance of this period in the field of media was experienced through the television screen. The ability to broadcast everywhere in the world through satellites turned the world into a global village. Over the years, the distances reached with the help of technology also changed content. In a study evaluating the transformation of program content at the levels of broadcasting and platforms through television series, common characteristics were identified by period as follows:

Public-Monopoly Period: Collective consciousness, real identity, strong family representations, physical spaces, sequential narrative.

Commercial-Liberal Period: Group consciousness, semi-real consciousness, fragmented family representations, physical-fictional spaces, sequential and non-sequential narrative.

Digital-Personalized Period: Individual consciousness, virtual identity, weak family representations, hybrid spaces, non-sequential narrative (Yılmazkol, 2025, p. 456).

As can be seen in many studies addressing the media representation of social structure, media paved the way for the process leading toward social individualization. At the point reached today, individualization has come to the fore not only in narrative but also in viewing habits. While programs were broadcast on traditional television within a fixed flow and through a limited form of communication, with the process of digital transformation the television viewer encountered interactive and relatively freer experiences. As a result of this transformation, viewers' content consumption habits have radically changed, and personalized viewing experiences have come to the fore (Bağcı, 2025, p. 323). From the perspective of content producers, evaluating media separately rather than only in competition with one another has gained importance in terms of the diversification of broadcasting.

Alongside traditional television broadcasting, which has continued up to the present, internet-mediated television is also being shaped within a structure that combines different technological systems and service models. It has long been accepted that the economics of television generally involve high costs. Because content production costs in particular are high (Doyle, 2016, p. 3), digital platforms and social media television, described as internet broadcasting, are replacing the traditional television model by offering new ways of accessing, consuming, and interacting with content. Thus, digital technology has opened new windows for television content and has changed the nature of the traditional television window.

"The digital distribution of television content over the internet and the accessibility of content across multiple platforms have brought with them new developments concerning the production, distribution, and financing of television programs in the new media period" (Kuyucu, 2021, p. 287). The viewing of television through internet infrastructure has brought many changes. A larger share of internet-connected adults worldwide, 73.5 percent, watch "traditional" television, while the share of those watching streaming platforms is 69.9 percent. In addition, OTT broadcasting services now account for more than half of internet users' total TV viewing time, at 50.4 percent (We Are Social, 2026). These data show that the internet is used as infrastructure and that the number of those watching platform broadcasts has caught up with traditional broadcasts; these broadcasts constitute half of the time spent on the internet.

Although broadcasts made through the internet may be watched on the same hardware, there are differences in terms of content and infrastructure transmission. These services, gathered under the umbrella of Web TV, are divided among themselves.

IPTV

The first experiments in internet television were realized through IPTV, or Internet Protocol Television. As in the rest of the world, in Türkiye a closed internet network whose speed is guaranteed by internet service providers is needed in order for video streaming services to be delivered in accordance with broadcasting criteria. A contract, that is, a protocol, is established between service providers that guarantee the service and viewers over the fee to be paid. In the IPTV system, which takes its name from this protocol, an IPTV-compatible smart television, a media player or set-top box, a remote control, and an internet connection with a minimum speed of 3 Mbit/s are

required in order to watch the broadcast. Recently, IPTV applications can be downloaded directly from the app store on many smart televisions. Although an external device is not needed (Valimatov, 2025, p. 257), IPTV services can be accessed only within the country where the service provider is located. In Türkiye, IPTV applications such as Tivibu, Turkcell TV+, and Vodafone TV have been providing service for more than approximately twenty years.

Although IPTV's features, such as recording broadcasts, pausing and watching later, and rewinding and fast-forwarding, are attractive to viewers compared with traditional television, the direction has shifted toward OTT broadcasts for reasons such as the fact that fiber-optic infrastructure does not support broadcast quality everywhere, as well as economic reasons such as fees paid per device. In this regard, the possibility of accessing high-quality SVOD services as a result of cheaper internet access and increased speed, content downloaded without delay from distributed geographic servers, and alternative AVOD services such as YouTube have supported OTT broadcasting.

IPTV and OTT are television broadcasting systems that are often confused but are not the same. In IPTV, television broadcasts are made through a closed and controlled network, and a fee is charged in return for the guaranteed quality and service provided. OTT TVs are more niche televisions that broadcast at lower cost. With the development of internet infrastructure, their number and quality are steadily increasing (Sirer, 2019, p. 1049).

OTT

OTT, or Over-the-Top Television, is a term used to refer to viewers' direct access to broadcast content over the internet. The precursors of OTT services consisted of semi-amateur broadcasts established through the private initiatives of companies and used to share company-owned content. Later, with the increase in online video streaming speed, broadcast-quality transmission over the open internet became possible. Unlike traditional television broadcasting, online television broadcasting over the internet has certain advantages.

a. Convenience: Online streaming services allow users to watch their favorite programs and films without advertisements whenever and wherever they want. In addition, users can access traditional television content online and watch it independently of time and place. Online streaming services can

be accessed from every screen, including smartphones, tablets, smart TVs, and game consoles, and from anywhere in the world.

b. Cost: Many online streaming services are more affordable than traditional cable or satellite subscriptions, which makes them an attractive option for consumers. In online broadcasting services, users generally do not need to sign long-term contracts. This makes it easier for consumers to switch between services or cancel their subscriptions if they no longer need them. Some online streaming services offer packages that include multiple services at a discounted price, allowing users to access a range of content at a lower cost. In addition, equipment rental or activation fees are not charged. Factors such as these contribute to the affordability of online streaming services.

c. Content: Online streaming platforms offer a wide library of popular programs, films, and original content produced specifically for platforms. Some globally known streaming services, such as Netflix, Amazon Prime Video, Hulu, and Disney+, reach their users easily through a web browser or a dedicated application on their devices. Digital broadcasting platforms produce more diverse content that appeals to viewers' interests compared with traditional media. Mainstream television channels have also not remained indifferent to this change and transformation and have established their own internet platforms. For example, the state television broadcaster TRT broadcasts its old and new programs on the platform it established under the name "Tabii" (Diren, 2024, pp. 81–82).

d. Personalization: Many online streaming services use data and algorithms to recommend content to users based on their viewing history. This is done by analyzing user data such as viewing history, search history, ratings, and similar information. The use of machine learning algorithms and the making of recommendations based on this information are operated with a focus on increasing user engagement and satisfaction.

e. Global access: Online streaming services offer global access by reaching users all over the world. This makes it possible for people to access content that is not available in local markets for various reasons, such as licensing restrictions, regional censorship, or differences in local preferences. As a result of the removal of geographical barriers through online streaming services, a more inclusive viewing experience is provided from all over the world.

These factors contribute to the rapid growth of online streaming services and the transformation of the television industry, creating new opportunities for traditional television service providers, content creators, and advertisers.

The best-known OTT TV applications in the world include Netflix, Now TV, Hulu, Wherever TV, iTunes, YouTube, and Amazon. These platforms can be accessed through hardware such as game consoles, smart TVs, set-top boxes, Blu-ray players, and mobile devices (Karaduman, 2017, p. 121). However, treating all content delivered over broadband simply as "OTT," regardless of business model, overlooks the difference. For example, both YouTube and Netflix deliver video content over broadband, but the nature of their content and their business models distinguish them as broadcasters competing in different areas (Lotz, 2016). OTT services, which operate without the need for traditional broadcasting infrastructures such as cable, satellite, or terrestrial broadcasting, are divided into three economic business models:

Subscription Video on Demand Services — SVOD: This is the model in which users subscribe to a platform for a specific fee and gain unlimited access to the content offered during the subscription period. National and international platforms such as Netflix, BluTV, Disney+, and HBO Max, which provide a continuous revenue stream, belong to this group.

Advertising Video on Demand Services — AVOD: This is a broadcasting model in which users can access content free of charge but encounter various advertisements while watching. AVOD, an effective model for platforms such as YouTube that aim to reach a large user base, offers viewers a low-cost alternative while earning revenue from advertising.

Transactional Video on Demand Services — TVOD: This is a broadcasting model used by platforms such as Apple iTunes and Google Play Movies, in which users pay individually only for the content they want to watch. It offers either a one-time viewing option, through rental, or permanent access, through purchase (Valimatov, 2025, pp. 257–258).

On the other hand, OTT platforms have fragmented traditional television and the perception of television as the shared screen of the family by changing personal viewing habits, making them independent of time and place, and leaving access to wide-ranging content at lower cost entirely under the control of the viewer on a global scale. The rating, which measured viewing rates in traditional television broadcasting, has now become history. For broadcasters providing SVOD services, viewer behavior has become

commercially valuable information that is too important to be disclosed. Similarly, the information publicly shared by broadcasters providing AVOD services, such as YouTube, is limited only to viewing numbers. This situation makes it possible for platform broadcasters to operate free from elements such as transparency and accountability.

Social Media Television

Media, which traditionally performed a mediating function among people, communities, institutions, and industry, homogenized culture through the content it disseminated via a small number of media companies. However, over the last few decades, within a culture shaped through platforms such as social media — Flickr, YouTube, MySpace, and LiveJournal — individuals, communities of interest, and values have gained greater visibility (Jenkins & Deuze, 2008, pp. 5–7). Social media platforms have become an important part of the television viewing experience by allowing viewers to share their opinions, react in real time, and participate in online communities. Many viewers now use social media platforms as a second screen while watching television, sharing their opinions and reactions in real time. Interactive platforms that offer a social viewing experience have, over time, become centers where viewers can share their thoughts, interact with others, and engage in discussions about content. In addition, they have become a medium through which advertisers and sponsors can reach viewers and promote their content. They have also created new opportunities for production companies to promote their programs and films and generate interaction.

Social media exists within everyday life through many different platforms and applications. These platforms open up a space for socialization in addition to serving as media for content sharing, advertising, and promotion. Considering the different social needs of different individuals, the spread of digital distribution and the rise of SVOD windows have created opportunities for expanded temporal access and niche products over the internet. Yet at this point, the difficulty of producing content has emerged. This is because the target audience has fragmented, but the size of the market has not changed (Doyle, 2016, pp. 6–7). In increasing financial returns, non-quantitative data such as sustainability and the ability to convey various cultures and stories through the screen are important alongside quantitative criteria such as audience numbers (Boyle et al., 2025). This is because individuals need stories in order to know themselves, understand themselves, and conduct their relationships with the society in

which they live. The television screen, as a carrier of cultural values, is a treasure for establishing a connection with the past. Social media-mediated television performs precisely this function. It is something the individual desires to encounter others like themselves on the platform where they exist. Playing the leading role in one's own story rather than watching the story of the other is appealing.

The Convergence Space of Traditional and Social Media: Youtube

The video-sharing platform YouTube was founded on February 15, 2005, in the garage of a house by three PayPal employees named Steve Chen, Chad Hurley, and Jawed Karim. Due to financial problems, they filmed their first video on April 23, 2005. The first test video uploaded to the platform by Jawed Karim, titled "Me at the Zoo," was an 18-second broadcast from a zoo. One and a half years later, in October 2006, YouTube.com was sold to Google for 1.65 billion dollars (Onedio.com, 2026). By removing the barriers to sharing individual content, YouTube has preserved its status as the largest platform reaching the whole world. The name of the platform consists of the combination of the English words "you" and "tube." In American English, the word "tube" is used metaphorically for television, while the word "you" points to the individual who both produces and consumes content. The platform's first logo also placed the word "Tube" inside a red box in a form that evoked the traditional television screen (Başbuğ and Akdaş, 2025, pp. 317, 320).

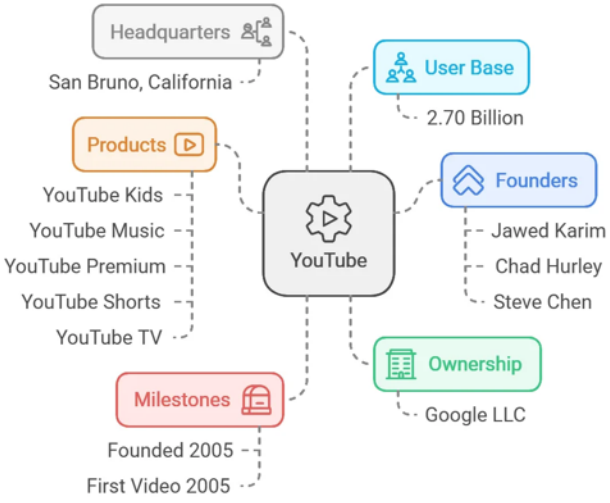


Figure 2. YouTube Overview

Since its foundation, YouTube has created a pool of knowledge and content in every field, from education to art, from science to personal development, in order to break down the perception of itself as merely an entertainment platform. This means that users can access personalized content suited to their interests. However, because of its management structure and monetization model, it does not seem possible for YouTube to implement the concept of the niche in its full sense. YouTube's concept of the niche can be considered in the context of content adapted to demographic characteristics. Studies have found that channels converge over time around similar content categories, which are commercially attractive and advertiser-friendly areas such as beauty, food, gaming, and fashion. This naturally points to isomorphism in terms of content niches (Ormen & Gregersen, 2022). YouTube is a business model in which the monetization model is incentivized through video content and advertising strategies, and the goal is to reach a broad audience. Although there are different categories, the greatest concentration is seen in hobbies at 16 percent, music at 15 percent, daily life at 13 percent, and gaming at 13 percent. The most frequently watched content types on YouTube are music, entertainment, and education (GMI, 2026).

YouTube's relationship with OTT TV goes beyond its being merely a content-viewing platform; it has turned into a dynamic ecosystem that shapes the interaction between content producers and viewers. Individuals can create YouTube channels and earn income by sharing videos through their channels. This is YouTube's most striking feature. YouTube has become an important milestone in the changing habits of digital media production and consumption in the field of OTT TV. The legal and ethical regulations it applies on a global scale enable the platform to function as a responsible media tool (Valimatov, 2025, pp. 262–263).

In *The Culture of Connectivity: A Critical History of Social Media*, José van Dijck positions YouTube as a key turning point in participatory culture, in which users cease to be passive viewers and become active content producers (van Dijck, 2013, p. 109). In this transformation:

a. Democratization of Content Production: YouTube transformed video broadcasting, formerly monopolized by professional studios, into an amateur format accessible to everyone. According to the latest data from Social Blade, 720,000 hours of new video are uploaded to YouTube every day.

b. User Participation: The foundation of participatory culture is that users do not only watch videos but also comment on them, share them, tag them, and create communities by producing their own content. As of May 2026, more than 2.7 billion people worldwide use YouTube every month, and people around the world watch YouTube on their televisions for an average of more than 1 billion hours.

c. Professionalization: The platform, where professional productions are increasingly growing, has more than one hundred local versions in more than eighty languages. According to the Digital 2026 Global Overview Report, YouTube's potential advertising reach has reached a total of 3.35 billion users (GMI, 2026).

d. Platformization: YouTube has become one of the largest social media platforms proving that user-generated content, or UGC, can be transformed into commercial value and a network of social interaction. The most-watched video to date is the song "Despacito," performed by Puerto Rican artist Luis Fonsi and rapper Daddy Yankee, released on January 12, 2017, and viewed 6.1 billion times. The music video for PSY's song "Gangnam Style," released on July 15, 2012, has also reached nearly 2.1 billion views (Onedio.com, 2026).

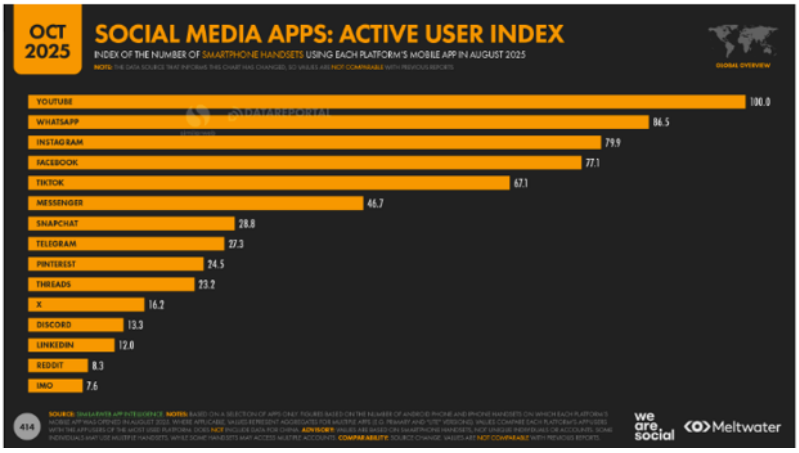


Figure 3. Social Media Platforms Active User Index (Slide 425)

These data show that YouTube is by far the leader among the world's most popular social media applications in terms of the number of active users. WhatsApp ranks second in this data set with an index score of 86.5. This figure shows that YouTube's active app user base is more than 15 percent larger than that of its closest competitor. Instagram ranks third with 79.9 points, while Facebook ranks fourth with 77.1 points. TikTok ranks fifth in

this ranking based on the number of active users of platforms' mobile applications worldwide. In light of the data, it is seen that YouTube has almost 50 percent more active users than TikTok (We Are Social, 2025). YouTube launched Shorts, its short video format lasting less than one minute, in September 2020. This format grew rapidly and reached 2 billion monthly active users as of July 2023 (YouTube.com). According to Chalaby, as the number of participants in a social media network increases, the likelihood of finding interesting posts and, accordingly, the time spent on the platform also increase through direct effects. Indirectly, the more users a platform attracts, the more advertisers increase their presence on the social network, which enables more influencers to profit from their posts (2025).

YouTube has come to the fore because it is a social media platform where content production and sharing are easy. Its advantage over traditional global media stems from its offering far more content, content creators, service providers, languages, and cultural diversity. On the other hand, it provides access to far more people than television platforms offering SVOD services. For example, Netflix, which describes itself as "the birth of a new global internet TV service," has a considerably lower number of subscribers when compared with YouTube (Cunningham and Craig, 2016, p. 5409). YouTube is also becoming increasingly important in terms of television viewing time and advertising opportunities. According to data from the Nielsen research company, YouTube has the largest share of television viewing time in the United States, accounting for 13.1 percent of total television viewing time in the United States as of August 2025. Disney ranked second with 9.7 percent, while Netflix ranked third with 8.7 percent (Pabst, September 2025).

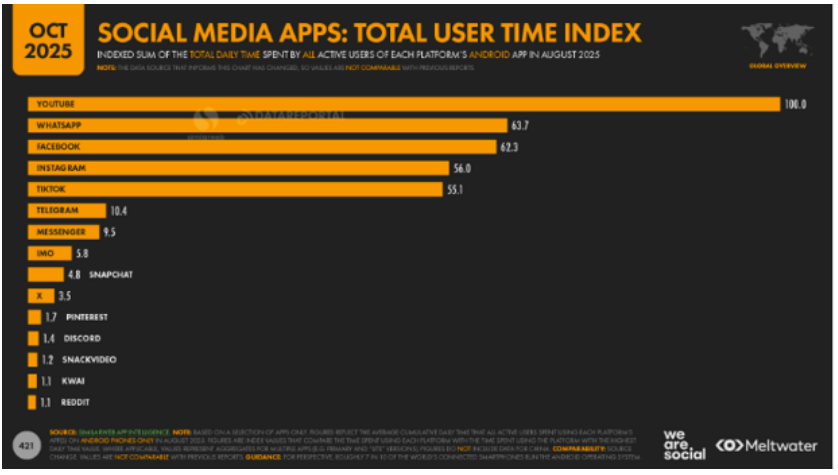


Figure 4. Time Spent on Social Media Platforms Index

The fact that the time spent on internet-mediated screens has doubled in a short period compared with the time spent on the traditional fragmented flow screen has directed attention toward broadcasting through social media. According to We Are Social 2025 data, the social media application on which the most time is spent in the world is YouTube. YouTube stands out by a clear margin in platform use, with more than 50 percent more total time than its closest competitor, WhatsApp. Having acquired the characteristic of a new-generation television broadcaster, YouTube appears as a broadcasting platform where producer and consumer meet. What distinguishes YouTube from other platforms is that its videos have a distinctive format and the ability to create a lifestyle. A single well-prepared video, especially when it ranks high in search engines and is continuously recommended, can continue to be watched, gain subscribers, and generate income for months, and sometimes even years (GMI, 2026).

YouTube uses a model in which it shares advertising revenues with content creators. In this revenue model, a structure has been created in which the content producer is also a partner. According to Global Media Insight data from May 2026, it has approximately 110 million partners. However, for many content creators, the share they receive is not enough to make a living. In this model, YouTube essentially asks its partners to provide content with which brands would want to be associated and to demonstrate that they can build and sustain a significant audience for that content. In this way, an integrated income model involving brand deals is targeted. This is because YouTube is far from being the only platform for content creators. For this reason, producers operate accounts on multiple social networks and increase their means of earning money by using platforms where they can offer content such as newsletters and podcasts (Ormen & Gregersen, 2022).

As SVOD services gain increasing importance, it is likely, as seen in historical examples, that there will be a shift toward a cost-plus-profit approach and that their long-term economic sustainability will be weakened. Therefore, content producers and policymakers need to remain alert to all possible dangers that may arise (Doyle, 2016, p. 27). Rapidly growing screen-regulation regimes also constitute a different dynamic of globalization for media scholars. It is observed that entrepreneurs who are individual content producers on platforms carry out content innovation without paying much attention to intellectual property rights (Cunningham & Craig, 2016, p. 5413). In the long term, this situation may cause YouTube to come under

the control of professional content producers and may bring limitations to personal production freedom.

Conclusion

The screen we use to watch television and the infrastructure technologies that carry content to the screen have undergone major change over the last twenty-five years. While the existing traditional structure continues on one side, developments presented as a practice of displacement on the other have turned the television ecosystem into a fragmented structure. In the OTT broadcasting model, which is the internet-mediated continuation of television broadcasting, there is a structure consisting of the triad of infrastructure, hardware, and content, just as in traditional television. In terms of hardware, screens developed in different sizes but to perform the same function — such as smartphones, tablets, laptops, and smart televisions — have diversified viewing experiences. In terms of infrastructure, the fact that broadcasting can be carried out through the internet has made it possible to access the desired content at the desired time and independently of place. This is a feature highlighted for the creation of niche audiences. However, beneath the discourse of capturing the viewer with different content in the internet-mediated broadcasting model lies algorithmic categorization, which stems from the nature of the computer. In this context, SVOD services that come to the fore categorize viewer behavior under thousands of headings thanks to big data through the discourse of niche broadcasting. Globally known SVOD broadcasters such as Netflix, whose number of subscribers has reached millions, highlight the content available in their libraries according to the interests of their customers. On the other hand, with the increase in video streaming speed, the AVOD broadcasting model has also entered the race as a different revenue and business model over the open internet. With Web 2.0, the possibility of individual content production has supported AVOD-service broadcasting, which makes different formats of content visible on platforms such as YouTube.

The emerging form of screen industries in the twenty-first century indicates that established players, norms, principles, and practices have transferred significant power and influence to social media platforms. These platforms, especially YouTube, have become highly valuable for the advertising industry, which has been a supporting element of traditional television broadcasting since the middle of the previous century. At the point reached today, television is no longer said to be "dead." This situation is not the

"death" of television but, on the contrary, its profound evolution, perhaps even its revolution. The new screen ecology, guided at its core by an interactive, viewer-centered approach, creates intertwined yet separate television worlds and economically different business models (Lotz, 2016, 2025).

Platform televisions, which have replaced traditional broadcasting carried out throughout the day by adhering to a flow, are integrated around the idea of algorithmic broadcasting. The idea of producing viewer-oriented content is also supported by transnational capital along the axis of neoliberal policies. From a technodeterminist perspective, it can be said that the future of human beings, whose history is only just beginning, will be reshaped by technology. However, humanity's attainment of this dream is possible only through socially adapting to technology.

According to Antonio Santucci, who evaluates philosophical and social problems within their historical and social contexts, praxis is the action plan of the governed, who try to avoid every kind of disappointment that may be created by the ruling class (2011, p. 155). In this period, in which action itself is the goal, YouTube is taking shape as a field of praxis. Whether the electron tube that shaped the life and culture of the individual in the twentieth century will today evolve into YouTube, enabling human beings to write their own stories, is unknown. However, technology is formatting the screen of the future. In the near future, the integration of generative artificial intelligence into television broadcasting will open new horizons in this field. This will transform all televisual broadcasting, from the creation of content to production processes, from viewer preferences to modes of transmission. In this context, it is certain that there will be a need for human intelligence that knows the codes of television broadcasting and can shape content.

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INTERACTIVE NARRATIVE ON DIGITAL STREAMING PLATFORMS: THE EVOLVING ROLE OF THE VIEWER

Damla Fatma SAYLAN[1]

Introduction

Traditional media is generally considered to have a predominantly one-way structure that offers very limited opportunities for feedback or participation when transmitting information from the producer to the consumer. With the emergence of new media, a more democratic environment has emerged in which the balance of power between producers and consumers has shifted significantly. Digital platforms that have emerged in the new media environment have offered users the opportunity to create, share, and disseminate their own content. Thus, the interactive nature of new media has enabled users to move from a passive to an active role. This transformation, as defined in Castells' analysis of the network society, has moved away from the one-way structure of traditional media toward a user-centered, feedback-driven, multi-directional network structure. Consequently, the individual has moved beyond mere consumption on the network to become a productive and transformative node within it (Castells, 2010). Parallel to this evolving structure of media driven by technological advancements, the rapid proliferation of online-based digital platforms has carried storytelling in TV series and films beyond traditional boundaries, reshaping it within a new screen environment. This has significantly impacted the relationship between the narrative and its audience. Thanks to the interactive possibilities offered by the digital age, the linear narrative structure has gained new momentum, moving the viewer from the role of a mere consumer of content to that of an active participant in the narrative process. This transformation has paved the way for the emergence of a new narrative form defined in the literature as the "Interactive Narrative Model" (Bouchardon and Ghitalla, 2003, pp. 35–46). In this context, the interactive narrative model has enabled the audience to transition from a passive role—merely following the

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story—to an active role by offering choices that allow them to make decisions, see the consequences of their choices, and thus become involved in the flow of the narrative.

This study aims to examine how interactive productions on digital platforms offer the audience a role and to what extent this new narrative form transforms the audience into a co-narrator. In this context, the study focuses on the following questions: "How do interactive digital narratives transform the audience from a passive consumer into an active co-narrator? How does the audience experience this model? To what extent is the audience free during this interaction, and what are the limits of this freedom?"

The theoretical framework of the study is based on the interactive narrative approach developed by Janet H. Murray in her work Hamlet on the Holodeck: The Future of Narrative in Cyberspace (1997). In explaining the future of digital narrative, Murray introduces the concept of cyber-drama and defines the three fundamental components that constitute this concept. This study examines the subject within the framework of the concepts of "Immersion, agency, and transformation." These three core components/concepts are used in the study both as analytical tools and as criteria for comparison. These concepts provide an analytical framework for understanding the audience's participation in the narrative at both cognitive and experiential levels.

The study's sample consists of two interactive productions released on different digital platforms: the foreign film Black Mirror: Bandersnatch (2018) available on Netflix and the Turkish series Eee Sonra? (2021) released on YouTube. These two productions were specifically selected for comparative analysis due to their production within different technical infrastructures and cultural contexts. This allows for a comparative evaluation of how interactive narrative is constructed under different conditions and what kind of agency it grants to the viewer, based on the three fundamental components/concepts presented by Murray. Additionally, given the limited production of interactive series or films in Turkey, the inclusion of a locally produced series released on YouTube enables this study to make a unique contribution to the Turkish literature.

At the time of writing, Black Mirror: Bandersnatch had been removed from the Netflix platform as of May 12, 2025, and access to the production's interactive interface had ceased (Independent, 2025). This situation points to

a structural issue regarding the permanence and re-experience ability of interactive narratives on digital platforms. However, this analysis is based on data regarding the interactive experience at the time of the production's release, as well as academic studies documenting Bandersnatch's narrative and technical architecture. From the very first day of its release, the production has been extensively examined in literature in terms of its formal structure, decision-tree system, and mechanical operation, and these studies have detailed the narrative's structural limitations. Therefore, the fact that the film can no longer be directly experienced through its interactive interface provides a methodological foundation by decoupling the analysis process from experiential viewing conditions. Consequently, Bandersnatch's status as "lost media" does not constitute a limitation for this study; rather, it is treated as an analytical data point that reveals the platform-dependent, fragile, and temporally ephemeral nature of interactive narratives. This approach clarifies the distinction between the experiential dimension of interactive media and the structural dimension of the narrative, thereby strengthening the methodological consistency of the analysis process.

The study employs descriptive content analysis method from qualitative research methodologies. Both productions are examined in line with Murray's three core components, with the viewer's decision-making spaces, the structural limits of options, points of intervention in the narrative flow, and the level of freedom experienced analyzed comparatively. This study aims to reveal how interactive narrative forms, which are becoming widespread on digital platforms, transform the viewer's experience and to discuss the extent to which the viewer is truly positioned as a "co-narrator."

Digital Streaming Platforms

The emergence of digital streaming platforms has led to a fundamental transformation in the processes ranging from content production to distribution and consumption. By making the content they produce independent of time and place, digital streaming platforms have transcended the linear structure of traditional television broadcasting. Viewers have moved beyond the passive role of a consumer bound to a specific program schedule to assume the active role of a user within a new experiential mechanism where they can personalize a customized content stream to suit their own preferences (Lotz, 2017). This transformation of the viewer does not indicate that they have attained unlimited freedom; rather, it demonstrates that they have entered a reciprocal interaction with these platforms. Beyond their promises of enabling viewers to create and share content, digital streaming platforms

position the viewer within a structure that is measurable, trackable, and steerable. In this context, the viewer transforms into a user whose behaviors—from content preferences to interaction habits—are recorded and shaped by algorithmic processes (Napoli, 2011). Srnicek defines the economic and political dimensions of this transformation as "platform capitalism." According to Srnicek, platforms have established an economic order that transforms user data into a valuable form of capital (Srnicek, 2017). Zuboff's approach to surveillance capitalism, meanwhile, emphasizes that this order carries a directive dimension. According to Zuboff, platforms do not merely monitor user behavior but actively shape it (Zuboff, 2019). Drawing on these approaches, the recommendations, decision-making spaces, and steering mechanisms that viewers encounter on digital platforms are shown to be shaped within the patterns of a capital network.

According to Tryon, digital platforms are also transforming the ways in which content is produced. This situation demonstrates that the boundaries of narrative structures are being redrawn. In this context, platforms such as Netflix, Amazon, or Disney+ assume a new type of producer role that goes beyond content production and distribution to determine the formal and technical potential of the narrative (Tryon, 2013). This infrastructure has served as one of the factors paving the way for the emergence of interactive productions where the viewer can intervene in the story. The ability to choose and intervene that digital platforms offer the viewer demonstrates that the linear flow imposed by traditional broadcasting has been broken (Bolat, 2021). For this reason, digital streaming platforms play a central role in the dimensions of consumption, production, and distribution. While high-budget interactive productions like Bandersnatch are produced exclusively on platforms with advanced infrastructure such as Netflix, the release of micro-level interactive productions like Eee Sonra? via YouTube's navigation tools proves that digital platforms possess structural differences that directly determine the level of interaction. In conclusion, digital streaming platforms create a structure where interactive narratives can flourish—one that redefines the viewer's role in the content—thanks to both their technical architecture and user-centric interfaces. Thus, these platforms establish the fundamental technological foundation required for the viewer to transition from a passive recipient to an active co-narrator.

Interactive Narrative

The interactive narrative model refers to the effects the audience creates on the narrative by being involved in the content production process. On digital

platforms, this model typically takes the form of a narrative that allows the audience to direct the flow of the story by granting them a certain degree of control through a choice-based system. Marie-Laure Ryan bases her explanation of interactive narrative on the concept of hypertext. In a hypertext structure, the text consists of various segments linked to one another through electronic connections. This structure offers the user the experience of determining their own path among the options in the database and discovering alternative directions within the narrative. Hypertext breaks the linear structure of the narrative, granting the user the ability to navigate, make choices, and transition to different possible worlds (Ryan, 2001, pp. 205–206). This multi-directional structure forms the technical and structural foundation of today's interactive narratives. The multiple paths offered by hypertext logic hold the promise of transforming the viewer's role within the narrative. According to Koenitz and colleagues, this format eliminates the distinction between the active creator and the passive viewer, initiating a new triadic relationship between the creative, dynamic narrative and the participatory viewer (Koenitz et al., 2015). Raj and Rani, on the other hand, emphasize that this format provides viewers with the opportunity to fulfill their desire to see alternative endings, a desire they often felt in traditional films. This transformation reinforces the idea that the viewer evolves from a passive recipient into a protagonist who shapes the flow of the narrative (Raj, Rani, 2024).

In this context, Janet H. Murray's approach comes into play to explain how interactive narratives, structurally grounded in Ryan's concept of hypertext, shape the viewer's experience. Murray conceptualizes the viewer's experience within this structure through the concepts of Immersion, Agency, and Transformation. Thus, while hypertext logic explains the technical functioning of the narrative, Murray's three concepts provide the theoretical framework that illustrates how the viewer is positioned within this structure.

The Changing Role of The Audience

In traditional media, the viewer occupies a position where they have no control over or influence on the content, merely "receiving" the message. However, online platforms that emerged after Web 2.0 have redefined the viewer's position by offering them the ability to produce, share, circulate, and interpret content, enabling viewers to attain the status of "User" and assume a new role. Kristen Daly has termed this phenomenon "Cinema 3.0" (Daly, 2010, pp. 81–90). Thus, in the digital age, the viewer's position has

shifted from that of a passive recipient to an active participant. This transformation has created an interactive media environment, as defined by Henry Jenkins' concept of "participatory culture," in which the viewer is incorporated into content production. Consequently, it has transformed the viewer from a passive recipient into an active participant who adds meaning, interpretation, and content to the narrative. Jenkins also links this transformation to media convergence. While the viewer's participation has evolved into an active process, the practice of this transformation can occur within boundaries set by the producer (Jenkins, 2006, pp. 1–24).

This new position of the audience is, in fact, a continuation of earlier cultural and intellectual debates. In his "read/write culture" approach, Lessig emphasizes that in digital culture, the audience is a creative subject who produces, transforms, and reorganizes content (Lessig, 2008). De Certeau, on the other hand, argues that users create their own spaces of use by developing everyday maneuvers against the system's strategies through the concept of "tactics" (De Certeau, 1984). These two approaches shed light on the cultural and historical foundations underlying the viewer's activation on digital platforms. Jenkins's theory of participatory culture, meanwhile, grounds this transformation in cultural terms. According to Jenkins, in the new media ecosystem, the audience has transformed from a passive consumer into a participatory subject (Jenkins, 2006). Digital broadcasting platforms, precisely as the spaces where this participatory culture operates, provide an environment that encourages the audience to assume a more active role in shaping content. With digitalization, the viewer has moved beyond merely consuming content and has attained a position where they shape content by utilizing technical capabilities. Consequently, digitalization offers the viewer a new viewing experience that goes beyond the traditional norms they are accustomed to. This technical transformation has facilitated the evolution of the relationship between the viewer and the narrative into an interactive structure (Bolat, 2020).

One of the areas where this shift in the audience's role is most evident is in digital platform series and films. With the emergence of the interactive narrative model, viewers are now able to go beyond merely consuming series or films and actively participate in the flow of the narrative. Interactive narrative forms provide viewers with a decision-making mechanism that allows them to determine the direction of the story, thereby granting them a form of "agency" within the narrative world, as defined by Murray. This innovation is transforming viewers' traditional viewing practices. In this context,

the digital age has transformed the viewer's role into that of an active agent who directs the story, experiences alternative paths, and observes the consequences of their own choices.

This rapid development of digital technology is also shaping the way viewers experience audiovisual narratives. Technologies such as Virtual Reality (VR) and Augmented Reality (AR) have not only diversified the technical production processes of narratives but have also transformed the viewer's relationship with the narrative into an interaction-based structure (Livingstone, 2003, pp. 27–29). According to Steuer, VR technology creates a "sense of presence" (telepresence) for the user. Even if the viewer is not physically present, they experience a sensory and cognitive integration within the digital space (Steuer, 1992, pp. 73–93). Consequently, new media technologies move the viewer away from a one-way communication model and place them in a more active and participatory position.

The interactive narrative model is one of the most visible examples of this transformation. Interactive narratives allow the audience to steer the flow of the story to a certain extent through their choices. By introducing a choice-driven narrative form that guides the audience through various possible worlds, this model transforms the audience from a passive consumer of content into an active participant in the construction of the narrative's meaning. However, this interaction is not unlimited. Aarseth refers to this situation as "ergon text" and defines it as follows: "Throughout the cyber-textual process, the user effectively performs a semiotic sequence, and this selective action constitutes a physical act of construction that various concepts of 'reading' cannot explain. I call this phenomenon, derived from the Greek words *'ergon'* (meaning 'work') and *'hodos'* (meaning 'path'), which I borrow from physics, 'ergodic.'" According to Aarseth, in ergodic texts, a certain effort (nontrivial effort) is expected from the user, but the scope of movement granted to the user is limited by paths predetermined by the narrative's architecture. Consequently, even though the viewer may believe they are making choices, these choices actually take place within a closed space of possibilities created by the designer. For this reason, while interactive narratives appear to offer freedom, structurally they keep the user under control through specific directives and algorithms (Aarseth, 1997). Similarly, Manovich notes that user action in digital narratives occurs within a world of programmed options. Thus, even if the viewer becomes active, the experience ultimately takes shape within the framework defined by the creative team (Manovich, 2001, pp. 225–228).

The literature on the interactive narrative model discusses from various angles that the scope of participation granted to the viewer is not as unlimited as it appears. These perspectives demonstrate that the freedom offered by interactive narratives is not absolute but rather a freedom structured by design. In this study, to assess how these structural limitations affect the viewer's experience, three fundamental concepts proposed by Janet H. Murray to explain interactive narrative—, immersion, agency, and transformation— —are employed as analytical tools. Murray's concepts provide a consistent theoretical framework for evaluating both how the audience is engaged with the digital narrative and at which points this engagement is strengthened or limited. Therefore, the analysis section of this study reexamines the interactive narrative model discussed in the literature—and the limits of freedom it offers—through Murray's triadic model, using concrete examples.

Janet H. Murray's Approach To Interactive Narrative

In her work Hamlet on the Holodeck: The Future of Narrative in Cyberspace (1997), Janet H. Murray introduces three fundamental concepts that define the relationship between the user and the digital narrative universe: immersion, agency, and transformation. Murray's concepts are not merely a technical classification. They also constitute an intellectual framework that describes the new realms opened up in the viewer's experience by the storytelling forms of the digital age. Therefore, each concept not only explains the functioning of the digital world but also opens an intuitive horizon regarding how narrative transforms the viewer, thereby imparting both analytical and poetic meaning. For this reason, the theoretical and analytical framework of this study is grounded in these three concepts.

Immersion

Immersion refers to the audience's sense of presence within the narrative, that is, their emotional, cognitive, and sensory immersion in the narrative world. According to Murray, one of the greatest strengths of digital narratives lies in their ability to offer the audience the experience of being there. In other words, immersion represents a kind of voluntary surrender by the reader or viewer into the world presented by the narrative. This experience resembles a silent journey into the depths of the fictional world, temporarily suspending the weight of the real world. In digital narratives, immersion is both a sensory and cognitive state of being drawn in, as the user does not merely look or listen but experiences the sensation of being there through

intense sensory perception. What makes this immersion possible is the consistency of the fictional world created by the narrative. It lies in the characters' motivations, the continuity of settings, the organic flow of the plot, and the fact that all of these remain meaningful despite interventions from the user. When this immersive effect combines with the power of simulation, the viewer can temporarily lose awareness of their physical surroundings and become part of the narrative's fictional reality. However, immersion is also fragile; as Murray emphasizes, a faulty selection screen, a delayed response, or an inconsistent event can momentarily collapse the narrative world. Thus, immersion functions not merely as a well-crafted aesthetic atmosphere but as a silent agreement between the user and the narrative. The effectiveness of the concept of immersion in interactive works is closely tied to the extent to which user choices support this cohesion. As long as immersion remains effective, the narrative transforms the viewer from a passive consumer into a living presence within its own world (Murray, 1997, pp. 98–119). Marie-Laure Ryan, who elaborates on Murray's definition of immersion, examines this experience across three dimensions. Spatial immersion refers to the viewer's physical sense of being within that world. Emotional immersion expresses the empathy formed with the characters' fates. Cognitive immersion, meanwhile, is the mental engagement involved in unraveling the narrative's mysteries (Ryan, 2001).

Agency

Murray defines the concept of "agency" as follows: "Agency is the satisfying power that enables us to take meaningful steps and see the consequences of the decisions and choices we make." Murray views agency as one of the most satisfying aspects of digital narratives because the user does not merely follow the story but also assumes the role of an actor who shapes the narrative flow. It is precisely in this context that agency emerges when interactive narratives offer the user the opportunity to touch the pulse of the story. Whether a choice alters a character's fate, transforms the setting, or reshapes the narrative's direction in a different way is the fundamental criterion for determining whether the viewer has truly become a co-narrator. However, agency certainly does not imply unlimited freedom. According to Murray, a digital narrative gains meaning not only through the paths it opens for the user but also through the paths it closes. Choices are designed not to exceed the narrative's internal logic, and the user can act only to the extent permitted by the fictional world's possibilities. Thus, agency exists on the

fine line between freedom and guidance. The success of an interactive production lies in how consciously this line can be established (Murray, 1997, pp. 123–143).

Transformation

Transformation, Murray's third component, is the broadest concept encompassing both the dramatic and experiential dimensions of interactive narrative. Drawing from Murray's account, it is possible to say that Transformation manifests at two levels: narrative-internal transformation and the transformation experienced by the user. Users' choices alter the plot, the characters' journeys, and the state of the narrative world. In other words, as Murray emphasizes, the user moves from the position of an outsider observing the story to that of a potential agent capable of transforming the narrative from within. This transformation process represents the in-narrative transformation within interactive environments. However, according to Murray, interactive narrative transforms not only the story but also the user. Through the choices they make, users assume different roles and encounter alternative selves, thereby developing new self-awareness through the decisions they make within the narrative. This situation also reflects the transformation experienced by the user. Transformation is the most poetic dimension of interactive narrative because as the story changes, so does the audience. In Murray's vision of cyberdrama, transformation becomes the narrative's ultimate function. *The narrative does not merely present a world; it also transforms the user, who, through the agency, becomes immersed in that world as it is being constructed (Murray, 1997, pp. 148–168)*.

These three fundamental concepts—immersion, agency, and transformation—presented by Murray provide a comprehensive framework for understanding both the structural and experiential dimensions of interactive narrative. This study aims to analyze the experience offered by interactive digital productions to the audience not only through technical features but also through the nature of the user-narrative relationship. Therefore, in the analysis section of this study, the examples of Black Mirror: Bandersnatch (2018) and Eee Sonra? (2021) were examined in line with Murray's conceptual framework, and a comparative evaluation was conducted to assess the extent to which the audience is immersed in each production, the type of agency they possess, and how this agency creates transformation in both the narrative and the user. Thus, through concrete examples, the study illustrates the mechanisms by which interactive narratives—now widespread on

digital platforms—position the viewer as a co-narrator and define the boundaries of freedom.

Findings and Analysis

In this section, drawing on Janet Murray's theory of interactive narrative, the productions *Black Mirror:* Bandersnatch and Eee Sonra? are analyzed comparatively through the concepts of agency, immersion, and transformation. Both productions are examined in light of the technical capabilities and narrative choices of their respective platforms, with an evaluation of the viewer's agency and level of participation within these interactive digital narrative universes.

Black Mirror: Bandersnatch (2018)

Bandersnatch (Netflix, 2018) is an interactive film that allows viewers to shape the narrative through their choices. It explores the psychological breakdown experienced by a young developer within the 1980s video game industry during the creative process. Through meta-narrative layers that question free will, determinism, and the relationship between media and technology, the production positions the viewer as both an observer and an actor. In this way, it transforms the boundaries of the narrative, the nature of control, and the act of decision-making into a cinematic laboratory.

Immersion

Set in the atmosphere of the 1980s, Bandersnatch constructs a world that distinctly draws the viewer in through the story of Stefan Butler, a young game developer. The immersion phase—which Murray defines as emotional and sensory immersion—is built within the film through the period's atmosphere and the planes where the boundaries of the narrative universe are broken. Period Atmosphere: This includes elements such as vintage computers (ZX Spectrum-style), cassette-based game loading systems, Synthwave music, and television commercials from the era. These elements take the viewer on an atmospheric journey that incorporates them into the story and narrative universe on both a sensory and physical level. In-game software within the film, scenes where the boundaries between reality and the game dissolve, and moments when the character realizes they are being controlled, enhance the level of immersion. Example scene: When Stefan suddenly says, "Someone is controlling me," during therapy, the viewer realizes that the choices they made are being felt by the character. This scene concretely embodies the viewer's experience that Murray emphasizes through immersion.

Furthermore, the narrative's meta-level awareness of the viewers such as scenes where the character senses the viewer's presence and questions it—paradoxically deepens immersion rather than breaking it. Because these scenes suggest that the viewer is not merely an outside observer, but an actor embedded within the narrative's ontology, thereby intensifying immersion on both psychological and narrative levels. On the other hand, in a study analyzing the production through the lens of the viewer's role, it has been argued that such meta-scenes risk undermining immersion by creating inconsistencies in expectations due to the viewer's habit of receiving immediate feedback from social media (Lopera-Mármol et al., 2023).

It is possible to explore these discussions further through the three-dimensional immersion characteristics defined by Marie-Laure Ryan (2001). The film achieves spatial immersion by drawing the viewer into the atmosphere of the 1980s through high production quality, yet this flow is interrupted whenever interactive choice screens appear. Consequently, the viewer is constantly pulled out of the narrative world and forced to make a decision, which weakens the sense of being spatially immersed in that universe. In contrast, production strengthens the dimension of emotional immersion through the tense relationship established with Stefan. Since the viewer takes on not only Stefan's daily choices but also the traumatic decisions that affect his mental health and fate, they are able to form a deep empathy with the character. Cognitive immersion, however, is the most dominant dimension in Bandersnatch. The viewer engages in a mental effort to explore all the narrative's possibilities, uncover hidden endings, and decipher how the system works. Therefore, from Ryan's perspective, Bandersnatch presents immersion not as a physical, full-scale inclusion of the viewer into the narrative universe, but rather as a mental and emotional depth of immersion focused on unraveling the narrative's labyrinthine structure.

Agency

According to Murray, agency is the power to make meaningful choices and derive satisfaction from seeing the consequences of those choices. In a study analyzing Bandersnatch within the context of free will, the limits and alternative forms of this power in Bandersnatch and similar constrained productions are examined, and this type of agency is categorized beyond the viewer's free will into "Obscured Agency," Involuntary Agency, and Replayability (Rezk, Haahr, 2022). These concepts add significant analytical depth

to Murray's definition of Agency, helping to understand the effects Bandersnatch creates in the viewer and the film's efforts to maintain the illusion of freedom.

"Invisible Agency" refers to situations in which the relationship between the viewer's choices and the outcome of the plot is deliberately rendered incomprehensible. For example, the choice Stefan makes in the scene where he asks who is controlling him appears to be the pinnacle of agency, where the viewer consciously intervenes in the film. However, this meta-scene is actually a pre-programmed sequence of options designed to test the extent to which the viewer believes in this illusion of free will. Regardless of which option the viewer chooses, this action still takes place within a limitation designed by the system itself. Therefore, Invisible Agency demonstrates that even now when the viewer is led to believe they have been granted the highest level of control, the true impact and consequences of the action are intentionally obscured by the platform's hidden structural architecture.

Unintended Agency, on the other hand, refers to structural loops that force the viewer into unintended or harmful outcomes for the character. An example of this in Bandersnatch is how Netflix's interactive engine, through its control mechanism, returns the viewer to the same point after making a choice. How these forced returns impact the user experience was examined in 2019. In the study, nine participants reported losing interest during moments in Bandersnatch where the narrative looped back to previously viewed scenes, demonstrating that the coercive return mechanism reduces Agency satisfaction. In the same study, participants' perception of the overall narrative impact (Global Effectance) was found to be relatively high; however, due to the limited number of choices, the sense of autonomy remained nearly neutral (M=3.2). (Roth & Koenitz, 2019). This finding reveals that, despite the viewer believing they can influence the narrative, the limited number of choices reduces the sense of autonomy and demonstrates how the pleasure agency could create for the viewer is hindered.

Replayability, on the other hand, examines the relationship between the replay value of interactive productions and agency. Bandersnatch is built on a structure of high replayability by its narrative nature, which compels the viewer to watch repeatedly to see different endings and overcome mandatory loops. This act of repetition demonstrates that the viewer is subject to the designer's rules rather than providing the pleasure of agency. The removal

of the production from the Netflix platform has eliminated the critical re-watchability mechanism. The viewer's agency over the narrative is constrained not only by structural limitations but also by the institutional decisions of the platforms. Consequently, the inaccessibility of Bandersnatch reveals that the agency experience in interactive narratives is not absolute; it is contingent on the existence of the platform, temporary, and fragile.

A structural analysis of the choice mechanisms in the film Bandersnatch reveals that the effects of the agency it grants the viewer are divided into micro and macro levels. The production's fundamental architecture structures the viewer's control across two distinct scales—quantitative and qualitative.

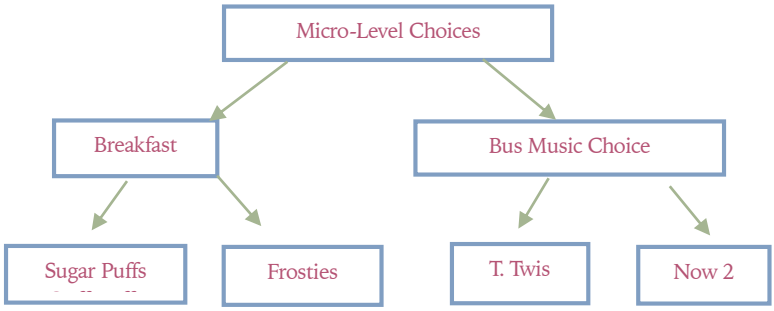


Figure 1: Examples of choices in Bandersnatch that generate scene variations at the micro level

1- Micro-level Choices: These are choices that support the concept of small-scale, invisible agency occurring at the scene level. These choices generate short scene variations within the narrative but do not directly influence the overall flow of the narrative in a significant way.

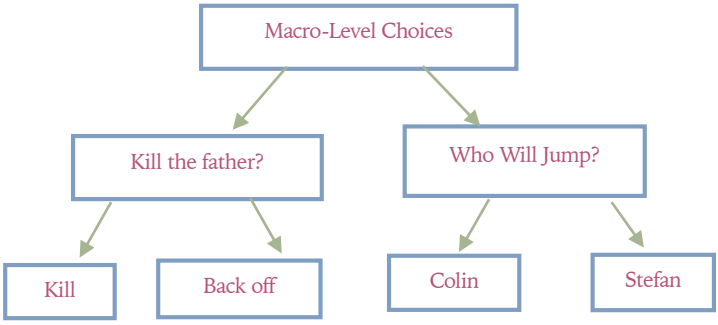


Figure 2: *Examples of macro-level choices that determine the direction of the story in Bandersnatch*

2- Macro-level choices: These are key choices that significantly alter the narrative flow, leading the viewer to alternative scenes, multiple endings, or mandatory looping sequences. For example, the choice "Should Stefan kill his father?" constitutes one of the film's most critical decision-making mechanisms. If the viewer selects "yes," Stefan attempts to hide the body. If

they select "no," the psychological breakdown continues, leading to different therapy-flashback scenes.

Depending on the sequence of choices the viewer makes from the very beginning of the narrative, they arrive at one of several possible endings. In Bandersnatch, there are dozens of variations on the five main endings, but the way each viewer reaches that ending varies. Thus, the viewer can feel that they are not merely making choices but playing an active role in determining the outcome of the narrative. However, the film constantly returns to a predefined structure. In his study analyzing Bandersnatch in terms of form and content, Yurtseven states that Bandersnatch constructs its branching structure using the Gauntlet model, one of the non-linear narrative methods. However, this model offers a simpler flow compared to other complex branching narrative structures. In the Gauntlet structure, outcomes such as death or dead ends when moving from one step to another allow for backtracking within the story. This model, which appears relatively linear, also frequently redirects the viewer back to a specific point in Bandersnatch through dead ends. With this structure, Bandersnatch offers the viewer an experience with multiple possible endings, yet at its core, it remains quite close to a linear narrative (Yurtseven, 2023, pp. 122–123).

Tepe and Ovalı's decision tree and flowchart-based analysis of Bandersnatch reveals that the interaction offered to the viewer does not create a space of unlimited freedom; rather, it presents a controlled structure that progresses through predefined narrative nodes and mandatory redirects. This structure makes the viewer's choices visible but keeps the interactive aspect of the narrative fixed within the platform and narrative design. Consequently, in interactive digital narratives, the viewer experiences a form of engagement that allows them to move within predetermined probability spaces (Tepe and Ovalı 2021). All these findings demonstrate that Bandersnatch and similar interactive digital narratives transform the viewer into a decision-maker who progresses through a choice mechanism, while revealing that the viewer cannot fully participate in the narrative's flow as a co-narrator.

Transformation

The transformation Murray refers to through his concept of "Transformation" takes place within a two-dimensional structure that encompasses both the transformation of the narrative and the transformation of the viewer experiencing this transformation. In the transformation of the narra-

tive, the viewer can significantly alter the characters' relationships, their psychological development, and the direction of the plot based on their choices. The viewer's ability to reshape the narrative's flow, as Murray emphasizes, transforms the viewer themselves. In this context, one of Bandersnatch's strongest aspects is that it prompts the viewer to begin questioning not only the story but also their own intentions. For example, Stefan's statement, "You're controlling me," shakes the viewer's ethical stance, drawing them into the free will versus determinism dilemma. In a sense, as the viewer makes choices, they confront the ethical consequences of those choices. In this vein, the film can indirectly confront the viewer with questions such as: Why did I choose this path? Is the control in the character or in me? Why did this choice bother me? These inquiries reflect the transformative relationship Murray describes as occurring within the viewer when explaining his concept of "transformation." According to this relationship, the viewer not only makes choices but also experiences the reverberations of events arising from those choices on their own person. However, it is debatable whether the transformative experience the viewer undergoes truly offers a space of freedom. In her analysis of Bandersnatch, Nada Elnahla argues that this surface of interaction granted to the viewer is woven with a deeper logic of guidance and surveillance. According to Elnahla, while interactive productions offer the viewer a high degree of control, they actually integrate the viewer into a new network of data mining that expands the platform's capacity for surveillance and algorithmic guidance. She interprets this as the platform transforming the excessive control it grants the viewer into even greater manipulation. From this perspective, Bandersnatch presents the seemingly limitless realm of choice to the viewer as a controlled freedom framed by the platform's design strategies, thereby positioning the interaction in a hybrid space between creative agency and systemic steering. When Murray's concept of "transformation" is read alongside Elnahla's critique, it more clearly reveals that the transformation experienced by the viewer is not merely an in-narrative experience but also encompasses a relationship of guidance shaped by the platform's invisible strategies.

Eee Sonra? (YouTube, 2021)

Eee Sonra is a local interactive mini-series released on YouTube, where the viewer progresses by making decisions at specific points. Although production has a low budget and a more everyday narrative universe, it constitutes a local example of the interactive narrative model through the way it opens up its choice points and character relationships to viewer participation. The

series presents a narrative flow centered on the relational tensions between two characters—primarily based on romantic and everyday life themes—in an interactive format. Consequently, the interaction operates at a micro-level, influencing emotional and social outcomes rather than through large-scale direction.

Immersion

The series Eee Sonra? uses the dramatic elements of everyday life to create an atmosphere that draws the viewer in. The experience of immersion, which Murray (1997) describes as a voluntary surrender—is achieved in this series primarily through familiar settings, realistic relationships, natural dialogue, and the camera's close positioning relative to the characters. The frequent use of close-ups in the series brings the viewer closer to the characters' emotional states, facilitating identification. For example, in the couple's argument scenes, close-ups are frequently used, and the emotional tension between them reaches its peak before the selection screen appears. Thus, the viewer's decision-making process becomes integrated with the scene's dramatic atmosphere. The series' low-budget production, its narrative universe that offers slices of everyday life, and the fact that it presents the viewer with only two options toward the end of the episode achieves a small-scale immersion that creates the experience of being cognitively and emotionally present within Murray's narrative world. For this reason, Eee Sonra? establishes a dramatic, illusionary immersion supported by choice-based interaction rather than the powerful immersion described by Murray. Consequently, the viewer cannot fully experience the sensation of being immersed in a narrative world on both physical and cognitive levels.

Agency

"Eee Sonra?" includes various decision points where the viewer can make choices; however, the consequences of these choices manifest not as branching of the plot at the macro level, but rather as micro-level interactions that shape the emotional tone of relationships and character behavior. This demonstrates that Murray's concept of agency has a more limited yet functional counterpart within the context of local production. The YouTube platform does not offer an interface suitable for interactive storytelling. However, the production utilizes YouTube's card-based navigation feature at the end of the video, thereby transforming the content into an interactive experience. The selection mechanisms are presented to the viewer only at the end of each episode. The typical types of choices in the production primarily have an effect on altering the emotional tone of the scene. They influence

the characters' attitudes toward one another and, in some instances, lead to different mini-scenes. However, the narrative's core flow generally proceeds in the same direction, and a multi-branching structure is not observed. Consequently, the Agency phase in this series progresses only at a micro-level. The viewer does not have full control over the narrative, but since choices still possess the ability to shape an emotional and relational flow, they are suitable for creating meaningful actions. Nevertheless, since they do not offer control on a large enough scale to alter the story's fate, narrative branching does not occur. The viewer's agency is limited, and the overall atmosphere of the narrative world remains largely static. Consequently, *"Eee Sonra?"* offers its audience a limited yet discernible degree of agency. This interaction can be evaluated as a form of smaller-scale agency that aligns with the series' structure, which is rooted in romantic and personal relationships. In this context, the production differs from the coercive institutional constraint strategies observed in Bandersnatch and analyzed by Rezk and Haahr (2022). The production does not force the viewer to encounter mechanisms like "Unwanted Action," which forcibly redirect the narrative's core flow; instead, it transparently reflects the emotional tone of the choices. However, "Invisible Agency" applies to both productions. All presented options are limited to a pre-designed text through the platform's technical architecture, just as in Bandersnatch and other interactive productions. Thus, the inherent restriction of agency is a structural reality for *Eee Sonra?* as well. The fact that the production's technical architecture is limited to YouTube's simpler and more linear navigation tools, and its focus on a simple relational tension—as opposed to the complex theme of free will illusion found in Bandersnatch—shapes the scope of the agency level. For this reason, Eee Sonra? is able to present the agency level through micro-level participation, due to its content being constrained by technical limitations and narrative choices.

Decision Categories	Relational Preferences	Action Options
Continue – Abandon options	Options to maintain or end a relationship or situation	Options to avoid or confront a situation
Start a fight/Avoid a fight	It won't work with us / Even if you say it will, it won't	Mention your ex / Say you're serious

Decision Categories	Relational Preferences	Action Options
Let them get drunk / Don't let them get drunk	Follow the book/Don't follow the book	Let them go into the forest/Let them keep driving

Table 1: *Typical Types of choices in production*

Transformation

The "Eee Sonra?" series presents both dimensions of the two-dimensional transformation discussed by Murray's concept of transformation at a limited level. The narrative transformation in "Eee Sonra?" creates limited effects such as viewer choices, characters drifting apart or growing closer, and arguments escalating or subsiding. Since this transformation affects the characters' psychological states, viewer choices create only small-scale but realistic paths of transformation. The viewer's experiential transformation, meanwhile, occurs through experiencing reflections of their own emotional life via the characters' stories. The decision-making mechanisms presented to the viewer are structured to offer natural flows drawn from everyday life. The viewer directly witnesses the emotional consequences of every decision they make. Consequently, the act of watching and choosing holds the potential to evolve into a process of self-reflection.

Unlike high-budget examples of interactive storytelling, "Eee Sonra?" constructs its interactive framework through the natural flow of everyday life. In this context, Murray's three core concepts find their place in this series by establishing immersion through emotional closeness, agency through relational dynamics at a micro-level, and transformation through limited changes occurring in both the character's and the viewer's experiences. Consequently, despite its technical limitations, this production can be regarded as a local example that strengthens the emotional dimension of interactive storytelling.

Comparative Analysis

In this section of the study, the two interactive productions, Bandersnatch and Eee Sonra?, are examined through the three core concepts proposed by Janet H. Murray. Since both productions generate the viewer's participation in the narrative universe within different technical and cultural contexts, the comparative analysis reveals various variations of the interactive narrative model. The concepts addressed within the analytical framework, meanwhile, offer the opportunity to explain this difference on a theoretical level.

Immersion

Bandersnatch is a high-budget production within the Netflix ecosystem. Consequently, it delivers a powerful immersion experience through its period atmosphere and cinematic universe. The viewer is immersed in a narrative universe surrounded by multiple alternative universes, a fractured timeline, a nostalgic period atmosphere, and intertextuality. Eee Sonra?, on the other hand, is a lower-budget production compared to Bandersnatch, so it establishes immersion not so much through technical means but by framing the characters and the plot within the natural context of everyday life. The element that draws the viewer into this production is the atmosphere it creates—one that aligns with the flow of daily life—thanks to the natural dialogue and the realism of the characters.

Bandersnatch's period atmosphere immerses the viewer in the narrative universe by transporting them to a nostalgic, clearly defined sense of time and place. The sequence in which Stefan becomes mentally overwhelmed is another moment where the viewer feels fully immersed in the narrative universe. For example, when Stefan says, "Someone is controlling me," during therapy, it makes the participatory experience—where the viewer's choices are reflected in the narrative—visibly apparent. In summary, Bandersnatch's hypertext structure, which creates a "game within a game," along with formal elements such as coding errors and a fractured timeline, enhances the immersion experience by positioning the viewer across multiple layers within the narrative. In the production titled Eee Sonra?, realistic settings and everyday dialogue take center stage. The narrative world flows naturally and simply. Consequently, in this production, the viewer can experience simple and emotional immersion, feeling as though they are witnessing a slice of life. The most important elements that draw the viewer into the narrative are emotional curiosity and relationship dynamics. In Bandersnatch, the choice mechanisms interrupt the immersion because they appear within the narrative flow; however, in Eee Sonra?, since the choice mechanisms are presented to the viewer only at the end of each episode, such an interruption does not occur. As a result, both productions draw the viewer into the narrative within their own technical production conditions. This demonstrates that the immersion experience can take different forms—qualitatively —depending on budget, formal aesthetics, and cultural context.

Agency

Both productions place the viewer in a co-narrator position, yet they fundamentally diverge due to the level, type, scope, and restrictive mechanisms of

the agency they offer. This divergence is largely dependent on the productions' platforms, technical architecture, and narrative objectives. Bandersnatch offers the viewer a wide range of choices at both the macro and micro levels. While micro-choices only create differences at the scene level, macro-choices lead to alternative universes, new endings, or recurring loops. In the narrative universe created by Bandersnatch, the viewer's agency influences the narrative outcome at both the micro and macro levels. Eee Sonra?, however, offers a more limited level of agency. The viewer's choices affect the characters' emotional reactions, the course of their relationships, and only the episode's ending. While watching the episode, the viewer cannot make any choices at the beginning, middle, or any other point; they can only partially shape their own ending by selecting one of the two options presented at the end of the episode. Consequently, since the power of agency operates quite limitedly at the micro-level, the viewer remains largely tied to a single main plotline. They do not encounter a multi-branching structure or alternative universes like those in Bandersnatch. Both productions place the user in a decision-making position, but the level of agency they offer differs in terms of experience and impact. This aligns with the views of Roth and Koenitz (2019), who argue that control in interactive narratives is often an illusion because the viewer's agency operates within boundaries predetermined by the designer.

As Yurtseven (2023) notes, the fact that Bandersnatch's branching structure is based on the Gauntlet model compels the viewer to make repeated choices to advance the story and reach different endings, and to retrace their steps when a path leads to failure. This situation reduces the "meaningful choice" defined by Murray while highlighting the "Unwanted Agency" emphasized in critical analyses. In contrast, Eee Sonra?'s branching structure does not utilize the Gauntlet model's coercive return mechanism. Due to YouTube's technical limitations (cards/screen transitions), "Eee Sonra?" features a simpler, discrete branching structure— —that leads to a specific outcome. Bandersnatch, however, requires repeatability to function with this mechanism. Since Eee Sonra?'s narrative flow does not necessitate such a requirement, it remains dependent on the viewer's choice. It is precisely at this point that Bandersnatch's status as "lost media" creates a critical paradox. Since Bandersnatch's interactive interface (control panel) is an integral part of the narrative flow and logic, the removal of this interface completely invalidates the experience. Even if the viewer could watch Bandersnatch without the interactive interface, they would struggle to grasp the work's holistic

narrative potential, seeing only a variation randomly selected by the system. In Eee Sonra?, however, even if the viewer watches the series without the simple interface based on limited choices, they will not experience a significant disruption in the narrative flow thanks to its limited and discrete branching structure. This demonstrates that Bandersnatch's "lost media" status has a far more destructive effect on narrative integrity compared to Eee Sonra?.

Transformation

Bandersnatch creates a high capacity for transformation by offering different variations, multiple endings, loop structures, and alternative personality shifts based on user choices. The narrative is structured to be reshaped by the viewer's every action. For example, depending on the viewer's choices: Stefan's character, his actions, his relationships with other characters, and even his physical location can change. Eee Sonra?, on the other hand, establishes this transformation at the level of scenes and character relationships. The endings of episodes do not change radically. Viewer choices can only alter the direction of the relationship, the dramatic impact of scenes, and the reactions characters give to one another. When comparing the transformation of the viewer's experience, Bandersnatch confronts the viewer with questions about ethical decisions, determinism, free will, and the illusion of control, thereby enabling the viewer to undergo an internal transformation. Eee Sonra?, on the other hand, immerses the viewer in a more every day, relationship-based transformation. Without altering the story's central axis, the viewer finds themselves in a position akin to their daily life choices within the framework of an emotional transformation, experiencing this transformation only at the level of internalization.

Janet H. Murray's Concept	Bandersnatch (2018)	Eee Sonra? (2021)
Immersion	Strong	Limited
Agency	Strong	Limited
Transformation	Strong	Limited

Table 2: A Comparison of the Productions "Bandersnatch" and "Eee Sonra?" in Light of Murray's Concepts

Evaluation Based On The Relationship With Interface Design

Another critical factor determining the scope of action available to the viewer in interactive digital narratives is the design of the interface through which the narrative unfolds. The interface serves as a layer that directly guides the cognitive, sensory, and decision-making relationship the viewer

establishes with the narrative. The three concepts proposed by Murray function as a technical space where viewer experiences materialize through this layer. Therefore, the interface is not merely a medium for conveying the narrative; it is also one of the elements that determines the intensity of the viewer's engagement with the narrative. Bandersnatch's interactive interface was designed using the capabilities of Netflix's interactive narrative engine and guides the viewer through decision points via dual-option cards that appear on the screen. The interface of Eee Sonra? is based on YouTube's card navigation feature and operates through alternative video links presented to the viewer at the end of each episode. This demonstrates that digital platforms are transforming content production methods and redefining the boundaries of narrative structures. Consequently, the interface choices of these two productions create an experiential difference. While Bandersnatch invites the viewer into the story, "Eee Sonra?" opens up a space for the viewer to guide the story from the outside. This difference affects the levels of agency, immersion, and transformation experienced by the viewer. Therefore, comparing the examples of Bandersnatch and Eee Sonra? serves not only to evaluate two different interactive productions but also to understand how two distinct narrative architectures produce different action experiences in the viewer. Murray's (1997) concepts of immersion, agency, and transformation serve as a compass for understanding the interface's function precisely at this point. Immersion reveals the interface's power to immerse the viewer in the narrative universe, agency highlights the scope of action the interface offers, and transformation uncovers the interface's transformative effect on both the viewer and the narrative.

In conclusion, both productions involve the viewer in the narrative universe's flow, transforming them from a passive consumer into an active participant. However, they demonstrate that interactive narratives can take different forms depending on the cultural and technological context. Based on the analyses, while Bandersnatch places the interactive structure at the center of the narrative, making it the story's central element, Eee Sonra? uses the interactive structure as a tool to support the dramatic experience. In other words, the interactive structure serves merely as a supplementary element to the narrative. Drawing on Murray's approach, both productions demonstrate how the interactive narrative model can take shape in different cultural and technical environments.

Conclusion

The rapid rise of digital platforms has transformed storytelling both formally and in terms of content and has also transformed the audience's relationship with the narrative to a certain extent. This study examined the extent to which the audience has shifted from a passive consumer to an active participant through the interactive narrative model, which offers a clear example of this transformation. Therefore, in line with the study's objective, the productions Black Mirror: Bandersnatch and Eee Sonra?, created under different technical and cultural conditions, were evaluated comparatively within the framework of Murray's concepts of immersion, agency, and transformation. The findings indicate that despite applying interactive narrative under different aesthetic, technical, and cultural conditions, both productions offer a common framework that redefines the viewer's position.

It has been observed that Murray's three core concepts emerge to varying degrees in both works, depending on their unique atmospheres. While Bandersnatch facilitates viewers' participation in the narrative universe on a macro level thanks to its high-budget production capabilities and advanced interactive infrastructure, Eee Sonra? maintains this participation on a more micro level. In Bandersnatch, viewer choices generate multiple endings that reveal different variations of the plot. Eee Sonra?, on the other hand, creates partial changes at the scene level without significantly altering the singularity of the narrative's plot. In Eee Sonra?, the viewer has the right to make a choice only at the end of each episode, and this choice does not affect the narrative flow of the next episode; it merely allows the viewer to select the desired ending at the conclusion of the episode where the choice is offered. In light of these two key differences, it has been observed that each of the concepts discussed by Murray has acquired a more pronounced functionality in the Bandersnatch universe compared to the narrative universe of "Eee Sonra?" In light of these findings, it is evident that the interactive narrative model of cannot be reduced to a single structural form; rather, it can be shaped by the cultural, economic, and technological conditions of its production environment, dividing into various layers, and the experiential impact each model creates on the viewer can vary.

This study also highlights that viewer freedom does not operate as unlimited liberty but rather as a partial freedom framed by the rules of the interactive system. In both works, the viewer intervenes in the story through choices that direct the narrative flow; however, this transforms the viewer from a mere consumer into a decision-maker capable of determining the narrative's

rhythm within the systemic framework presented to them. Bandersnatch's mandatory loops and Eee Sonra?'s open-ended option structure clearly demonstrate that choices are determined within a systematic boundary. Consequently, the viewer's co-participatory role does not imply absolute creative control over the narrative; it is limited to the capacity to engage in meaningful actions within the paths defined by the system. This limited participatory role that interactive narrative offers the viewer can give rise to new ethical questions and psychological debates regarding the viewer's experience. In particular, Bandersnatch's themes of free will, loss of control, and multiple realities not only grant the viewer the power to steer the story but also force them to confront the possibility of being steered by the story itself.

Bandersnatch's transition to "lost media" status as of May 12, 2025, simultaneously highlights the fundamental limitations that define both the accessibility of interactive narratives and viewer-user agency. Although the production remains accessible on various websites in versions that vary in length, the interactive narrative model cannot be experienced due to the lack of Netflix's original interface. This situation demonstrates that the viewer's position of freedom within interactive narratives is determined not only by the choices available but also by the platform interface designs that make these choices possible. Consequently, the removal of Bandersnatch brings to light the tension between viewer agency and the design infrastructure limitations of digital platforms, thereby raising current questions regarding the sustainability, achievability, and future preservation of interactive narratives.

The interactive narrative model is a hybrid transformation process that combines technological advancements of the digital age with technical, cultural, and aesthetic elements. This study demonstrates that, within this transformation process, the audience is evolving toward an increasingly active role on digital platforms; however, this activity is redefined within the design boundaries of each production. The technical and institutional limitations of each platform, which render uncertain how long the audience can access interactive productions, is another factor highlighting the limitations of audience-user freedom. In the near future, interactive narratives are expected to evolve into a more fluid and personalized structure through AI-supported dynamic scene generation capable of producing instant responses to the viewer's choices. However, the fragile nature of digital content—which can migrate from one platform to another or be removed from access—is already relegating some interactive productions to the status of lost media. Given

this situation, it becomes clear that interactive productions must be considered not only in terms of technological advancements but also in terms of digital archiving, accessibility, and sustainability policies. Therefore, it is anticipated that the future of interactive narratives will continue to take shape within this tension between the viewer's growing agency and the structural fragility of the digital environment.

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FROM SIMULATION TO DERIVATION: ARTIFICIAL INTELLIGENCE, POSTMODERN AESTHETICS, AND THE ONTOLOGY OF THE PROBABILISTIC SCREEN

Can DİKER[1]

Introduction: The Computational Transformation of The Cinematic Image

Generative AI has, in recent years, moved to the center of debates on visual culture and creative production. Systems such as Sora, Seedance, Runway Gen-3, and Kling are no longer regarded merely as post-production tools. They are presented as "creative agents" capable of making autonomous aesthetic decisions. Yet this study advances a different claim: reading artificial intelligence through a human-centered conception of creativity conceals a more fundamental transformation. That transformation is the transfer of cultural labor, including the sorting, classifying, and hierarchizing of ideas, to computational processes (Striphas, 2015, p. 395). The real question is not whether an algorithm "can create," but how the ontological status of the cinematic image is being radically transformed.

This change is not a sudden rupture. It is the radical intensification of a longer historical trajectory. In the twentieth century, the passage from the auratic image, "the unique apparition of a distance" (Benjamin, 2008, p. 23), to the regime of pure simulation ("the map precedes the territory," Baudrillard, 1994, p. 1), prepared the ground for a culture in which images no longer represent reality but precede it. The emergence of generative AI is the continuation of this line, but at the same time a distinct break. Consolidating in the early 2020s, this break may be termed a Generative Turn. The digital revolution of the 1990s focused on the numerical conversion of the physical world (Manovich, 2001, p. 27). The Generative Turn, by contrast, shifts toward stochastic sampling from learned distributions. Its technical basis lies in denoising diffusion probabilistic models (Ho et al., 2020) and generative adversarial networks (Goodfellow et al., 2014). These models enable high-quality image synthesis by sampling from complex data distributions.

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Artificial intelligence is one of the most recent stages simulation has reached within postmodern culture. Operating on the basis of probabilistic inference, these systems produce the image not through a referential relation to a particular person, object, or event, but through patterns and probability distributions learned from large datasets. In this process, the image becomes less the record of a pre-existing reality than the result of a computational inference drawn from archival data. This change in the conditions of the image's formation transforms the character of the relation between image and reality, thereby unsettling the historical and ontological foundations of cinema. For this reason, the present study treats these systems less as generative than as derivative systems.

In Hito Steyerl's (2016) words, in this new visuality seeing gives way to probability calculations, and vision is replaced by filtering and pattern recognition. Digital cinema still maintained a bond with pro-filmic reality through scanning and recording (Rodowick, 2007, p. 115). The generative image, however, is not the product of a trace but the result of probabilistic computation. Rather than recording a pro-filmic event, it derives visual configurations from learned distributions. The screen thus turns from a window of representation into an interface where visuality is computed rather than captured, into the Probabilistic Screen. Throughout this study, the Probabilistic Screen designates the screen regime in which the image is derived not from pro-filmic reality but from learned probability distributions.

When the image ceases to be the trace of an event and becomes a sample derived from a probabilistic distribution, the question arises of what foundations cinematic ontology can still rest upon. This transformation is part of a longer historical process extending from the aura to the order of the simulacrum, one that can be grasped through the works of Baudrillard (1994), Jameson (1991), and Lyotard (1984). Within this process, AI systems appear not merely as a new technical instrument but as a mode of cultural production that operates in dependence on archival accumulations. Stiegler's (1998, pp. 246-255) concept of tertiary retention offers an important theoretical basis for explaining how this dependence works. At the same time, Denson's (2020) concept of the discorrelated screen makes it possible to understand how the image's relation to human temporality and experience is being transformed. In this context, artificial intelligence can be regarded not simply as a technical system producing particular

outputs, but as a historical threshold that renders visible the transformation of screen-based visuality and narrative.

Genealogy of The Postmodern Image: From Aura To Algorithm

The turn toward a probabilistic ontology in cinematic production is not, in itself, a technical event. It is the fundamental consolidation of a long-standing shift in the relation between image and world. The aim here is to show how the image, ceasing to be a singular entity, has come to be redefined within increasingly performative and archival processes.

The philosophical source of this transformation is the technical erosion of the image's originality. Walter Benjamin (2008, p. 21) defined the aura of the work of art as its "unique existence in a particular place," an irreducible "here and now" that grounds the object in tradition and authenticity. Describing the aura as "the unique apparition of a distance, however near it may be," Benjamin (2008, p. 23) showed that mechanical reproduction systematically detaches the object from the domain of tradition. Mass existence takes the place of unique existence. The image begins to break away from its singular physical source. Photography still depended on a pro-filmic referent in order to leave a trace. But the decay of the aura prepared the cultural ground for an image that would increasingly break from its source.

Jean Baudrillard radicalized this rupture. The logic of the image is no longer reproduction but simulation. The traditional relation between reality and representation has been reversed: in Baudrillard's (1994, p. 1) famous phrase, "the map precedes the territory." The image passes through four phases: it begins as the reflection of a profound reality; then it masks and distorts that reality; then it masks the absence of a profound reality; and finally it bears no relation to any reality whatsoever, functioning as a pure simulacrum in its own right (Baudrillard, 1994, p. 6). This final phase offers a powerful framework for understanding generative AI: visuality is no longer secondary to a prior reality; it is produced by models that have neither origin nor reality.

Today, generative AI is an advanced stage of this process. As Konzack (2025, pp. 188-189) notes, these systems preserve the form of traditional cinema while transforming the nature of media production through algorithmic simulation.

The aesthetic consequence of this referential collapse was theorized by Fredric Jameson. Jameson (1991, p. 17) defines pastiche as the dominant

mode of postmodernism: a "blank parody" that imitates dead styles, devoid of satirical impulse or historical consciousness. In this regime, the cultural archive is treated like a flattened database composed of equivalent stylistic data points. Historical depth disappears, and the past turns into an archive of signs emptied of its original meanings (Jameson, 1991, p. 18). Artificial intelligence is the technically operative form of this logic: it automates the conversion of stylistic surfaces into high-quality but fundamentally derivative outputs.

Jameson (1998, p. 20) expanded this observation in his later work: the postmodern condition produces a new depthlessness in the image. Reality has turned into images, and the image has become the ultimate commodity. Visual surfaces are consumed as a continuous series of presents severed from their historical continuity.

The intellectual background of the Generative Turn is defined by the collapse of grand narratives. Lyotard (1984, p. xxiv) defines the postmodern condition as "incredulity toward metanarratives." The legitimating power of storytelling has collapsed. In its place, knowledge is governed by the principle of performativity: not truth or meaning, but the optimization of input-output ratios and measurable efficiency come to the fore (Lyotard, 1984, p. 11). Algorithmic production is the technically concretized form of this performative logic. The system operates according to a logic of performativity; outputs are evaluated according to how consistent and predictable the results they produce are (Lyotard, 1984, p. 46).

Yet Lyotard (1984, pp. 60-61) proposes an important concept against performativity: paralogy. Paralogy is a creative leap that changes the rules of the game, producing the unexpected rather than the predictable. In the context of the Generative Turn, algorithmic systems may be seen as the most advanced examples of performative logic. Their operation, however, takes place within the limits of learned distributions. This raises an important question regarding the possibility of radical novelty associated with Lyotard's concept of paralogy. Whereas performativity denotes optimization within existing rules and criteria, paralogy points to the transformation of those rules or the emergence of new ones. Although diffusion models can produce complex and unexpected combinations, they do so within the limits of an existing probability space. For this reason, the question of the extent to which such systems are to be regarded as creative, and to what extent as derivative, retains its importance.

The passage from simulation to derivation is also grounded in the postmodern deconstruction of the individual author. Roland Barthes (1977, p. 146) argues that the text is not a line of words releasing a single theological meaning, but a multidimensional space in which various writings, none of them original, blend and clash. This view directly coincides with the operation of generative systems: the author has been displaced by a tissue of archival citations.

Foucault (1977, pp. 123-124), for his part, defines the author not as an expressive subject but as a functional principle that regulates the circulation of meaning: the "author-function." In AI-driven cinema, this function has become fully automated. The system converts the collective archive into a performative output. The author-function has not disappeared; but it is now distributed not within a singular creative consciousness, but across data sets, training processes, and prompts.

If authorship was never an originary presence but a discursive construction, then artificial intelligence does not so much abolish the author as automate the author-function. Creative production turns from an expressive act into a computational operation. The genealogy extending from Benjamin to Baudrillard, and from Lyotard to Barthes and Foucault, renders the passage from representation to derivation historically intelligible.

Conceptual Distinction: Derivation Vs. Generative Subjectivity

To understand the Probabilistic Screen, one must distinguish the technical definition of generative AI from the claims made about the creative status of these systems. This distinction concerns how the relation between image, archive, and lifeworld (*Lebenswelt*) is conceived.

In the literature of machine learning, the term "generative" denotes classes of models capable of producing new data samples from learned probability distributions. Here, however, the issue is not technical but ontological. A system capable of producing statistically new outputs may be regarded as derivative to the extent that it cannot ground meaning within an intentional and historical activity. For this reason, a diffusion model, though generative in the technical sense, may remain derivative in terms of its operation.

The concept of the "derivative" is not used here in its everyday sense ("unproductive"). It denotes a mode of production that cannot establish its own criteria of value. Three features characterize derivative production. The first is dependence with respect to value criteria: the system cannot determine its own evaluative criteria and relies on external metrics. The

second is statistical mediation; the formation of outputs depends less on intentional judgments than on probabilistic computation. The third is archival closure; the system does not appear to possess the capacity to produce new conceptual frameworks that exceed the limits of its training data.

Manovich and Arielli (2024) call the traditional priority of human agency the "anthropocentric myth of creativity." This myth ignores how aesthetic production has been scaled beyond human craft. In the age of artificial aesthetics, the focus shifts from the romantic conception of the singular genius to the probabilistic management of visual style.

Yet the framework proposed here differs from Manovich and Arielli's (2024) more conciliatory approach. These authors argue that generative AI inaugurates a genuinely new aesthetic regime in which the boundaries between tool and co-creator are productively blurred. Their concept of "artificial aesthetics" emphasizes the unprecedented scale of AI systems' capacity to simulate, interpolate among, and hybridize existing aesthetic traditions (Manovich & Arielli, 2024, pp. 152-157). Manovich (2018, pp. 8-9) likewise argues that, in its current state, cultural AI essentially functions as an assistant within human-directed creative workflows, reinforcing rather than displacing aesthetic agency; yet he acknowledges that this relation may be radically transformed as automation continues (Manovich, 2018, p. 11). This framework is valuable for recognizing the quantitative transformation in aesthetic production. But it does not sufficiently address the qualitative operational distinction that this chapter foregrounds. To be able to produce transitions among ten thousand stylistic traditions at computational speed is not the same as being able to reject all ten thousand and propose, on the basis of normative judgment, a ten-thousand-and-first. The derivative framework advanced here does not deny that AI produces aesthetically interesting or culturally meaningful outputs. It argues that these outputs remain dependent on the value criteria of the archive from which they are derived, and that the system cannot constitute its own evaluative criteria.

Human cultural production has been shaped by linguistic structures and cultural archives; this cannot be denied. Yet human creativity possesses capacities not found in algorithmic systems: the ability to take a distance from the archive, to question established criteria, to risk failure, and, when necessary, to reject prevailing values. A human creator may choose to work against the logic of optimization. Algorithmic systems, by contrast, operate

by their very functioning within performative criteria. This asymmetry constitutes the basis of the fundamental distinction defended here between human creativity and algorithmic derivation.

This derivative status becomes still clearer through Vilém Flusser's (2000, pp. 26-27) framework. Flusser defines the apparatus as a black box containing a pre-set program of possibilities. Within this framework, the individual is reduced to a functionary who plays with the apparatus by consuming combinations already implicit within the program. A similar situation obtains in generative AI: the human, as prompt writer, acts as a functionary of the latent space; the creative act is limited to selecting from among the vast but finite distributional permutations the algorithm offers. Visual production turns into a game played against the apparatus. The output remains fundamentally bound to the parameters of the computational program (Flusser, 2000).

To characterize AI as "generative" presupposes an autonomous creative subject. This study objects to that presupposition. AI-driven production can be more accurately understood through Bernard Stiegler's (1998, pp. 246-255) concept of tertiary retention. For Stiegler, human consciousness is bound to technical objects that function as externalized memory. Cinema is a paradigmatic time-object that structures collective experience. Artificial intelligence, by contrast, automates the recombination of patterns accumulated within a technical archive. It does not produce meaning out of an experiential void; it carries out a computational derivation from a pre-structured technical memory. The algorithm is fundamentally dependent on the collective accumulation of human visual culture. The AI image relates to the world not directly but through previously produced representations (Stiegler, 1998). For this reason the distinction defended here is not technical but ontological: the issue is not whether the systems can produce new outputs, but in what sense they produce them.

The gulf between human creativity and algorithmic output becomes still clearer through Hubert Dreyfus's (1992) critique of artificial reason. For Dreyfus, human intelligence is situated within a lived world (Lebenswelt) that supplies the context necessary for meaning. AI systems, by contrast, operate through computational correlations that lack lived, embodied situatedness. As Dreyfus (1992, pp. 11-12) shows, computer knowledge consists of formalized rules that are not situated within a world.

Manovich (2018, p. 4) expands this point: contemporary algorithms can construct complex aesthetic structures, but they do not possess a human-like grasp of social meanings or historical contexts. In the age of artificial aesthetics, the scale of content production exceeds human craft, and the focus shifts from individual creativity to the computational management of vast cultural datasets (Manovich & Arielli, 2024, p. 11). Applied to cinematic production, the situation is as follows: a human filmmaker makes aesthetic choices grounded in historical or emotional context; an AI system, by contrast, selects a visual configuration grounded in statistical plausibility. The basis of visual production shifts increasingly from intentional choices to probabilistic inference.

The Mechanism of Derivation: Representation vs. Stochastic Sampling

With AI-assisted image production, a marked shift is observed from a logic of representation toward a logic of production based on probabilistic sampling. In the representational regime, the image, however simulated or mediated, preserves its bond with a prior reality or creative intention. In the derivative systems referred to as generative AI systems, by contrast, the image increasingly takes on the character of a probabilistic sample derived from a latent distribution. The technical basis of this transformation was established by generative adversarial networks (Goodfellow et al., 2014) and denoising diffusion models (Ho et al., 2020). Unlike Rodowick's (2007, p. 115) approach, which defines the digital image as "the numerical translation of a world," here the image is constructed less by translating a specific referent than by inference from existing patterns. For this reason, generative AI points to a new visual regime in which, moving away from the indexical foundations of the image, patterned approximations become more decisive.

The passage from representation to derivation becomes most clearly visible on the screen. In AI-assisted visuality, the screen moves away from being a surface that represents the world and turns into an interface where probabilities are computed and visual structures are derived. The works of Rodowick, Denson, and Shaviro offer important conceptual tools for understanding this transformation. Within this framework, the Probabilistic Screen too may be regarded as a technically institutionalized form of post-referential tendencies.

The historical function of the cinematic screen has been built upon correlation: the correlation between image and world, image and event, image and intentional gesture. Even in their digital transformations, cinema

preserved a minimal assumption that the image carries the trace of something prior to itself. With generative systems, a different condition emerges: the screen is no longer necessarily related to a pro-filmic event, but to a patterned probability distribution.

In classical cinematic ontology, the photographic image functioned as a trace: in Bazin's (1967, p. 14) words, an objective record that shares the existence of its model. According to Rodowick (2007, p. 115), in digital ontology the image becomes the numerical representation of the pro-filmic world; virtual, yet fundamentally still referential. By replacing chemical-based film with binary code, digital cinema shook indexicality but did not entirely abolish the referential horizon. Although the image was processed in digital form, it still owed its existence to recording processes grounded in a reality before the camera.

With generative AI systems, the character of the image's relation to the referent changes. The image can now emerge not only as the record of a particular event or object, but also as a structure derived from learned data patterns. Thus, as the real world moves away from being the necessary starting point of image production, the relation between image and reality comes to be established through processes of probabilistic inference rather than direct recording.

Shane Denson (2020) defines discorrelation as the severing of images from human temporal experience and sensory-motor coordination. Digital media had begun this process; generative systems carry it beyond the perceptual field. The generative image is not accidentally incompatible with human perception; it is operationally aligned with model optimization. Its primary relation is not to lived temporality but to the patterned structures of latent space.

As Denson (2020, pp. 41-42) notes, discorrelated images are produced through machinic processes that operate differently from the temporal rhythm of human experience. In the context of generative AI, the screen increasingly moves away from being a surface on which the relation between subject and world is established, and turns into an interface where the operations between datasets and computational outputs become visible. In this case, visuality emerges as the result of processes shaped not according to human perception but according to the probabilistic operation of the model.

The affective dimension of this shift was theorized by Steven Shaviro (2010). Post-cinematic affect is a regime of surface intensities produced by algorithmic media. In Shaviro's (2010, p. 31) observation, as digital media reorganize sensation, the traditional depth of the cinematic image is replaced by a flat, computational affect. In the Generative Turn, this affective effect is heightened still further through probabilistic optimization.

The uncanniness often associated with AI images arises not from a failure to achieve realism but, on the contrary, from an excessive plausibility. The reason is that these systems gravitate toward the most probable patterns of learned distributions. The image appears hyper-coherent because it is shaped by the most probable patterns within the model's learned distribution. For this reason, the sense of reality that arises in the viewer is fed less by the image's recording of an event than by its appearing statistically convincing.

The Probabilistic Screen

The Probabilistic Screen designates a derivative visual order in which images emerge not as the record of a particular event but as computational outputs derived from datasets. In such a regime, the referent moves away from being the necessary precondition of the image; and the operation of image production becomes increasingly opaque and complex. Visual coherence now rests not only on an indexical relation but also on processes of probabilistic modeling. For this reason, it is possible to think of the screen less as a window onto the world than as a dynamic field in which visuality is continuously reproduced and computed.

The transformation of the screen into a probabilistic interface has profound consequences for spectatorship. Film theory, extending from Hugo Münsterberg to Christian Metz, examined the spectator's psychological and perceptual engagement with cinematic images. AI images compel a rethinking of this engagement.

The spectator who encounters the Probabilistic Screen moves away from Metz's (1982) concept of the "imaginary signifier." In Metz, cinematic belief was structured through the interplay of presence and absence. In the generative regime, the absence of a pro-filmic grounding shakes the psychological conditions of this regime of belief.

The spectator's relation to traditional cinema rests on a fundamental but mostly implicit trust: trust that images carry some kind of relation to a world. Even in fictional cinema, the spectator trusts that images are

intentionally composed, that behind them lies an authorial intelligence selecting and arranging visual elements according to aesthetic aims. This trust grounds hermeneutic interpretation: the spectator tries to interpret images because she trusts that they were designed to mean something.

The Probabilistic Screen transforms the traditional relation of trust established with the cinematic image. When images are produced less through an intentional process of creation than through computational mechanisms of derivation, some of the assumptions on which the act of interpretation rests are also opened to question. AI images can of course invite the viewer's interpretation and affective engagement; but the basis of this interpretation may not be an authorial intention in the traditional sense. For this reason, the question of where and how meaning is constructed acquires renewed importance. In the context of AI production, meaning must be thought through the relation between the conditions of the image's production and the interpretive activity of the viewer.

The crisis of trust deepens further with the erosion of what Vivian Sobchack (1992, p. 23) calls "the address of the eye." Cinematic vision involves an embodied and situated subjectivity. When the screen functions no longer as the trace of an intentional gaze but as a probabilistic interface, the spectator's phenomenological experience begins to break away from lived perceptual structures.

Traditional cinema organizes the spectator's temporal experience through the rhythm of events and the progression of narrative. The spectator trusts that this organization serves expressive aims. AI sequences may exhibit temporal coherence, but it is difficult to show that they exhibit intentional temporal structure. The spectator's temporal experience breaks away from authorial guidance.

Moreover, the Probabilistic Screen introduces a new form of uncertainty into spectatorship. Traditionally, the spectator's uncertainty concerned the fictional world: what will happen next, how will the story be resolved? In AI content, by contrast, an uncertainty arises regarding the image itself: did a human create this image, or did an algorithm produce it? This uncertainty foregrounds the question less of what the image shows than of what kind of image it is.

Cinematic Analysis: AI Production In Practice

AI-assisted media production offers a domain in which the conceptual transformations discussed so far can be concretely observed. Current

examples show how derivative logic operates within image-production processes and in what forms it becomes visible.

Even before the Generative Turn, experiments demonstrating the archival dependence of algorithmic production had been carried out. The 2016 short film Sunspring was written by an LSTM-based recurrent neural network. The film exhibits what might be called syntactic coherence devoid of semantic depth: the dialogues follow the grammatical patterns of dramatic screenwriting, the visual arrangements adhere to genre conventions, and the performances refer to familiar emotional registers. But the film lacks narrative intentionality; it produces the form of cinema without its meaning.

That said, Sunspring remains a limited case for the Generative Turn. Its technical architecture differs fundamentally from the diffusion models that define contemporary AI image production. The LSTM model produced text sequences, which were then staged by human actors in a traditional setting. The images themselves remained indexically grounded in pro-filmic reality. While Sunspring remains within the representational regime at the level of the image, it is a transitional example bearing the first signs of derivative logic.

One of the most striking examples of the Generative Turn is Sora, introduced by OpenAI in 2024. This text-to-video diffusion model represents a new phase in which image production rests increasingly on probabilistic inference. Unlike earlier models that merely predicted character sequences, Sora can derive complex visual structures through patterns learned from training data (Ho et al., 2020). This is significant in that it shows the weakening of the pro-filmic world's status as the necessary starting point in the production of the cinematic image.

Platforms such as Sora and Runway Gen-3 Alpha compute the most probable visual sequences on the basis of patterns in vast video databases and produce video from textual prompts. Resting on diffusion models and transformer architectures, these systems concretize the passage from indexical capture to computational inference. What distinguishes these platforms from earlier digital tools is their relation to the referent. CGI and digital compositing still operated within a representational logic: they aimed to simulate or enhance a pro-filmic reality. Sora and Runway Gen-3, by contrast, produce visual sequences that have no necessary relation to a prior event. The output is not the representation of something; it is the computational optimization of visual patterns within the training data.

Viewed from this theoretical framework, these systems exemplify Baudrillard's fourth order of the simulacrum: they are pure simulacra produced from within a closed system of signs and correlations, their relation to reality mediated entirely through patterned abstraction rather than indexical recording.

This transformation can be concretized through close examination of specific outputs. When a user gives Sora a prompt describing an uninterrupted tracking shot down a Tokyo street at night in the rain, the system produces a video sequence of remarkable visual coherence: neon reflections ripple across wet asphalt, pedestrians move with plausible walking patterns, and the parallax between foreground and background suggests spatial depth. But this coherence is entirely probabilistic. No camera moved down a Tokyo street. No rain fell on any surface. No neon sign was photographed. The image is a probabilistic composition derived from the model's learned distribution of urban night scenes.

This computational origin becomes visible in two ways. The first is the principle of indeterminacy. Diffusion-based production works, by design, through probabilistic sampling; entering the same prompt at different times produces visually different outputs. Each is a different probabilistic sample from the same latent distribution. This indeterminacy is not a technical defect but the hallmark of probabilistic derivation: it shows that there is no single "designed" image beneath the production process. In traditional cinema, re-shooting a scene produces differences grounded in pro-filmic contingency. In generative production, by contrast, variation lies in the very nature of sampling from a probability space.

The second is aesthetic convergence. The outputs of Sora or Seedance consistently gravitate toward the visual configurations dominant in the training data: conventions of cinematic color grading, the aesthetic of shallow depth of field, and compositional patterns derived from contemporary digital cinematography. This convergence exemplifies the regime of aesthetic saturation in which statistical plausibility takes the place of indexical authenticity as the basis of visual coherence. The produced image does not appear "real" because it records reality; it appears "real" because it has been optimized according to the statistical regularities that define "realism" within the training archive.

A similar observation holds for Runway Gen-3 Alpha's video-to-video capabilities. Here derivative logic operates at a second level: the system

derives not from a textual prompt but from the combination of a source video with learned aesthetic distributions. The outputs are doubly mediated: derived from representations of representations. The Probabilistic Screen is not merely a theoretical construct but a functional reality observable in the formal features of contemporary AI media.

Comparative Analysis: AI Production and Digital Compositing

To sharpen the ontological distinction, it is useful to compare AI production with digital compositing. The CGI in *Jurassic Park* (1993) creates photorealistic dinosaurs that never existed before the camera. But the images remain referential: they represent imaginary creatures in a fictional world, guided by the intentional choices of directors, animators, and designers. Every scale, every movement, every shadow reflects conscious aesthetic decisions. The CGI dinosaur is not indexically real, yet it is grounded representationally within an authorial vision.

Creatures produced by AI, by contrast, emerge through a fundamentally different process. The system does not represent an imaginary creature; it derives a probable visual configuration from patterns in the training data. The result may be visually complex, but it lacks the intentional structure that binds the image to a creative vision. The distinction concerns not only the technical process but the operational status: the CGI image is a representation (fictional though it may be); the AI image is a derivation (novel though it may be).

This comparison also illuminates the key aspect of the derivative regime: it eliminates not visual complexity but only intentional grounding. AI can produce technically impressive, affectively engaging, commercially viable images. What it cannot produce is content that derives its meaning from an intentional frame and is disclosed within a process of interpretation. Viewers will naturally find meaning in AI images. But this meaning is something we bring to the screen; it is not a conscious message left behind by an author but a projection from the viewer.

The analytic framework can also be tested against intermediate technologies that complicate the duality between indexical and derivative production. The motion-capture technology used in *Avatar* (2009) and the *Lord of the Rings* trilogy (2001-2003) is an instructive case. The movements of human performers are digitally recorded and transferred to computer-generated characters. The resulting images are neither fully indexical (they do not show what was before the camera) nor fully derivative (they derive from

actual human performances). Motion capture occupies a position right at the threshold. The technology preserves what might be called "performative indexicality": even though the visual surface is computationally produced, the image retains the trace of intentional human action. Andy Serkis's movements as Gollum are intentional choices grounded in an actor's interpretation of a character; the digital skin covering those movements is representational, not derivative. This hybrid status distinguishes motion capture from AI production, in which no human performance grounds the output.

The LED volume stages used in *The Mandalorian* (2019-present) are another intermediate case. These systems project pre-rendered environments onto vast LED screens, which are photographed alongside live actors. The resulting images combine indexical elements (actors photographed in real time) with pre-computed backgrounds. But the pre-computed environments are representational: they are imaginary spaces designed by human artists according to intentional aesthetic criteria. The LED volume does not produce environments through patterned derivation; it displays environments constructed representationally.

These intermediate cases clarify the specificity of AI images. The distinguishing feature is not digital mediation itself or the absence of a pro-filmic referent, but the replacement of intentional representation with computational derivation. Motion capture and virtual production remain within the representational paradigm. AI production marks the passage to a derivative paradigm in which statistical probability takes the place of intentional design.

Formal Organization In AI Cinema: Temporality, Montage, and Mise-En-Scène

Cinema is fundamentally a temporal art. The arrangement of shots in time through editing creates meaning that exceeds the content of individual images. Eisenstein's theory of montage, Bazin's advocacy of the long take, and Deleuze's analysis of the time-image all emphasize that cinematic meaning arises through temporal articulation. How does AI video relate to this temporal dimension?

Current AI video-production systems exhibit temporal coherence at a superficial level: objects persist across frames, movements follow plausible trajectories, and lighting remains consistent. But this coherence is not intentional but computational. The system produces frames that are

probable relative to previous frames, rather than developing a narrative or thematic logic.

The distinction becomes clear when the function of the cut is considered. An edit is not merely a transition between shots; it is a meaningful juxtaposition that creates associations, contrasts, or rhythms. As the Kuleshov effect shows, meaning arises not from individual shots but from the relation between shots. There is as yet no strong evidence that AI systems establish meaningful temporal relations. They can produce sequences of temporally coherent frames; but they cannot create the intentional temporal articulation that constitutes cinematic montage.

Similarly, traditional film analysis examines how directors use mise-en-scène and framing to construct meaning. These elements presuppose intentionality: each choice is an aesthetic decision oriented toward expressive aims. In AI video, these elements are present but function differently. The algorithm produces arrangements that are computationally probable according to the training data, rather than ones expressing intentional meaning. When an AI system produces a scene with a particular lighting scheme, it does so not because the lighting expresses a particular mood, but because that scheme appears frequently in similar contexts within the training data.

This distinction has important consequences for film analysis. Traditional methods assume that formal elements are bearers of meaning, reflecting interpretable intentional choices. AI content unsettles this assumption by producing formal complexity without intentional grounding. How such content is to be analyzed, and whether traditional hermeneutic methods remain valid, is an ongoing challenge for film and media studies.

Critical Limits of The Derivative Framework

The distinction between human creativity and algorithmic production is not as uncontested as it is often supposed to be. Especially where the concepts of intention, authorship, and novelty are concerned, the boundary between human and machine is not always clear. For this reason, it is necessary to address the principal objections that may be raised against the derivation thesis. What matters here is less to dispose of these objections than to show which problems the derivation thesis can explain and at which points it falls short.

The claim that AI systems lack intentional grounding meets a historically rich counterexample: a long artistic tradition that deliberately relinquishes

conscious control. Surrealist automatic writing, Burroughs's cut-up technique, and above all John Cage's chance-based compositions demonstrate that some of the most consequential creative works of the twentieth century arose from processes designed to circumvent the artist's conscious intentions. If Cage could compose *Music of Changes* (1951) through the *I Ching*, a text of Chinese origin he used to make chance selections, producing sequences no human mind had planned in advance, what distinguishes this from an algorithm sampling from a learned distribution?

The distinction lies not in whether intention is present at the level of output, but in the higher-order intentional frame within which the work is situated. Cage (1961, pp. 10-11) did not arrive at indeterminacy by chance; he developed a comprehensive aesthetic philosophy in which the composer's role shifts from controlling sound to organizing the conditions under which uncontrolled sound might emerge. The decision to relinquish control is itself an intentional act: it rests on a critical relation to the history of Western composition and on a conscious rejection of that history's assumptions. A chance-based work, even when its content is left entirely to chance, arises as the result of an intentional aesthetic choice.

AI systems operate outside any such horizon. Statistical production is not a path these systems choose but their mode of operation. They cannot evaluate their outputs against artistic aims. The difference is between creative practices that can reflect on intention and processes that possess no such capacity.

Yet this clarification leaves a more pressing question unresolved: what happens when human creators and AI work together? Today, artists increasingly make generative tools part of their workflow, and the derivative framework must address this reality without lapsing into unhelpful dichotomies. The most honest characterization is that human-AI collaboration occupies a spectrum. At one end, the artist makes every significant aesthetic decision and treats AI outputs as raw material to be critically evaluated; here the final work retains its intentional grounding. At the other end, the human functions essentially as a prompt engineer, with the system making most aesthetic determinations; here the output is predominantly derivative. The critical question is not whether AI participates in the process, but whether the final work remains bound to a horizon of intentional meaning-making.

A more serious theoretical objection comes from the very structuralist and post-structuralist traditions on which this chapter draws. Barthes (1977) and Foucault (1977) showed that authorship was never a matter of originary individual expression: it is always a discursive construction shaped by language, tradition, and institutional power. Bourdieu (1993, pp. 29-30) deepens this challenge: cultural production operates within a field of objective relations in which creative choices are shaped by habitus, social position, and accumulated cultural capital. If human artists are themselves fundamentally determined by forces they do not fully control, what makes them fundamentally different from algorithms determined by their training data?

The derivative framework does not reject this structural mediation; on the contrary, it takes it as a point of departure. It is not claimed that human creators operate in some pristine space of autonomous expression, free of cultural conditioning. On the contrary, even under the most thoroughgoing cultural determination, human agents retain the capacity to approach critically the archive that shapes them, to question existing values, to choose to produce works optimized according to no criterion, and, when necessary, to refuse. These are not romantic fantasies about autonomous genius; they are observable features of how human beings relate to cultural materials. An artist can reject the entire tradition that formed her. An algorithm cannot reconstruct its relation to its training data critically in the way human agents do.

Whether this asymmetry marks a permanent distinction or results from a technical limitation specific to the current stage of AI development is a question that has not yet found a definitive answer. What can be said today is that, under present conditions, this asymmetry is real and consequential for how we understand the structural status of the images these systems produce.

Perhaps the strongest objection to the derivative framework concerns the nature of novelty. AI systems sometimes produce outputs that surprise their designers, and in some cases put forward visual combinations never seen before. If the system can genuinely produce the new, does this invalidate the claim of archival closure?

To answer this question, a distinction must be drawn between combinatorial novelty and conceptual innovation. Diffusion models can combine visual elements not previously found together in the training data by sampling

from the low-probability regions of their learned distributions. This may count as genuine novelty at the combinatorial level. But this novelty arises within the limits of the system's learned probability space. The system recombines existing elements in unexpected ways; but it does not propose new criteria for what counts as valuable, meaningful, or important. For this reason, producing unexpected outputs and putting forward a new conceptual framework are not the same thing.

AI hallucination sharpens this point rather than refuting it. When a generative system deviates markedly from the patterns in its training data, those who develop these systems regard this not as an indication of innovation but as an error to be corrected. Development efforts are consistently directed toward reducing hallucination, toward ensuring that outputs more faithfully reflect the statistical structure of training archives. What matters here is that systems called generative aim not to exceed the archive but to remain as faithful to it as possible. While the unexpected outputs of human creators are often regarded as innovation, similar deviations in AI systems are generally classified as error. This asymmetry is not merely semantic; it reflects a deeper asymmetry in the structural relation each bears to its materials.

Finally, the relation AI images establish with reality opens a separate area of discussion. It would be wrong to say that these images are entirely disconnected from reality; the training data encodes regularities concerning the world, and AI outputs reflect them. Yet two different forms of referentiality are at issue here. Traditional referentiality relates the image to a particular person, object, or event: the meaning of the photograph or the shot rests on the world it has recorded. In AI outputs, by contrast, the relation is established not with particular referents but with general patterns that characterize a class of images. The former grounds interpretation and attribution of meaning; the latter does not. The erosion of specific reference, even if the connection with the world is not entirely severed, points to a significant epistemological transformation.

Ethical and Political Implications

As image production rests increasingly on probabilistic models, it becomes necessary to rethink the fundamental concepts of cinematic culture. As images move away from being the record of particular events and emerge as the result of probabilistic inferences drawn from datasets, concepts such as authorship, spectatorship, and collective memory must also be approached

in different ways. This transformation is closely bound up with the increasingly central role of computational systems in processes of cultural production (Striphas, 2015, p. 395).

In the probabilistic regime, the character of authorship changes. The creative subject shifts away from being the direct producer of the image and toward a position that guides the production process and defines its limits. Considered together with Foucault's (1977) concept of the author-function, this points to the re-emergence of authorship as a function bound up less with individual meaning-production than with the regulation of discourse. In generative systems, creative intervention shifts increasingly from the direct construction of the image toward the design of prompts, the making of selections, and the taking of guiding decisions among outputs. In this context, the author does not disappear entirely, but his position and function within the production process are transformed.

The spread of production models based on archival data has also brought with it significant political and economic debates regarding creative labor. In the 2023 WGA and SAG-AFTRA strikes in Hollywood, the impact of AI systems on screenplays, performances, and other creative outputs was one of the central points of contention. In particular, how content produced through human labor would be used in training AI models, and what consequences this use would have for copyright, remuneration, and professional rights, were intensely debated. These debates render visible the tension between algorithmic efficiency and the protection of creative labor.

When AI is positioned as a derivative machine, it does not merely automate tasks; it relies on data structures derived from the historical and stylistic labor of human creators in order to feed a probabilistic output. The training data of generative systems consists of countless hours of human creative labor, converted into computational models and then sampled without attribution or payment. The Probabilistic Screen thus becomes an industrial field of conflict in which intellectual property policies and the survival of human authorship are materially at stake.

Dependence on archival distributions harbors serious risks for collective memory and cultural diversity. Generative systems tend to privilege the high-density regions of the learned distribution (Goodfellow et al., 2014). In Steyerl's (2016) warning, in this sea of data seeing has given way to pattern recognition and probability calculations. Production based on statistical averages may push non-standard aesthetic traditions and historical

specificities into the background, thereby encouraging visual homogenization.

A serious risk of creative homogenization is present here. Algorithmic production automates and reinforces the biases and stylistic limitations within the cultural archive. When AI derives new content, it does not merely repeat historical patterns; it carries out a computational pastiche that systematically privileges statistical averages over innovative, marginal, or culturally diverse forms of expression. Collective memory is reshaped through algorithmic selection; the probabilistic plausibility of the archive threatens to erase marginalized voices and non-Western aesthetic traditions.

Spectatorship is turning from a practice of interpretation into a practice of navigation. In the representational regime, the viewer was the interpreter of a stable, authored narrative. On the Probabilistic Screen, by contrast, the viewer witnesses a computational actualization in continuous flux. Because the image is derived through probabilistic sampling, each instantiation is a separate probabilistic event (Ho et al., 2020). This produces a condition of prompt-driven spectatorship, in which the viewer interacts with a system possessing the capacity for infinite variation. The cinematic experience becomes structurally unstable; it moves from a fixed temporal object toward a dynamic, computed output.

The epistemological consequence of this transformation is a profound loss of historical consciousness. The viewer of AI content can no longer reliably distinguish between an image grounded in human experience and an image derived from patterns in training data. The inability to perceive the absence of a creative origin is the point at which the processes analyzed throughout this study arrive: the decay of the aura (Benjamin, 2008), the precession of simulacra (Baudrillard, 1994), the delegitimation of narrative (Lyotard, 1984), and the waning of affect (Jameson, 1991). This may be regarded as one of the most significant ethical and epistemological consequences of derivative systems, for it transforms the ways in which we attribute meaning to the image.

Conclusion: The Infrastructural Formalization of Simulation

This study has argued that the systems commonly called generative AI can be more accurately understood as derivative systems. Tracing the genealogy of the image from the displacement of singular existence (Benjamin, 2008, p. 23) to the precession of simulacra (Baudrillard, 1994, p. 1), the study has identified the early 2020s as a significant break in the history of the image.

The Probabilistic Screen is the field in which the existence of a pro-filmic world is no longer structurally necessary for image synthesis. It is a screen form in which visuality is derived from learned data distributions; it is one of the most visible forms of the discorrelation between image and human experience (Denson, 2020). The digital cinema of previous decades focused on the numerical representation of the pro-filmic world (Rodowick, 2007, p. 115). The generative regime, by contrast, rests on the recombination of patterns sedimented within a technical archive (Stiegler, 1998, pp. 246-255).

In the framework proposed by this study, AI systems may be regarded less as generative than as derivative systems in the structural sense. They exhibit impressive combinatorial efficiency and can produce new outputs in a narrow distributional sense. But their lack of subjective intentionality, historical consciousness, and evaluative judgment associates them with processes of patterned recombination rather than intentional creativity. They do not produce meaning through intentional activity; they recombine relations learned from data distributions. Viewed through the lens of Lyotard's concept of performativity and Jameson's analysis of the waning of affect, the operation of AI systems rests on optimization rather than the production of meaning. It automates the "blank parody" of postmodern pastiche; it converts the vast archival accumulation of human culture into recombinable data patterns, largely disregarding historical contexts and cultural meanings.

The ethical and epistemological challenges this transformation poses (such as algorithmic opacity, creative homogenization, the erosion of critical distance, and the politics of memory) are not technical problems that can be solved through improved design or stricter regulation. These problems arise from the fact that, in image production, computation, probabilistic inference, and optimization become decisive rather than intentional expression and recording. To recognize these challenges is not to reject AI technology or to long for a nostalgic return to pre-digital cultural production. It is to insist on the necessity of critical awareness and theoretical vigilance in confronting the ongoing transformation of screen-based culture.

To acknowledge the derivative nature of generative systems is a necessary step toward a critical visual literacy. The future of screen studies must address the ethical and epistemological consequences of a computed visuality. Contemporary platforms such as Sora, Seedance, Runway Gen-3, and Kling show how the Probabilistic Screen is increasingly organized

around probabilistic interfaces rather than authored narratives. The real question is not whether computational image production will be accepted, but on what conceptions of knowledge and value these systems are built. For this reason, the real issue is not whether AI will bring about the end of cinema, but under what conditions cinematic storytelling can continue to produce meaning, intention, and creativity together with derivative systems.

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THE REPRESENTATION OF TECHNOLOGICAL ORDINARINESS IN *AFTER YANG* WITHIN THE CONTEXT OF POST-DIGITAL CULTURE

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Introduction

Throughout history, new technologies have been described as 'revolution' or 'turning point' in reference to their transformative power and the strong expectations they generate about the future. The functional innovations introduced by each new technology have been perceived as a fundamental rupture, fostering the belief that a new era—radically different from the one that preceded it—has begun. The primary element in these innovations being regarded as major turning points has been their character, which transcends mere technique and transforms everyday life, social relations, and the nature of modes of cultural production. The fact that this change often involves an uncertain transition period has frequently led to debates about the possible direction of progress.

The new cultural regime shaped by the emergence of digital technologies has also been largely defined through discourses of transformation and rupture. Digitalization, which disrupted the dominance of analog systems, paved the way for computer technologies, the widespread and personal use of the internet, and the rise of new communication technologies based on interaction and networks. The theoretical harbinger of this transformation was the conceptualization of new media. The concept has become a discursive tool that has understood and positioned digitalization as a force that goes beyond the dimension of mere numerical change; transforming forms of thought, perception, and communication. Although it appears to be a simple and ordinary term, it in fact encapsulates both a narrative of historical progress and an ideological representation. Within a linear conception of history, technologies that abandon the 'analog and old' and embrace the

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more advanced 'digital and new' are considered turning points, offering more democratic, individual-centered, and participatory opportunities.

However, the long-term nature of this transformation has become increasingly apparent, revealing the need for interpretations that emphasize complexity and continuity rather than rupture. As digital technologies become an ordinary and natural part of daily life, the initial emphasis on a singular and irreversible rupture has faded; the idea of a continuous and layered transformation has come to the fore. Losing its exceptional status and being relocated to an infrastructural level, the digital has come to be understood as an invisible element intertwined with everyday practices. The term 'post□digital' has been used to describe this period in which more dramatic and sharp discourses have faded, and digital technologies have become fully integrated into everyday life. While the age of digital culture was a phase that celebrated novelty and exciting transformations, post□digital culture points to the taken□for□granted presence of the internet and digital tools in everyday life. Dewdney and Sluis (2022, p. 7) describe the state in which digital technologies, after producing an initially profound impact, become the natural ground of culture as "a diffuse and paradoxical condition." Disruptive innovations have occurred and, in doing so, have lost their revolutionary quality, becoming a hegemonic part of life. Consequently, the post-digital identity of culture refers to an era in which the cultural impact of technology has lost its innovative edge, become normalized and open to critique; in which these technologies can be situated within broader historical-technical processes of transformation that precede and follow them.

Although technological innovations constitute the founding elements of this moment, the term itself primarily focuses on the cultural and aesthetic layers of meaning that emerge, as well as on the fields of influence it creates in perception, subjectivity, modes of expression. As Cramer (2015) notes, the emergence of the post-digital fundamentally as a definition of media aesthetics should be understood within this context. In post-digital culture, art's privileged position manifests itself in the transformation of artistic production practices and the emergence of a critical field of expression that opposes the flawless aesthetics of digital tools. Rather than prioritizing technical innovation, marginalizing aesthetic experience, and making technological transformation itself the central theme—as was characteristic of digital art—the emphasis has shifted toward the experiences of the subject. In this sense, cinema, which deeply feels the effects of digitalization due to its technique-dependent nature and undergoes a crisis of identity, is a particularly

productive art form for tracing the imprints of this transformation. In the era of digitalization, cinema has undergone visible technical transformations and has even faced questions about its continued existence, yet it remains a powerful medium for representing cultural change at the narrative level.

In cinema, the post-digital condition is concerned with the representation of reality in a world where the digital—rather than being centrally represented within the narrative—constitutes the background. Rather than showcasing digital itself, it makes visible the everyday life, visual and perceptual experience of the post-digital subject. Digital interfaces, infrastructures, memory and recording systems, media technologies, algorithmic systems, etc. continue to exist as extensions of everyday life without being the focus of attention, while quietly shaping the form of representation. This ordinariness makes them visible as components of a cultural experience that technology has already shaped profoundly. In this sense, these elements are not dramatic devices but manifestations that assist a conceptual interrogation of post-digital culture. Consequently, at the core of such narratives, there is "nothing to learn" about our invisible digital infrastructures and the future imaginaries associated with them (Bridle, 2011). Within this framework, the present study focuses on the film *After Yang* (Kogonada, 2021), which does not feature surprising or unfamiliar technologies, but instead internalizes the elements it employs as natural components of its narrative world. By positioning digital technologies as an environmental condition rather than the central concern of its dramatic structure, the film provides a particularly productive ground for discussing cinematic representations of post-digital culture and for analyzing its effects within a narrative context.

The Rejection of Teleological Culture In The "Post-Digital" Era

Since the 1990s, digital technologies which have spread to every area of life, have been seen as tools that inspire admiration with their promise of a progressive future. However, as they fulfilled their function, they became commonplace and lost their surprising aspect, leading to digitalization being treated as a completed technological development. As Lund (2015) states, this phenomenon, which lost its extraordinary quality over time and became a natural part of the concrete world and cultural production, has no brand new and distinctive aspect. Thus, the digital, has inevitably lost its magic by having become commonplace, and that situation, combined with the void created by expectations of successive progress, has given rise to a new question. This question about what comes after the digital in the social, cultural, and aesthetic context has brought a search for a new conceptual perspective.

The concept of post-digital, which emerged in response to these needs, points to what Russell Davies (2011) calls "the digital becoming real" and develops a critical perspective against teleology. However, at this point, it is important to distinguish between the terms "post-digital" and "after digital," noting that the prefix "post" does not simply signify a technological era in which the digital has ended and surpassed. The digital has not ended; on the contrary, it has become ubiquitous by attracting attention not with its pervasive presence but with its absence.

Interpreting the meaning of the post-digital concept solely as "after digital" may lead to misunderstanding by creating the perception that we have entered a new era where the digital has come to an end, and it will fail to adequately convey the critical inquiry underlying it. Cramer (2015) suggests looking at other concepts we have created using this prefix to understand this effect. As concepts such as post-colonialism, post-structuralism, post-feminism, or postmodernism also show, meaning involves a critical distance rather than crossing a threshold. This expression does not imply a mandatory linear understanding; rather that it expresses the changes we need to grasp in a more nuanced, continuous manner and the field of relationships that is being reorganized. In their analysis, Sinclair and Hayes (2019) build on Lyotard's conception of postmodernity, emphasizing the linguistic role of the prefix as a productive approach to interpreting and articulating the post-digital condition. The idea discussed here is the insistence, as Jameson (1984) also states, on not perceiving postmodernism as a historical break or a radical response to the legitimacy crisis of modernism. The relationship between the post-digital and the postmodern is established in the context of, critical approaches to the claims of modernity and, forms of reorganization within a field of historical continuity. Consequently, it can be said that post-digital rejects teleological (purposeful) narratives by positioning itself against the controversial philosophical perspective of the "post" prefix. Although the concept inevitably addresses technology's role in changing human practice, it takes an opposing position by refusing to align with the Enlightenment values of modernist thought.

From another perspective, despite addressing the same transformation, the concept of new media has reproduced the discursive practices that directed the idea of progress/innovation and the critiques of the post-digital. Although there are historical and technological connections between the concepts, post-digital aesthetics and culture differ from new media studies in

terms of the values they centralize, their affective outcomes, and their ideological positioning. According to Cramer (2015), new media, which expresses a different conceptual plane rather than a historical period, has been a problematic definition that has included the assumption of a break from the beginning. While the tense relationship between the terms 'new' and 'old' which must be evaluated within a broad cultural framework, remains on the sidelines, he states that the focus has shifted to the critical framework of the post-digital. According to him, new media implies a 'posteriority' that is open to criticism due to its ideological approach that equates technological innovation with cultural progress. Nevertheless, while the concept of post-digital is problematized, new media, which can be read as one of the consequences of Hegel's rationally oriented historical narrative, has been subject to rather limited critical response, creating a situation of irony.

Despite its initial negative connotations and the criticism directed at, the post-digital holds significant potential that offers a value-oriented conceptual framework which counters the emphasis on constant innovation and development in technology (White, 2009; Cramer & Jandric, 2021). Rather than entirely rejecting digital technology, the concept seeks to consider the political, cultural, economic, and structures of both the old and the new media within recently configured layers of meaning, an approach that has been embraced as an opportunity by various disciplines and creative practices. In this sense, Sinclair and Hayes describe post-digital as "a space for learning, struggle, and hope" (2019, p.120). Similarly, Kulle, Lund, Schmidt, and Ziegenhagen argue on their online publishing platform which is based on their theoretical and practical explorations of thinking beyond the digital, that the concept, which is sometimes fiercely criticized, can be quite useful in conducting a multifaceted analysis of ideas related to the field (Post-Digital Culture, n.d.). Davies (2011) also points to the concept's potential to encourage us to think about constructing new meaning and society in our current world, setting aside our focus on technology itself. Our value systems, largely based on the reflex to achieve the best and the cutting edge, result in the glorification of technological innovation, just as it happens in digitalization. As long as we remain fixated on improving the hardware of digital systems and infrastructures, the deification of new technologies and a departure from critical thinking become inevitable. However, post-digital is not a post-technology phase that has failed to go beyond considering digital a rev-

olution. In this context, Taffel (2015) includes avoiding this "culture of upgrading" within the boundaries of his definition in his inquiry into the meaning expressed by post-digital.

When we take the digital for granted, we stop applauding these transformations, which are seen as a kind of victory, and ask: "What will we do when all these are no longer special or interesting? What will we build then?" (Davies, 2011). This emphasis on "meaning" within a more cyclical process involving returns and repetitions, as opposed to innovation and result-orientedness, forms the core of post-digital culture. The question that gains importance is not the nature of the technological progress we extol, but how we will live within these digital connections. Such an inquiry, extending to the intersection of technological developments and the institutions, values, and systems of social life, naturally carries a political dimension. As Jandric and Mclaren put it, "The post-digital condition is not about technology; it says that technology creates our reality" (2021, p. 632). In parallel, it is seen that the debates that initially formed the agenda of post-digital theory were limited to the normalization and trivialization of technology. However, in the recent period that followed, the perspective broadened with studies that went beyond practical results and also critically examined the political dimension of the issue. Thus, although based on technical and cultural transformations, it has reached a broad scale that permeates all kinds of sociological building blocks. In this sense, in post-digital theory, it is not possible for a technology to have an objective identity or for the digital to remain at a limited level, merely as an environment and opportunity. Its effort to disregard the differences between certain established dualities, such as human-machine, virtual-real, nature-culture, and new-old, which are assumed to have a conflictual relationship, also stems from the same technology-society interaction-focused view (Petricini, 2025). When a similar opposition is established between digital and analog, traces of a new aesthetic in art were first pursued, it is followed by critical media studies and ideas emerging in the field of education, leading to the first steps of a systematic theory (Cascone, 2000; Fleischer, 2013; Pepperell & Punt, 2000).

Post-Digital Imperfection Aesthetics

Cascone (2000), who introduced the term "post-digital" into the literature, firstly proposed the concept to describe a deconstructive aesthetic that eliminates conventional methods in music. He associated this term with Negroponte's (1998) emphasis on the end of the revolutionary period of digital technology and used it to describe the characteristics of electronic music in

the 2000s. This character is formed by the processing of sound using digital algorithms; experimental techniques that use micro-sounds, electromagnetic signals, clicks, distortions, and cuts. The aim is to transform error and imperfection into an aesthetic means of expression rather than striving for a perfect or flawless sound technique. In another early work, "Post-digital Aesthetics and Return to Modernism" Ian Andrews (2000), states that digital music, which set out with its pursuit of a 'cleaner' sound transmission and perfection, eventually began to seek the 'genuine warmth' of analog. This contradictory situation, which initially involved a search for a kind of analog similarity within the traditional, has led to the preference for 'transparency' in post-digital aesthetics. Thus electronic digital music has paradoxically developed an analog aesthetic.. Another early use of the term was the 'membrane' metaphor introduced by Pepperell and Punt (2000) in their work *The Postdigital Membrane: Imagination, Technology and Desire*. The authors used this metaphor, which expresses unity and separation as another contextual abstraction within the same environment, to attempt to draw a conceptual framework for scientific, philosophical, artistic fields. Thus, it has been emphasized that we need more adaptable conceptual maps that prevent determinism in the face of dualities frequently discussed in the context of post-digital theory and that can convey the spirit of the age.

First introduced within a limited framework in the early 2000s, the approach gained popularity in disciplines such as art and design, many years later. It is particularly evident that the term began to be addressed with academic interest after 2010. At this point, Gere draws attention to McLuhan's statement that "Art always functions as an early warning system that tells us what is beginning in the old culture" (2008, p.116), emphasizing the role of art as a harbinger in our inquiries into the direction society may take in the future and the technological or cultural transformations it may undergo. It is also evident that artists were among the first to engage in discussions on digital network media. They played a pioneering role in making the conditions and consequences of digital disruption visible, as well as the limits and fragilities of this media phenomenon, thereby laying the groundwork for subsequent theoretical approaches (Kuni, 2015).

Some examples from the post-2000 period, when interest in the concept of post-digital increased, including Fleischer's "Post-Digital Manifesto" (2013) and Susan Hayward's (2013) significant work that addresses post-digital cinema, *Cinema Studies: The Key Concepts*. Another significant contribution is

Alessandro Ludovico's (2012) Post-Digital Print: The Mutation of Publishing Since 1894, which examines the transition from print to digital publishing as both an innovation and a point of intersection (Kulle et al., n.d.). As Ludovico (2019) points out, the role of conflict between two different generations of media manifests itself in a form of hybridity. He describes this somewhat paradoxical situation using the metaphor of symbiosis, emphasizing that the new media does not always have to destroy the old one. This hybridity of old and new media erases the boundaries between them or, at the very least, allows them to be consumed together. This media and artistic consumption form discussed by Cramer (2015), using Spotify does not prevent someone from listening to music on a turntable, or manipulating their photos with digital editing tools that does not prevent them from creating a charcoal drawing. Because there is no requirement to consume one over the other here; rather than choosing a technological tool, it is a matter of selecting the aesthetic qualities these tools offer. Therefore, in the post-digital perspective, we see a ground where the individual embraces this intertwined nature without regard to whether a medium is analog or digital.

On the other hand, this intertwining, not abandoning the analog, should not be perceived simply as romanticism for the past (Berry & Dieter, 2015). Digital technologies have led to the phenomenon of superficial consumption and constant scrolling, in addition to the aforementioned culture of 'upgrading.' However, rather than being swept up by the speed of technology, demonstrating a concrete and tangible presence in post-digital aesthetics, which gives meaning to experience, is not considered a limitation or deficiency. Analog is not flawed or deficient simply because it lacks certain conveniences associated with digital technologies. On the contrary, this has turned into a source of richness and value rather than a limitation (Fleischer, 2013). Post-digital thinking involves a conscious embrace of older tools and those considered outdated, rather than a perspective that constantly seeks what is newer and better. Taffel (2015) states that it is quite possible to establish a connection between this perspective and media archaeology, which offers a cyclical and pluralistic historical perspective. In this approach, which addresses the simultaneous historicity of media tools, the current uses of forgotten tools are examined in a way that rejects cumulativeness.

This hybridity among media technologies is not solely related to the elimination of technical differentiation. Numerous examples from cultural and artistic history demonstrate that media have become obsolete and relegated to a secondary position do not disappear entirely. For example, in cinema,

which is technically mediated and directly dependent on technology, there is still active engagement with analog film culture. These technologies, which also share an ongoing historical transformation, shape our intellectual tradition as a whole; they also influence how we perceive reality, how we represent it, and how we transform it with our imagination (Kuni, 2015). Although not a new discovery in art, the effects of this trend are also seen in the "New Aesthetic" approach, which gained popularity with James Bridle (as cited in Berry & Dieter, 2015). Just as Denson and Leyda (2016) consider the transformation related to the post-cinematic era to be a process intertwined not only with technology but also as a process intertwined with perception, emotions, subjectivity, and social relations. Similarly, the convergence of the digital with material forms transforms both the relationship we establish with objects and the way the subject is represented.

After Yang (Kogonada, 2021): An Analysis In The Context of Post-Digital Culture

Post-digital culture, in which technology has become an ordinary part of everyday life and non-human entities such as androids, digital, and virtual beings are integrated into lived experience, becomes distinctly visible in After Yang. In this context, the film reveals how culture is shaped not under technological determinism, but through a relationship of coexistence and harmony with it. Analyzing the post-digital cultural traces present in the film is crucial for understanding how this relationship is established and how it manifests in everyday life.

The Ordinariness of Technology

The narrative structure commonly associated with the science fiction genre is often based on dystopian projections of the present or the future. In these narratives, technology is indeed part of everyday life, however, rather than functioning as a normalized background element, it is positioned at the center as a force that determines and governs life itself. Technological systems are frequently presented as structures that dominate human existence and produce destructive consequences. For this reason, the strong presence of technology in science fiction cinema is rarely represented as an affirmative figure; instead, it is framed as a domain of threat that demands caution. The fundamental conflict of such narratives largely emerges from the point that technology has reached. Depictions of technological progress as irreversibly transforming humanity—at times leading it toward extinction—alongside post-apocalyptic worlds, isolated individuals, and environments saturated by technology, constitute some of the genre's dominant representations.

In *After Yang*, technology does not appear as a force positioned above or beyond the human, nor as a central determinant that governs human life. The film does not focus on radical or disruptive transformations of human existence, nor does it revolve around questions of what technology does to humans, what it takes away from them, or what kinds of losses it produces. Instead, the narrative foregrounds life itself and the relational networks formed within it. The film seeks to render visible not only what is lived, but also how these lived experiences are constituted. This perspective also prevents the narrative from being framed solely as a "human story." Even technologically produced beings—such as artificial, android, or techno-identities—are approached within the same relational framework. All practices of everyday life that belong to the present moment and to the immediacy of the here and now are presented as natural components of life itself. The presence of technology does not disrupt this sense of naturalness; on the contrary, by remaining within its boundaries, technology becomes an integral part of the ordinary flow of life.

The film's approach to technology deliberately avoids placing it in a privileged or sacralized position. Within the narrative, technology is presented neither as a threat to be feared nor as a figure of progress to be celebrated. Techno-entities that emerge through technological development are no exception to this perspective. Although these entities come into being through technology, they are not addressed through a discourse of superiority or glorification. Rather, the narrative foregrounds the perspective of a human subject who does not marvel at technology but seeks to live with it and to understand it. For this reason, technology in the film world is situated within ordinary life, as a quiet and natural element.

This perspective on technology distances the film from chaos and places calmness, together with ordinariness, at its center. This does not mean that conflict is entirely absent from the film. On the contrary, various problems and unresolved issues emerge throughout the narrative; however, these are addressed within a framework oriented toward understanding and relational engagement rather than toward the production of crisis. For this reason, characters that emerge through technology, although they may embody a certain degree of unknowability, do not become figures that evoke fear or chaos. They are positioned not as threats, but as beings that call for understanding and comprehension. It is precisely at this point that the film articulates a conception of technology that is immanent to life and grounded in lived experience. In matters concerning life, technology does not emerge as

an explanatory or causal agent to which responsibility is attributed; the existing problems belong directly to life itself. Accordingly, what is questioned for both humans and techno-entities is not where life is heading or what has caused it to arrive there, but the shared concerns that belong to all those who exist within life. In other words, both inquiry and conflict in the film are oriented directly toward life itself.

Although the story unfolds within a society in which advanced technology exists, this society is not represented as a techno-society in a direct or explicit manner. For this reason, the temporal setting of the narrative does not become clearly defined. While the level of technology depicted in the film exceeds that of the present day, the effect it generates does not point toward a future-oriented imagination. Among the primary reasons for this are the narrative's avoidance of a chaotic structure, its spatial choices, and the fact that conflicts are not attributed to technology as a singular causal factor. In addition, the strong presence of traditional everyday practices within the narrative world further reinforces this perception. Techno-entities and clones are embedded within life itself; they exist among families, on the street, and in restaurants. These entities are not presented as sources of fear or threat; in many instances, their specific ontological characteristics are not even explicitly articulated. The institutions that accompany their existence—such as warranty services and repair shops—also form part of this ordinariness. The institutions encountered in the film carry both traditional and technological qualities. For example, following Yang's malfunction, the act of taking him to a repair technician is presented as an ordinary, everyday practice. At the same time, references to warranty procedures and software serve to recall the technological dimension of the narrative. This reminder, however, does not draw the story into a technology-centered axis; rather, it renders technology and everyday life equally visible. The father's description of Yang's malfunction as simply "he shut down and did not turn back on" demonstrates how this relationality is articulated through a language that is at once every day and technical. Similarly, video calls and the circulation of data related to families indicate that life is also technologically organized. Nevertheless, these elements do not become dominant or occupy the narrative center. The film does not construct an account that attributes blame to technology or frames it as a burden imposed upon humanity. Instead, technology is woven into the texture of the story, while the narrative deliberately distances itself from a crisis-driven framework. To this extent even navigating the memory of a techno-entities and forming an affective bond with

it is presented as an extension of post-digital culture. Ordinariness thus emerges as the fundamental ground upon which all the film's dynamics rest and which the narrative continuously emphasizes.

The Non-Oppositional Organization of Space

In science fiction cinema, space is often constructed as a carrier of utopian or dystopian visions of the future. Studies conducted within this framework demonstrate that architectural representations in science fiction films are shaped around specific narrative tendencies. Indeed, a study encompassing more than 150 feature-length films indicates that these representations are classified under four main categories: Technological Future of Earth (utopia/dystopia), Post-Apocalyptic Earth, Alternate Reality (past or present day), and Other Worlds (alien worlds/virtual reality) (Căplescu, 2015). Another study examining cinematic architecture in the science fiction genre suggests that science fiction cinema functions as an alarm system, revealing the consequences of the rapid rise of technology and capitalism. It is anticipated that the buildings of the future will possess more complex systems, forms, and spatial organizations. These spaces are equipped with technological elements such as ramped structures, suspended systems, bridges, and sustainable materials (Al-Haj et al., 2022). Despite its positioning within the science fiction genre, After Yang deliberately distances itself from narratives of technological chaos and instead focuses on the flow of everyday life, rendering space an element worthy of analysis. The film does not construct a future-oriented dystopian temporal framework commonly encountered in science fiction narratives; rather, the story unfolds precisely in the "now." This situation anchors the temporal flow of the narrative in everyday time while allowing space to be constructed as a natural extension of this temporality without losing its sense of ordinariness.

The story, which appears as a slice of life itself, foregrounds everyday experience while deliberately distancing itself from the pessimism often produced by space. This does not mean that the narrative constructs a utopian space. Rather, in a manner consistent with post-digital culture, the flow of life, technology, and the spaces in which life unfolds coexist without being rendered extraordinary or excessively normalized. In this way, the potential for space to evolve into a dystopia is deferred, and the fluidity of the narrative is preserved. One of the film's most prominent spaces is undoubtedly the home. This space, in which the family lives together and shares life, is also established as a shared living environment for the techno-character Yang. Human and techno-entities inhabit common spaces; no spatial or existential

separation is constructed between them. They spend time together and share domestic life. In this sense, the film aestheticizes contemporary space as an intimate environment and renders this intimacy visible through the atmosphere of the home.

The home, which emerges as a significant space in the film, is positioned not merely as the place where the family lives, but as a space defined by warmth and a sense of belonging. It is far removed from cold metallic surfaces and an atmosphere evocative of individualism; on the contrary, it conveys a warm and intimate quality. The soft lighting and muted color palette preferred in the illumination of the domestic space play a decisive role in establishing this sense of intimacy. The other spaces depicted in the film, including the home, are neither dystopian nor futuristic. The sense of "ordinariness" that lies at the center of the film also encompasses space. The presence of technology within life is not presented as an element that transforms or dominates space. The film avoids cityscapes filled with skyscrapers; cities are kept away from neon colors that symbolize technology or from dark, post-apocalyptic tones. Moreover, the spatial configuration is closely intertwined with nature.

This approach aligns with perspectives that draw attention to the frequent exclusion of nature in dystopian future representations and emphasize that spatial credibility is strengthened—regardless of scale—by incorporating even the smallest elements of the natural environment into design. Similarly, the argument that spatial configurations drawing on historical styles and blending multiple temporal references offer a more believable world for the viewer, as opposed to the frozen atmosphere produced by uniform, sterile, and homogenized future designs, resonates with the film's spatial aesthetics (Căplescu, 2015). In the film, nature does not signify a domain that has vanished under technologically dominated life, nor does it depict an urban space devastated by technological excess. Rather than generating meaning through spatial oppositions, the film avoids constructing binaries and instead situates space within the framework of post-digital culture. This approach is also clearly reflected in the architecture of the family home. The interior combines elements of tradition and modernity, while the dominance of green, orange, and brown tones contributes to a calm and subtly mystical atmosphere.

The narrative extends beyond the domestic space to include public settings such as restaurants and museums. Within this framework, the human subject is positioned not as one who is confined within space or alienated from it, but as a being that maintains an ordinary and unstrained relationship with its surroundings. The characters do not move through gloomy or enclosing environments; rather, they continue to exist in open spaces and in direct contact with nature. Indeed, following Yang's malfunction, the father walks through the forest, reflecting on Yang during this walk. Although the focus of thought is techno-entities, the body is situated within nature. This clearly demonstrates that the film does not represent human life as detached from the natural environment. A similar spatial relation is consistently sustained across all settings in which the narrative unfolds.

The spatial configuration demonstrates that a system operating through oppositions is excluded from the film. Indeed, the overall narrative also refrains from constructing a conflict driven by binary oppositions, and this approach is consistently sustained in the design of space. For this reason, although heterogeneous elements coexist, they are not arranged to generate contrasts. Space functions as the site that enables the coexistence of these elements. Different settings such as the home, restaurant, museum, or natural environment are not excessively coded with singular and fixed meanings; no space is foregrounded as explicitly futuristic or as a technological showcase. Spaces are represented neither as threatening nor as idealized domains. In a manner consistent with post-digital culture, space neither renders the domination of technology visible nor produces a meaning that romanticizes nature in opposition to such domination. This non-oppositional spatial order supports the film's calm narrative structure. Such a spatial approach can be considered in relation to the notions of permeability and hybridity that come to the fore in post digital culture. Within the narrative, no element is aestheticized and elevated, nor is any other positioned as subordinate. Space is configured not as a showcase that amplifies the visibility of technology, but as a ground in which traditional everyday life continues. However, this sense of traditionality does not imply a structure in which technology is excluded or relegated to the background. On the contrary, the film establishes a zone of synthesis in which advanced technological actions can exist in an ordinary manner within a non-techno-centric domestic space. Within the home environment where family life unfolds, video calls can be made, data can be transferred, and advanced technological practices—such as the opening of a memory space through access to Yang's memory core—are integrated into

the narrative without disrupting the naturalness of the space. Family members who move within Yang's memory enter the streets of memory within this synthetic structure. In this process, a new space is revealed; however, rather than producing an entirely new meaning of space, this emergence renders visible the relationality between the human and the techno-entities. Thus, space becomes a hybrid structure simultaneously open to both analog and digital practices. Technological actions are presented not as elements that transform or estrange the subject from space, but as practices that become normalized by being articulated into the everyday uses of space. In this respect, the film offers a permeable spatial experience characteristic of post digital culture, in which technology can become ordinary within traditional spaces.

Relational Subjectivity Between Humans and Cultural Techno-Entities

In science fiction cinema, techno-entities are most often constructed through conflict, threat, or forms of post-human cognitive superiority. Indeed, a study examining representations of fictional robots in popular science fiction films—covering 134 films and 108 unique robot figures—demonstrates that these entities are largely designed with cognitive capacities at or beyond the human level, and that robot figures endowed with self-awareness are more frequently preferred due to their potential for narrative development and conflict generation (Saffari et al., 2021). Contrary to this general tendency, techno-entities in the film are positioned not as sources of conflict but as integral components of everyday life and relational continuity. Non-human entities coexist as natural parts of society, without generating threat or tension. The fact that these beings are products of technological processes or human manufacture is not explicitly foregrounded; technology does not function as a dominant determinant but rather stands as a natural component of life itself. Rather than positioning technology as the primary organizing force, the film grants primacy to social relations. For this reason, non-human entities are not defined solely as "techno"; a cultural dimension is added to them, making it possible to describe them as "cultural techno-entities." This designation, however, does not imply that techno-entities lack individual or singular significance. The film reveals this dynamic most clearly following Yang's death. The question of where Yang can be considered "humanoid" and where he emerges as an autonomous being is presented in an intentionally ambiguous manner. This question does not arise from conflict or an identity crisis; rather, it articulates the human search for meaning in relation to the techno-entity. Thus, although the film initially

progresses through non-human entities, it ultimately redirects the inquiry toward the human, constructing these questions through a distinctly human perspective.

One of the primary domains through which the questioning of techno-entities is grounded in the human is articulated through the body. In the film, the body is not presented as a virtual or wholly digital existence; rather, it gains meaning through its physical presence and its resemblance to the human. This condition applies not only to Yang but also to the cloned beings that appear in the narrative. Bodily existence enables these techno-entities to take part in society, to be accepted as members of a family, and to establish direct bonds with humans. In this sense, the body becomes one of the fundamental elements through which relationality and a sense of belonging are formed. The film's approach to the body becomes particularly visible following Yang's death. Yang's shutdown and failure to restart signify not merely a technical malfunction but the loss of bodily function. The family's efforts to resolve this situation place Yang's body at the center of the process; the problem is not treated as an issue that can be addressed remotely or solely through software-based interventions. Yang's body is one that is carried, protected, and shared in coexistence. This approach removes Yang from the status of a purely digital system or functional device and situates him as a techno-entity whose meaning emerges through bodily presence. As Merleau-Ponty emphasizes, the body is not a passive object situated in the world, but the fundamental condition of existence that enables the subject to relate to the world and to produce meaning. The body is the only means through which the world can be perceived and inhabited (Merleau-Ponty, 1968). In this context, Yang's bodily presence functions as an active mode through which he becomes part of the world and participates in the production of meaning.

Yang's inability to be reactivated clearly corresponds to the phenomenon of death within the narrative. Death initially becomes visible through the body. Accordingly, in the film death is not experienced on an abstract or symbolic level, but through the cessation of bodily functioning. This condition also shapes the ways in which the characters confront death. The deterioration of the body effectively brings Yang's existence to an end, while simultaneously becoming the primary element that concretizes his absence within the domestic space. In this sense, mourning emerges as a direct consequence of the cessation of bodily functioning. The body is positioned as a determining

factor that both terminates Yang's existence and initiates the family's process of grief. This cessation of bodily functioning also gives rise to a process of decision-making. Technically, Yang's body is recyclable; however, this option requires a rapid and rational decision. Otherwise, the knowledge that the body will decay is incorporated into the narrative as a technological reality. Although the fact that the body is covered by warranty or subject to recycling procedures renders the technological dimension of the issue visible, the memories inscribed in the body necessitate an emotionally driven decision-making process rooted in lived experience. This is because, as a cultural techno-entity, Yang is more than an automated helper or a functional assistant. This condition is already perceptible in the form of the relationship the family establishes with Yang from the very beginning of the film. Access to Yang's memory after his death further distances him from the status of a mere object of use and brings him closer to being conceived as a being "for himself." This opening creates a zone of indeterminacy for the human characters, while simultaneously redefining the limits and possibilities of the relationship that can be established with a techno-entity. Following Yang's death, both confrontation and farewell unfold through the body. The irreversibility of the body signifies the finality of bodily life. Although Yang is a technological product, he cannot continue his existence within a virtual or digital continuity. At this point, corporeality becomes a valid criterion for techno-entities as well, aligning them with humans on a certain plane. However, this resemblance does not aim to reduce Yang to the human or to position him within a human-centered hierarchy. Rather, within the context of post-digital culture, the film approaches techno-entities as a synthesis, neither elevating them above humans nor subordinating them to humanity. Instead, it allows techno-entities to be conceived as a distinct mode of existence in their own right.

Science fiction cinema tends to portray fictional robots not as static and singular entities, but as structures capable of transformation, adaptation, and functional redefinition. In science fiction narratives such as Terminator, Transformers, or Cloud Atlas, both fictional robots and the spaces they inhabit are constructed as fluid, adaptable, and multifunctional formations that can transform not only their appearance but also their function, rather than remaining fixed or stable forms (Troiano et al., 2016). In addition, it is often emphasized that the postmodern cyborg finds itself in a dilemma closely resembling that of "real" humans, as the blurring of boundaries between machine and human, as well as between the natural and the artificial,

generates a tension of identity. This condition of in-betweenness, highlighted by Smelik (2010), points to a zone of uncertainty that emerges through the dissolution of binary oppositions. The film's positioning of techno-entities as neither entirely machine nor directly human aligns with this theoretical framework. However, rather than constructing this ambiguity as a site of crisis or conflict, the narrative approaches techno-entities as a distinctive, synthesized mode of existence in their own right. This approach becomes tangible through the deliberate marginalization of narratives centered on pure digitality and virtuality produced by technology. Experiences such as confrontation, pain, and mourning are depicted as being lived entirely through the body; they are presented not as mental or abstract processes, but as embodied experiences with tangible corporeal counterparts. At the same time, narrative elements such as access to Yang's mind or movement through memory chambers render the technological dimension visible; yet this visibility does not establish a hierarchical relationship that privileges the digital. On the contrary, rather than positioning the technological and the bodily in opposition, the film brings them together within the same narrative plane. In this way, concepts such as the digital, the virtual, or the copy are rethought through their articulation with conventional narrative forms, and the relationship between the human and the techno-entity is constructed not through opposition, but through continuity and the idea of coexistence.

Remembering thus becomes an inseparable component of the mourning process. However, rather than grounding remembrance in traces retained within human memory, the film delineates an unconventional trajectory by choosing to enter Yang's own mind. This approach renders different dimensions of mourning visible. Mourning becomes intertwined with options such as recycling, recovery, or exhibition. Although these options point to technical and procedural possibilities, the final decision is not made on a technical basis but within an emotional register. This emotional dimension is directly connected to the respect felt toward Yang. At this point, although the entity that has ceased to exist is technically a product, Yang's presentation as a synthesized being makes it impossible to treat decisions concerning him as purely technical choices. Yang has existed; respect for this existence causes options such as recycling or exhibition to exceed their technical framework and acquire an ethical and relational dimension. In this way, a genuine relationship is established within the film. Yang is not exhibited; instead, his family is allowed to access his memories and to move through

them. While this situation may initially appear to pose an ethical problem, it acquires functional significance insofar as witnessing these memories enables a deeper understanding of Yang. Yang's memory is not presented as a collection of data, but as lived experience. This memory constitutes a life experience encompassing his questions, the relationships he formed, and the emotions he experienced. The fact that access to memory is enabled through a serial number and a PIN, the selection of a memory bubble, and the pressing of a "play" button initially frame memory as a gamified experience. However, this gamification is quickly withdrawn and gives way to relationality and emotional proximity. In doing so, the film reconstructs memory not as a technical interface, but as a living experience that becomes an integral part of mourning and remembrance.

Similarly, discourses surrounding the warranty coverage of Yang's existence, considerations of repurchase, repair, or recycling, as well as the fact that the malfunction originates at the core and that a substantial material cost has been paid for him, underscore that he is, first and foremost, a technologically produced entity. Nevertheless, as the narrative progresses, Yang gradually moves away from being a purely technical object and becomes a respected and autonomous existence, recognized as a subject whose meaning emerges through relationships with humans. The fact that Yang is not merely a digital tool, but possesses a bodily presence, also makes his emotional acceptance possible. This acceptance significantly shapes the decisions made about him. Accordingly, while the film includes the statement "Yang has been wonderful. and we'll miss him terribly," the immediately following remark, "but we've been over-reliant on him," reveals that this emotional closeness is framed within a problematic duality. Images contained within Yang's memory belong to nature, the home, and everyday life: trees, a spider's web, Mika's childhood, hanging laundry, a frog, a rainbow, reflections. There are no grand secrets of life, resolved problems, or pieces of information that would redirect the course of the narrative. Yang exists within the small and ordinary moments of daily life. It is precisely this ordinariness that strengthens Yang's condition as a "being-for-himself." In this way, Yang's memory ceases to function as data and continues as lived experience. At this point, the film foregrounds a fundamental question: how should a being that inhabits everyday life, constructs memory through experience, and engages in questioning and observation be understood? Within post-digital culture, memory neither renders a being purely human nor reduces it to the technological. Rather, through the capacity to generate experience and establish

relationships, it situates the being in a distinct, intermediary ontological position.

The Reconfiguration of The Biological Family Narrative

A further key dimension of the film is its configuration of the family. This configuration, much like the other structures within the narrative, carries a hybrid and synthetic quality. The family, to which societies attribute considerable importance, is positioned as one of the fundamental dynamics of human life. The initial steps in perceiving the world, recognizing one's surroundings, and learning are most often taken within the familial sphere. Precisely at this point, the film departs from defining the family solely through biological ties and instead reconstructs it on the basis of emotional relationality. It does not rely uncritically on established roles such as mother, father, and sibling, but rather presents a more plural and flexible structure. Nevertheless, it does not diminish the significance or presence of the family; on the contrary, it renders it visible in an alternative form.

The family, which occupies a central position in the film's narrative, consists of a four-member structure that includes Yang. Yang's status as a techno-entity does not constitute an obstacle to his being perceived as an individual within the family. A white father, a Black mother, an adopted Chinese daughter, and the technologically produced Yang together form this familial unit. This structure signals not only ethnic diversity but also an inclusive togetherness in which a technologically generated being can be incorporated into that diversity. The family's young daughter, Mika, is Chinese and adopted. Yang is integrated into the family with the purpose of acting as an older brother to Mika; he is positioned as a significant figure who guides her, teaches her, and, in particular, transmits cultural knowledge related to her Chinese identity. This transmission makes visible a conscious effort to ensure that Mika's connection to her origins is not severed but instead kept alive. At this point, the film presents a family structure that values not the erasure of the adopted child's origins but their remembrance and continuation. In this sense, the family functions as an inclusive representation of social diversity. The absence of biological ties among the members of this ethnically diverse structure is not portrayed as a weakening factor; rather, the family is presented as a sphere in which love and attachment are grounded in relationality rather than biological affiliation. Within the film, this diversity does not generate crisis or conflict; on the contrary, it is depicted as an ordinary and accepted form of life. The hybrid, harmonious, and mutually

restructuring characteristic of post-digital culture becomes most clearly visible through the representation of familial relations.

Yang's presence within the family serves as a significant indicator that the film departs from conventional representations of the family. The mother, father, and daughter—who belong to the human species, come from different ethnic backgrounds, and share no biological bond—are positioned alongside Yang, who, although non-human and describable as a cultural techno-entity, is nevertheless constituted as a member of the family. This configuration functions as an important representation that strengthens the film's cultural texture and semantic depth, while consistently rendering its perspective visible. In the film, the family is not presented as a structure that necessitates shared origin, biological ties, or even belonging to the same species. Yang appears in family photographs alongside them, participates in the family dance, and becomes a natural part of everyday conversations. Thus, the family is rearticulated not through biological or species-based similarity, but as a form of togetherness defined by cohabitation, sharing, and relationality.

Alongside these considerations, another significant point to be examined is the persistent indeterminacy surrounding Yang throughout the narrative and the gradual deepening of understanding that unfolds as the story progresses. Yang is a purchased technological entity covered by warranty. This condition positions him within the family according to a specific purpose. The primary rationale for his acquisition is to accompany Mika, to establish a relationship with her, and to alleviate her sense of loneliness. In this respect, although Yang is part of the family's daily life, he is initially represented in a more functional and externally determined role. Nevertheless, his designation as Mika's "older brother" signals the value attributed to him and the emotional bond established. The true depth of reflection regarding Yang emerges after his death. As the family encounters the details preserved in his memory, his previously elusive and difficult-to-define position becomes further deepened. This deepening does not distance Yang from the family; on the contrary, it brings him closer to the family. The process shaped around expressions of missing him and having become overly attached to him generates a sense of contradiction and emotional ambivalence for the family; they struggle to fully articulate what they feel. Yet there is a clear exception to this condition: Mika. Even before accessing Yang's memories, Mika had already formed a profound bond with him, intuitively carrying this

attachment. The framing of their relationship as one of siblinghood constitutes one of the strongest grounds for this bond. Unlike the other family members, Mika's relationship with Yang exceeds the conceptual framework through which he is otherwise understood. For the child, Yang is not a technological product or merely a functional assistant; she has never perceived him in such terms. Here, grief does not require explanation or justification.

The mosaic structure presented in the film signifies the dissolution of the prescribed attitudes and inherited codes through which society traditionally defines the family. Familial bonds gain strength not from belonging to a fixed origin or essence, but from the quality of the relationships that are established. The synchronized dance scene points precisely to this harmony. Moving together, maintaining rhythm, and acting in simultaneity render harmony and happiness visible within a single melody. Yet the fact that the dance relies on a measurable order introduces a duality into the scene. Synchronization, while representing relational harmony on the one hand, simultaneously reveals that this harmony can be quantified and reduced to data on the other. Characteristic of post-digital culture, this structure allows family dynamics to emerge through deep and affective relational ties, while at the same time not excluding the possibility that these relationships may be scored and compared. Rather than explicitly questioning this condition, the film normalizes it. In post-digital culture, the emotional and the measurable, the relational and the technical, do not necessarily diverge; instead, they intertwine and coexist.

The depth-oriented and diversity-affirming structure of the relationships among the family members is articulated most powerfully through the metaphor of tree grafting. With the statement that this branch comes from another tree but is now part of this tree, entrenched assumptions about the "real family" are displaced and no given code is reaffirmed. Instead, the film foregrounds a conception of family grounded not in biological origin but in the essence of the relational network that is formed. Although the question posed to Mika by her classmates—who her "real family" is—lingers in her mind, it does not evolve into a site of crisis. This relational configuration of the family finds a meaningful theoretical grounding within Braidotti's framework. From this perspective, the subject is not understood as a fixed, closed structure reducible to origin; rather, it is conceived as a mode of existence that is continuously reconstituted through bonds and relations. As emphasized in updated interpretations of Spinozist thought, the subject is not an atomized and isolated unit but possesses an immanent, relational, and plural

mode of existence shaped within a network of embodied, situated, and contextual relations. This approach defines the subject not by anchoring it to a singular center, but through the micro-level relations and encounters that constitute it, thereby enabling the family to be understood not as a biological essence but as a dynamic formation produced through lived experience and practices of attachment (Braidotti, 2016).

On the other hand, the articulation of the question "Who is your real family?" directed at Mika signals the persistence of normative family codes structured around traditional and biological assumptions. The film does not claim the disappearance of historically dominant family forms; rather, it foregrounds the simultaneous coexistence of multiple familial configurations. This perspective aligns with the relational and inclusive logic of the post digital condition, in which heterogeneous structures operate alongside one another without hierarchical stabilization.

The film refrains from engaging in a comparative hierarchy framed by the question of which family form is "more real." Instead, it reconceptualizes family as a sustained relational practice grounded in affective depth and continuity. Within this framework, the relationship between Mika and Yang emerges on analogous terms. Mika herself is not integrated into the family through biological ties; her belonging is constituted through relational intensity and lived attachment. Yang, although representing a different ontological category as an android, similarly becomes part of the family through prolonged coexistence and shared experience. In this sense, the film relocates the question of "the real" from a biological referent to a relational ontology. Moreover, it departs significantly from dystopian narratives that frame android integration into human life as a threat or rupture. Rather than opposing technological and traditional elements, the film depicts a mode of life in which technology functions as an immanent and ordinary component of domestic existence. Fixed norms give way to carefully cultivated relational networks, which the film renders not as exceptional but as structurally constitutive of contemporary post digital subjectivity.

The Repositioning of The Human

The position of humans is conceived within a decentered structure, shaped by individuals of diverse ethnic backgrounds coming together under a single family unit. In accordance with post-digital culture, no element is positioned as a highlighted or exalted center. This approach becomes particularly evident in the destabilization of the human's conventional central role within

the narrative, most clearly manifested in the relationship between humans and techno-entities. Rather than producing a hierarchy or distinction, this relationship articulates a mode of coexistence. Yang's integration into the family serves as the first and most visible indicator of this coexistence; yet the decisive factor lies in Yang's emergence as an entity that is not solely functional for others. Yang transcends the role of a helper or supporting figure within the family, particularly for Mika. The existence of his own memories, his reflection in mirrors, his observation of his surroundings, and the traces of his engagement with the world all indicate that Yang possesses significance "for himself." These scenes encourage consideration of Yang not merely as a technological adjunct to human life, but as a conscious subject who interrogates existence and participates in daily life at least as fully as humans do. In this respect, the film suspends the traditional narrative structure centered on humans, without subordinating or juxtaposing techno-entities in relation to humans. On the contrary, the horizontal relationality established between humans and techno-entities allows for a rethinking of subjectivity, consciousness, and modes of existence within the framework of post-digital culture.

Conversely, the relationship between humans and cultural techno-entities in the film is not structured around the techno-entity displaying human-like traits or being placed in a position superior to humans. Although the techno-entity exhibits bodily resemblance to humans, it is positioned as a non-human entity. In this configuration, the desire to be human or any inclination toward it is not explicitly emphasized. For this reason, following Yang's death, as the family spends more time in his memory rooms, their understanding of him deepens, raising the question: "Did Yang ever want to be human?" This question extends beyond Yang himself, revealing a perspective directed toward humans as well, as it carries an anthropocentric assumption that places humans hierarchically above others, even if the intention is not explicitly to do so. However, the film's response to this question is clear. Ada's remark, "That's such a human thing to ask, isn't it? You always assume other beings would want to be human." directly challenges this assumption and repositions techno-entities not as deficient beings aspiring to humanity but as non-human forms with their own distinctive existence.

The structure established within the narrative removes humans from being the sole point of reference. Any entity capable of remembering, forming bonds, and mourning is positioned as ethically significant. Consequently, the film does not establish an ontological hierarchy among humans, clones,

techno-entities, or individuals of different ethnic backgrounds; all beings occupy the same plane of existence. Each represents both a shared engagement with life and a mode of existence that is uniquely its own. This equality is not limited to humans alone; entities produced through technology are also incorporated into this relational plane.

This approach aligns with post humanist thought, which argues that the destabilization of anthropocentrism opens up a broader sphere of ethical responsibility encompassing animals, plants, and all non-human entities. Braidotti, in particular, emphasizes that the Humanities should evolve from a nostalgic attachment to traditional humanist models toward a technologically mediated, relational, and "Zoe-centered" system (Braidotti, 2013). In this way, the effects of post-digital culture are strongly felt within the narrative's ethical framework. Humanity is approached not as a privileged standard or norm but as a condition of existence shared with others. At the end of the film, Mika's performance of the song "I Wanna Be" reinforces this perspective on an emotional level, emphasizing that being cannot be reduced to a singular form and that existence can manifest in multiple ways.

Within this form of life, in which humans neither occupy a central role nor serve as the primary reference point, the film presents a non-dystopian narrative of technology. Technological developments are not depicted as forces that disrupt tradition, undermine humans, or impose negative new norms. On the contrary, technology does not generate hierarchies, competitive struggles between species, or inevitable arenas of conflict. The absence of hierarchical oppositions between human and techno, old and new, or natural and artificial allows the narrative to adopt a cultural structure grounded in synthesis and relational coexistence. This approach makes visible a post-digital perspective that frames technology not as a source of crisis but as an integrated component of life, coexisting alongside other forms of being.

Conclusion

Technologically oriented social structures in science fiction are often shaped through narratives constructed around projections of the future. These narratives largely rely on a dystopian framework, with post-apocalyptic worlds, societal collapse, masses of surviving humans, annihilation, and the threat posed by androids to humanity forming the core elements of this framework. However, science fiction is not limited to envisioning the future alone. It also allows for the interweaving of the past and the present, enabling the traditional and the contemporary to coexist within the same social plane. In what

is referred to as post-digital culture, technology is not positioned at the center; rather, it is treated as a component within a network of social relations. Within this framework, neither the technological nor the traditional assumes a dominant or determining hierarchy. Social dynamics resist interpretations based on linear and destructive notions of progress, instead taking shape around the ideas of continuity, co-existence, and mutual interaction. Consequently, in the post-digital conceptualization of society, practices inherited from the past and technological productions coexist side by side within the same cultural sphere.

In this study, which analyzes *After Yang* within the context of post-digital culture, it becomes apparent that the narrative concentrates around specific elements. Foremost among these is the framework that can be described as *the ordinariness of technology*. In the film, technology is not presented as threatening or as a force that dominates human life. It is not positioned as part of a fear-laden futuristic scenario or a domain requiring urgent intervention. Instead, technology appears as a natural component of everyday life, existing in an unremarkable, routine manner. Accordingly, the film does not construct a temporality oriented toward speculative foresight, as is common in classical science fiction narratives. The story unfolds in the present, centering on technology's relationship with contemporary everyday practices.

The spaces in which the narrative unfolds also accompany the ordinariness of everyday life. The story progresses through familiar settings such as the home, garden, restaurant, and cafe. The "*non-oppositional organization of space*" allows everyday moments and emotional continuity to come to the fore rather than generating dramatic conflict. In this way, the construction of a dystopian rupture as a projection of the future is once again unsettled. Although the technology depicted in the film suggests a level beyond the present, the spaces do not produce a detached, sterile, or cold atmosphere. On the contrary, spatial arrangement intertwines natural elements with familiar living environments, demonstrating that the technological and the traditional can coexist within the same plane of life. This intertwinement, as a defining characteristic of post-digital culture, is felt distinctly in both the film's aesthetic and narrative structure.

Another notable aspect of the film is the *relationality between humans and cultural techno-entities*. The presentation of technology as an ordinary and unquestioned component of daily life allows for a seamless integration of

techno-entities into everyday routines. This integration does not imply absolute equality between humans and technos, as certain distinctions and boundaries remain. However, the cultural techno is not positioned merely as a functional tool or service-providing object. Rather, it is situated within the family as an entity that directly participates in familial dynamics and is attributed to emotional significance. The narrative frames the human-technology relationship not through conflict or struggles for superiority, but through coexistence, relational engagement, and meaning-making within everyday practices. In this respect, film positions technology not as an external threat to human life, but as embedded within a network of cultural and emotional relations.

One of the findings that illustrates post-digital cultural elements in the film is the *reconfiguration of the biological family narrative*. A notable aspect of the film is that its emphasis on family is not grounded in blood relations but is instead constructed through relational ties. The family structure, consisting of a Black woman, a white man, and an adopted Chinese girl, clearly exemplifies this approach. What makes this structure even more visible is the inclusion of Yang within the family. In this context, the family is constituted not only through the coexistence of individuals from different ethnic backgrounds but also through the integration of a non-human techno-entity. Although Yang is positioned as a member of the family, the primary reason for his inclusion is Mika. Indeed, Yang was "purchased" to fulfill this purpose within the family. At this point, the film establishes a distinct duality: Yang belongs to the family yet remains one step removed from them. Meanwhile, independent of Yang's presence, the family already presents a structure that is not based on biological ties, composed of diverse ethnic backgrounds, with a child who is not connected through blood. The approach presented by the film is clear: belonging—whether human or non-human—is defined not by similarity, but by relationships that are cultivated through understanding, care, and affection.

In relation to all other elements, the final finding emerging from this study is the *decline of humanity as a privilege*. The integration of techno-entities as active participants in everyday life, the minimization of hierarchical distinctions between humans and techno-entities, and the sense of absence their disappearance evokes in humans all point to this phenomenon. Yet the film's emphasis is not confined to this dimension alone. Yang's positioning as an autonomous being, the possibility of experiencing life from his perspective,

and the presence of his own emotional and cognitive world advance the matter to a more complex level. Yang exists within the flow of everyday life, participating in ordinary moments while simultaneously observing his own presence within them. In this context, whether Yang desires to be human is not a decisive question; indeed, this curiosity belongs fundamentally to humans. Yang's primary inquiry is not directed toward a human desire but rather concerns himself and his own mode of existence.

However, it would be inaccurate to claim that the film entirely excludes humans as a reference point. It is understood that every being defines itself in relation to the existence of another. Accordingly, questions regarding what Yang thinks, how he interprets his own body in scenes where he looks in the mirror, or the meaning he ascribes to that body are deliberately left open; the film does not provide direct answers to these inquiries. At this juncture, a notable tension emerges in the narrative. While considering every entity on an equal plane of subjectivity may at first appear to suspend anthropocentric hierarchies, as Susen (2022) points out, the unlimited extension of the concept of the subject to include cells, machines, and technological entities carries the risk of weakening the concept's analytical power and rendering invisible distinctively human capacities, such as self-awareness and moral reasoning. This, in turn, introduces the danger of a vitalist relativism that complicates a coherent definition of moral agency. Nevertheless, the film neutralizes this tension by undermining the question of whether Yang desired to be human, emphasizing that the inquiry itself is inherently human-centered. In doing so, the film's positions being human not as a goal or privileged status but simply as one form among multiple modes of existence.

Moreover, within the framework of post-digital culture, the film does not construct meaning through distinctions or hierarchies. It avoids producing binaries such as what is "correct" or "better." The narrative challenges established assumptions, including the centrality of humans, the biological basis of the family, and the valorization or devaluation of technology. It also renders linear oppositions, such as before–after or old–new, largely irrelevant. By removing these distinctions from the realm of critique, the film reframes the inquiry toward the question of "how do we exist?" and, in doing so, emphasizes coexistence, relationality, and the practice of living together.

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IMAGINING THE CITY OF THE FUTURE IN THE CONTEXT OF VISUAL TECHNOLOGIES: THE SCREENIFICATION PROCESS OF URBAN SPACE FROM A SOCIO-SPATIAL PERSPECTIVE

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Introduction

Throughout history, cities have been spaces where human life is organized not only on a physical level but also on a socio-cultural level. Shaped by the means of production and technical capabilities of the time, urban spaces have formed human life in a dialectical process. According to Lewis Mumford, a leading figure in the historical and sociological study of cities, the phenomenon of the city originated within the Paleolithic-Neolithic community as a sudden and unprecedented evolution, taking place as a holistic transformation of past settlement areas (2019, p. 42). Mumford, a key figure in the study of urban fabric and structure, known as urban morphology, has addressed the transformation of cities over the course of history, from ancient Greece to the present day, as spaces of economic, political and administrative organization. Another prominent scholar in urban studies is Gordon Childe. Childe (2000) highlighted the critical importance of the city in human life after the Neolithic Revolution through the concept of the "Urban Revolution." He attempted to define the structural characteristics of pre-industrial and industrial cities with the Urban Revolution. In the works of both Mumford and Childe, the structural transformation of the urban space is associated with the modes of production of the time and is discussed together with the transformation of the overall socio-cultural sphere.

At the socio-cultural level, the design of social life based on the sense of sight characterizes the transition from thinking man, "homo sapiens," to seeing man, "homo videns." (Sartori, 2006, pp. 7-9). While the sense of sight precedes words, it is associated with looking as part of an act of selection. People look not at a single object but at the relationship between objects. In this context, seeing emerges as a reciprocal act. The tradition of perspective, which took hold in the West at the beginning of the Renaissance, organized

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everything from the viewer's perspective, but with the invention of the camera, the idea that the viewer is the center of the world has disappeared (Berger, 2003, pp. 8-9, 16-18). Looking at the organization of social life considering the foregoing information, an "ocularcentric" perspective emerges. Based on the sense of sight which has emerged as a product of the social development process in Western societies, social life has taken on various forms throughout history, particularly within urban spaces. In terms of the sense of sight, urban planning has at times emerged as part of systems of power and control, and at other times as a space for communication and sociocultural interaction.

The technological developments of the modern era have led to the circulation of new modes of seeing in society, while also causing a shift in ontological and epistemological terms. According to Jonathan Crary, geometric optics prevailed in the 17th and 18th centuries, while physiological optics became prominent in the 19th century. Optical devices invented in the 19th century enabled the construction of the individual as a calculable and regulatable observer, transforming human sight into something measurable and interchangeable (2010, pp. 29-30). This process forms part of the normalization and naturalization of the seeing man and the observer. With the postmodern period, the city has emerged as a mode of seeing and has become a space of vision. Urban space, foregrounding the movement of the eye, has become a space of encounter and experience (Robins, 1999, p. 209). Consumption-driven lifestyles are becoming globally circulated within the field of visual culture. In this context, cities are also beginning to take shape under new definitions such as the global city, the design city and the spectacle city.

The visual culture we live in today and digital visual technologies have led to the beginning of a new era in the perception of urban space. The daily practices that have become mediatized within socio-cultural life are leading to rapid transformations in both the private and public spheres. In this era, urban topography is experienced not only through the physical environment but also via screens and media interfaces. In the literature on the digitalization of urban space, theorists have discussed the process of the "screenification of urban space" from different dimensions. Scott McQuire's (2008) concept of the "media city," Lev Manovich's (2006) concept of "augmented space" and Mirjam Struppek's (2006) concept of "urban screens" have interpreted this process from their respective perspectives. In this context, this study aims to address the screenification process of urban space from a ho-

listic perspective at the intersection of the relevant literatures and to interpret it from a critical perspective by depicting the city of the future in the development of imaging technologies. Examining the eye-centered perspective in urban planning processes together with the screenification of urban space will contribute to the literature by comprehending it in a dialectical process, beyond being a current phenomenon of the mediatized urban experience we live in today.

The Dominance of The Eye In Urban Morphology In The Historical Process

Urban morphology deals with the physical form and structure of cities and how this structure has changed over time. When studying the morphological characteristics of urban spaces from ancient Greece to the present day, it appears that each period has its own unique characteristics. The ancient Greek city-state, the Polis, emerged as a religious, military, economic and political entity. During that period, the Polis was conceived as an ideal model of social structure. Greek civilization defined the city as a coherent entity with a holistic perspective, characterized by a balanced relationship with the countryside. During that period, the city had a single image, composed of parts with different functions (Benevolo, 2006, p. 8). The ancient Greek Polis is associated with the emergence of public spheres and the idea of democracy from the perspective of political philosophy. In this context, public spaces have become prominent in urban morphology, especially for adult and young male populations, as places where issues related to the city and society are discussed. Although ancient Greece did not systematically plan public spaces within the urban environment as areas for communication and gathering, the visual communication aspect stands out in this spatial experience. This is because, during that period, the city gained visibility as a concrete practice of space through elements such as administration, marketplace and public spaces.

In urban morphology, a design that systematically based itself on the eye was first implemented during the Roman Empire. Emperor Hadrian wanted his power to be seen in monuments and public buildings. Hadrian defined the communicative public sphere in ancient Greece as a space of power and shaped the urban sphere using a technique called "geometry of power." The two architectural forms that emerged as the Peristyle and the Basilica ensured the control of bodily movement within the city. In the Roman Empire, the geometry of power was used to plan not only public space but also residential areas as private spaces (Sennett, 2011, pp. 75-77, 103). The shaping of public and private spaces under the dominance of the eye in the Roman

Empire increased even more with the adoption of Christianity as the empire's official religion. In this period, looking and belief, and looking and obedience constituted an important point in shaping urban morphology. The medieval city did not have a systematic urban plan like it did during the Roman Empire. Research on Western history during this period highlights that urban spaces had a structure known as a "fortress city." Apart from the political and economic structure of the fortress city, it has an extremely intricate physical design in which the distinctions between public and private spaces are blurred (Pirenne, 2011; Benevolo, 2006). In this context, in the medieval city, which was distant from the optical distance required by the eye and the gaze, designs based on the eye and the sense of sight became more visible primarily in garden design. At that time, designs such as the gazebo, the labyrinth and the garden pond were not merely physical landscape designs that placed the sense of sight at the center of urban space, they were also socio-psychological spaces as part of the relationship that people establish with themselves (Sennett, 2011).

The 18th century marks a distinctive period in the shaping of the urban space and the morphological form it will acquire. The Cartesian philosophy and scientific thinking that emerged in Europe in the 17th century marked the beginning of a new era in the perception of social life. Cartesian philosophy, which presents the world through scientific and rational thought, has shaped a conception of society based primarily on mathematics and the natural sciences. Particularly with this period, discoveries in the field of biology enabled the perception and planning of social life along the axis of a structure like a living organism. According to Richard Sennett, 18th-century Enlightenment planners designed urban space as areas where people could move about freely and breathe (2011, p. 229). At that time, when urban morphology was characterized by streets and boulevards that enabled people to move about and walk around the urban space with ease, public spaces had a distinctive place within the urban space. Standing out in the conception of public space with his interactive interpretations of body and space, Richard Sennett emphasized the conversational forms of coffeehouses in 18th-century public life and the democratic participatory culture they fostered (1996, p. 111). In the 18th-century city, streets and avenues as public spaces became meeting places for individuals from different social classes and such spaces were shaped primarily based on the sense of sight. This process, which reflects the shaping of the city based on the perception of

perspective, is the product of an understanding of urban planning dominated by the eye.

The fundamental motif shaping the 19th-century city is the Industrial Revolution. The Industrial Revolution does not only characterize a new era in terms of the means of production and production relations but also indicates a differentiation of social classes and a transformation in the form of governance. While referring to the 19th-century city as the "coal city," Lewis Mumford summarizes the distinguishing features of this period as the sense of insecurity among the working class, the creation of a competitive and open market for the sale of labor and goods, the need to meet the raw material needs of new industries and the retention of overseas colonies to which industrial surplus production could be transferred (2019, pp. 524-528). Following Mumford's arguments, it seems that the Industrial Revolution, which marked the stage of economic modernity, brought about a process of rationalization in social life, not only were the spheres of production and consumption mechanized, but social life itself became mechanically programmed. The modernist idea of planning social life from a centralized perspective is realized by relating to different epistemological domains. Michel Foucault emphasizes that a principle of political governmentality, signifying a rupture from the structure of past societies, began to be implemented in the West from the early 17th century onward (2016, p. 316). As a biopolitical tool, the planning of space in general and urban space in particular emerged in the 19th century as a field of expertise, becoming prominent in the fields of urban planning, cartography and architecture. All these fields of expertise have planned the urban space as a higher Cartesian eye that will reinforce the interests of the ruling class and enable social control. Yves Lacoste, a Marxist geographer, emphasizes the ideological dimension of geography and argues that the physical features and economic, social and political characteristics that constitute the field of geographical research serve as a form of knowledge through which the state controls and organizes the people living within its borders (1998, pp. 15-16).

Emerging in the second half of the 20th century as a period in which individual consumption and cultural forms became increasingly important, the idea of postmodernism is closely related to urban space and morphology. While modernist urban planning attempts to shape space for social purposes, space for postmodernists is areas that will be shaped based on aesthetic goals and principles that extend beyond social purposes. Postmodern

architects and urban designers produce products suitable for different contexts, functions and aesthetic preferences while establishing personalized forms of communication with diverse clients within the consumption-based postmodern cultural sphere (Harvey, 1997, pp. 84-85, 95). In this era, where visibility stands out in the socio-cultural sphere, the boulevards, streets and buildings of cities are shaped by ocular centric perspective. Kevin Robins treats the city as a style of seeing and emphasizes that urban space brings out the movements of the eye. The city, as a space of visual encounter and experience, is closely associated in the postmodern period, particularly in the field of television broadcasting, with reality television programming. The visual style brought about by reality television stands out as part of the post-television experience (1999, pp. 196, 209). Robins is one of the first thinkers to argue that the postmodern city has taken on an imaginal reality. In postmodern culture, urban spaces, which have taken on the form of simulacra, are revisited not only in terms of the authentic cultural forms they have lost and the visual landscape they have acquired, but also in the context of the close relationship they have established with developing communication technologies. In this context, Kevin Robins associates this urban experience with reality shows, which emerged as a prominent form in television broadcasting in the 1980s and thereafter. These shows bring together the urban space and the ocularcentric experience with an experiential space behind the screen as part of indirect forms of communication. In postmodern culture, urban space, which is at times part of an aestheticized visual experience and at other times part of an anesthetizing one, has been shaped under the dominance of the eye.

Urban Landscape and Urban Perception Shaped in the Axis of Visual Culture

In sociological studies, the emphasis placed on temporality has generally disregarded the ontological and epistemological importance of spatiality. The source of the materialist interpretation of spatiality as adopted in this study is based on the acceptance that space is socially produced and is a manifestation of social life in a series of relationships for both individuals and groups. According to Edward Soja, spatiality cannot be separated entirely from physical and psychological processes. In addition to primary nature, the space of second nature shaped by human labor has been transformed through politics, ideology and production relations. The cognitive and mental space, which exists outside this physical space, shapes the spatiality of social life through representations such as symbolic images, cognitive maps, thoughts and ideologies (2017, pp. 162-163). In this context, a dialectical

relationship exists between the physical space in which we live and the mental space that reflects a spatialized mode of thinking. The urban design of the abstract space, which has been established through historical processes and has materialized in everyday life, shapes the urban landscape on the one hand, while constructing urban perception as a way of seeing on the other. It is necessary to address the process from the modern to the postmodern era in terms of historical materialism in order to understand how this intricate relationship took place. With the modern era, social life has become a space of visual culture. On the one hand, the consumption-based planning of social life by commercial capitalism, and on the other, the space of visual culture developing alongside written culture with developing communication technologies and the media, gained visibility from the second half of the 19th century onward. First, it would be helpful to define the visual culture that has emerged within the physical environment of the urban space and then to discuss how perceptions of the city have evolved through interaction with communication technologies.

The space of visual culture plays a significant role in the capitalization of urban space and in the emergence of consumption-based forms of life. For the first time in - history, comprehensive modernist urban planning was implemented in Paris by Georges Eugène Haussmann during the reign of Napoleon III. Commissioned by Napoleon III, Haussmann created the first topographical and cadastral map of the city as a result of his intense passion for spatial coordination. In these plans, urban space is treated in conjunction with elements such as railways and roads and both the interior and exterior spaces of Paris are addressed together. Haussmann built fairgrounds outside the city as exclusive venues for events and connected these areas with the city center via roads and railways. In addition, by creating new boulevards and streets in the city and organizing the distribution of cafes and shops throughout the city, he created a visual urban landscape (Harvey, 2012, pp. 141-146, 273-280). The ocularcentric perspective, which dominated modern urban planning in the 19th century, was shaped around capitalist motives. With this period, capitalism established not only areas of production but also areas of consumption, thereby introducing a strategy of control in the urban space. While the wealthy classes lived in the center of the urban space in ostentatious consumption areas, the lower classes were pushed to the periphery of the city and treated as unwanted people.

The domain of urban planning, which has taken shape in the modern era within the domain of visual culture, has also brought with it its own unique

architectural forms and typologies of individuals. In his quest to understand the dialectical image, Walter Benjamin attempted to give meaning to the concept of "now-time" in the axis of historical materialism. The "Arcades" project, composed of Benjamin's unfinished notes, are texts that address the dialectical image. In these texts, history is divided into two categories, namely temporal and spatial origins. As the intersection of this distinction, the dialectical image represents the now-time (2002, pp. 45-49). The construction of the past in the present is understood through dialectical images that appear as a dream. Benjamin argued that the Marxist method enabled a revival in the presentation of history and that addressing socio-cultural life on the basis of the principle of montage meant an analysis of modernity in terms of fragments. The Arcades Project showed that the experience of modernity in Paris can be approached not as a whole but through dialectical images in the axis of commodity fetishism. As the most significant architectural structures of the 19th century, the arcades are phantasmagorical spaces where collective desire emerges (Frisby, 2012, pp. 240-245). In the Arcades, Walter Benjamin argues that, in contrast to Max Weber's idea that the essence of modernity lies in the demystification of the social world and the dissolution of its magic, capitalism, with the process of industrialization, has created a space for renewed enchantment and reactivated mythical forces (Buck-Morss, 2010, p. 279). With their captivating and mystifying power, arcades, where a consumption-based lifestyle is created within the urban space, have become spaces of fantasy for the modern individual. Walter Benjamin's figure of the flâneur is an individual who walks through arcades and wanders along streets and avenues. The flâneur, unaware of all the images in this space, places them in his mind. The flâneur forgets the social class from which he came and feels right at home in the arcades housing luxury stores. The 19th-century arcades, lined with the shop windows of luxury stores illuminated by gas lamps, create a transitional space between the street and the indoor space, offering the flâneur a place where he can feel at home (Benjamin, 2012, pp. 127-131). The arcades that stand out as an architectural form in the modern era and the flâneur typology that inhabits them exemplify how the urban space has turned into a visual landscape. The visual relationship that the flâneur establishes with the arcades is a constructed example of urban perception.

Le Corbusier, a modernist architect, addressed the problems of existing cities at the beginning of the 20th century and offered proposals on what an ideal urban form should look like, and pointed to experts for the design of

cities suitable for the machine age. According to him, the decaying state of old cities causes physical and mental illnesses. Hygiene and mental health are related to the structure of cities and urban planning, and architecture must offer solutions in these areas (Togay, 2002, pp. 9-11). Le Corbusier based urban planning on vertical architectural forms rising on reinforced concrete columns, fundamental structural elements of modernist architecture, and on glass façades. These architectural designs, toward which the eye is directed within urban space, enabled the shaping of both urban space and residential areas as part of the geometry of power applied during the Roman Empire period. In the modernist planning process, which is based on the sense of sight, the Cartesian concept of the disembodied eye stands out (Pallasmaa, 2011, p. 37). According to Richard Sennett, the grid plan, one of the fundamental planning forms that shape the urban landscape in the modern era, just like ocularcentric architectural forms, is a decentralized and borderless form consisting solely of repetitions, very similar to the operation of an industrial machine (2013, p. 251). Thus, modernity has interpreted the overall surface of urban space and at the micro level, the buildings from a perspective shaped within visual perception.

In the perception and experience of architectural forms, while the Gestalt principles of visual perception are often emphasized, superficial images lacking existential depth have begun to be produced as a continuation of advertising and marketing strategies in the postmodern urban space. With this period, the deconstruction taking place in urban space fragments time and space on the one hand, while on the other hand it overturns the integrated appearance that enables us to bring the city into view. In this sense, although the urban landscape, which is characterized by the circulation of images and rootless symbols in the sociocultural sphere, retains an ocularcentric structure at the perceptual level, urban perception itself has a fragmented structure. One of the important factors that enabled the formation of this structure is the shift in the perception of time and space brought about by the communication and media technologies that have developed in postmodern culture. The constitutive dimension that space had since traditional society began to lose its strategic significance in this period. The spacelessness of speed comes with a spatial-strategic contraction (Virilio, 1998, pp. 127-129). In the Western world, which Virilio refers to as a "dromocratic society," the power of capitalism to shape social life has emerged with the expansion of the commodity world. According to Guy Debord, as a result of the commodification of material cultural life, the spectacle has taken over all

social life. What is visible has transcended the mere relationship established with the commodity and has imposed itself as the only reality (2006, p. 52). Thus, the reality of social life has been limited to what is visible and perceptible.

In urban life, the society of the spectacle is shaped around consumer culture in post-industrial social life. The process of the disenchantment of social life from magic and mystification, as indicated by Max Weber with modernity and rationality, has given way in advanced capitalist societies to a process of re-enchantment in architectural forms that he describes as cathedrals of consumption. In this social life where simulated interaction has replaced actual interaction, spaces are also transforming into simulated environments (Ritzer, 2000, pp. 150-154, 166-167). In consumer culture, spaces such as big shopping malls bring together independent and eclectic consumer goods under one roof, while mass media such as advertising and marketing similarly bring together images on an assembly line. This structure, which agrees with the eclectic world of postmodern culture, has caused the emergence of concepts such as the spectacle city and the design city while re-planning the postmodern city.

The concepts of the spectacle city and the design city, which emerged as a result of the proliferation of neoliberal policies in the urban space starting in the 1980s, encompass the process by which urban space is designed as objects of spectacle and their relationship with media technologies. The concept of the design city, which stands out in urban gentrification activities, is closely associated with the creative industries field. The concept of the spectacle city refers to the reorganization of public spaces in metropolitan areas and the proliferation of public spectacles. This concept also involves the city itself being elevated to the status of a spectacle (Soysal, 2011, pp. 395-396). During those years, as definitions of the cultural industry gave way to the concept of creative industries, the new media technologies falling under this concept penetrated the fabric of everyday life. In this context, the element that enables the concepts of the spectacle city and the design city to function at a global level is communication technology as part of technological progress.

At this current point, when the transformation of urban space is addressed from a socio-spatial perspective, the existence of mental space emerges as an integral part of cognitive processes alongside the physical space in which we live. The pressure of visual culture in such areas gains visibility as part of

a Western-style development model. The manifestations of capitalism in the urban landscape from the formation of the modern city to the postmodern city not only created a consumption-based urban design but also shaped the spatial perceptions of the individuals within these spaces.

Mediatized Urban Space and Urban Topography

The mediatized urban space and urban topography can be considered in two different ways. The first is the mediatized form of the city in the ecosystem created through cultural practices. The entry of the city into global circulation through the consumer culture characterizes this domain. The second is the mediatized urban experience in the axis of developing technological capabilities. The transformation of spatial perception through visual technologies, enhanced spatial experience, cities as communication networks interwoven with media technologies and urban screens as public communication platforms are the components of this domain.

The mediatization of the city within cultural practices is actually a product of the city's nature as both a setting and a medium. From this perspective, cities have historically served as the origin of human cultural production and expansion. City centers as a medium have assumed the role of intermediary in the transmission of culture. The defining role of cultural practices in social life has gained even greater importance with postmodernity. In the postmodern era, the distinction between culture, referring to a way of life in the anthropological sense, and high culture, denoting the uplifting cultural products and experiences in a spiritual sense, has become blurred (Featherstone, 2005, p. 159). The blurring of cultural distinctions is most apparent in the aestheticization processes of everyday life. The process of aestheticizing reality, which had previously taken place through television, has now extended to urban space. The decentralized subject of postmodern space coexists with different spatial experiences in the urban space in a controlled freedom of emotions. According to Fredric Jameson, the social transformation that took place during this period was not limited only to the cultural sphere; rather, an entirely new social structure emerged, referred to by various terms such as the consumer society, media society, information society, electronic society or "high-tech" society, all of which are named as "post-industrial" society (2011, p. 31). The characteristics that define this social structure are reflected in the daily practices of metropolitan life in a globalizing world.

As the natural connection of culture with geographical and social territories continues to fade today, the concept of deterritorialization is gaining visibility. The mediated experience of daily life through the media intertwines the mediated experience with the unmediated experience. The process of cultural mediation, accelerating with the effect of communication technologies, brings forth the idea of tele-visual cosmopolitanism. The consumer-based cultural space also fosters the idea of aesthetic cosmopolitanism (Tomlinson, 2004, pp. 148, 159, 269). Today, it is possible to see this concept of aesthetic cosmopolitanism up close when looking at the public spaces of major metropolises, from developed Western societies to developing non-Western societies. The giant screens, billboards, advertising posters and digital displays installed in city squares not only promote the city as a tourist destination but also help the urban topography to acquire a visual form. In this context, a consumption space that is outside the flow of everyday life, which is referred to by John Urry as the "tourist gaze", encompasses the consumption of the urban landscape. The process can be traced back to the new regime of seeing that developed in the 19th century and to Haussmann's works during the modernization of Paris. When Haussmann was rebuilding Paris, a majority of the working class was forced to move away from the city center. This is because the rents for the luxury apartment buildings along the new boulevards were high. The restructuring process led to residential segregation, effectively hiding poverty from the eyes of wealthy Parisians and especially visitors (2011, pp. 155-161). Haussmann's works not only shaped the urban space from a tourist's perspective but also introduced the first examples of a media-driven urban experience based on consumer culture.

Today, the process of integration of urban space with means of communication and information creates a mediated urban space. The accelerated pace of daily life, which David Harvey describes as the "time-space compression" and Paul Virilio as "dromology," affects both developed and developing countries at the same time. With the development of the global information network, the cybernetic space of the human world has been superimposed onto the physical space, which was planned by community-based urban planners and designed and constructed by architects (Bauman, 2006, p. 25). As cybernetic space gains popularity using computer technologies in everyday life, it also imposes a different form of experience on individuals compared to the physical space they once lived in.

As debates continue over whether globalization has ended space, Paul Virilio argues that it is not the end of history but the end of geography that we can

speak of today. Today, the meta-city, "virtual city", which is independent of location, has emerged as part of the third space. Screens in urban space and mobile phones, which are commonly used by the global population, form a tele-surface within a generalized regime of visuality. The meta-city rising from the artificial horizon of multimedia means has replaced the public spaces of the past today (2003, pp. 14-23, 106). This transformation in the perception of urban space can be traced back to Kevin Lynch's works. In his book "The Image of the City," Lynch attempted to explain how urban space is perceived on the basis of visual perception. City dwellers perceive their cities through mental maps, which are based on signs and visual references such as roads, boundaries and intersections. Accordingly, a vibrant and integrated physical environment capable of presenting a perfect image is socially important. Enabling group communication, this structure also offers unprocessed material for collective memory and symbols. In this context, the environmental image comprises the components of identity, structure and meaning (2011, pp. 5-8). Virtual experience sets based on visual technologies in the urban space take Lynch's concept of spatial readability one step further, raising the issue of screen-mediated processes of interpretation of this space.

Lev Manovich, with the concept of augmented space, defines a space where digital data and physical space converge. In this process, where the urban surface is filled with data, information and media, there are various technological applications that transmit dynamic data to the physical space or collect data from it. Some of these can be outlined as follows. Video surveillance has become increasingly common today and is used not only by governments, the military or companies, but also by individuals. Affordable, wireless and Internet-connected video cameras are now almost everywhere. While video and other surveillance technologies transform physical spaces and the people within them into data, "cellspace" is a space filled with data and can be accessed by the user via a personal communication device. Some data may originate from global networks such as the Internet, while others may be embedded in objects around the user. The cellspace can be thought of as a layer of information that is personalized by each user. Computer and video screens installed in public spaces show information to passers-by. These screens are becoming increasingly thinner, and they are no longer limited to flat surfaces. Also, they do not need darkness to be visible. In the short term, large and thin screens will be more common in both private and public spaces (2006, pp. 219-222). Based on Manovich's arguments, it can

be suggested that urban spaces are increasingly virtualized through the technologies mentioned as examples. Today, the concept of augmented space, which is interactive with physical space and extends beyond it, has become a part of daily lives of individuals.

Public spaces have an important place in the transition of urban space to a mediated form of urban experience in the axis of visual technologies. One of the authors who discusses the process of integrating public spaces with digital technologies, which is a concept referred to in the literature as the "screenification of urban space," is Mirjam Struppek. According to Struppek, urban screens stand out as both a moderator and a means of communication in the development of urban society. Struppek emphasizes that urban public space is a unique arena for rituals and the exchange of communication and states that the architectural dimension of the screen space has a changing importance in providing a stage for interactions. The role of digital screens in creating a local identity and their compatibility with urban design elements is a pressing issue today (2010). Struppek's main thesis is that the large public screens emerging in cities as a result of digital technologies are not just means of advertising, but also new public interfaces that visualize the city's communication infrastructure. These screens are platforms that visualize information flows, social interactions and media content in urban spaces. At this point, Struppek introduces the concept of the "visualization zone," an important concept in this process. Today, digital content has become more accessible with the Internet and other digital networks. The combination of large outdoor screens, virtual public spaces and our real world is emerging as a field of experimental visualization. In this regard, Struppek asks the following questions: Can we localize the enormous flow of information displayed on these screens? and can these spaces play a more active role in public communication, rather than just serving as a canvas for the digital world? (2009, p. 19). With these questions, Struppek offers an approach to urban screens that is not only critical but also potential-oriented. In this context, urban screens can turn into participatory public spaces through media art projects, public discussions and interactive content.

Another concept that describes the transformation of the city into spatial systems made up of media infrastructures beyond its physical boundaries in the digital culture of our time is the "media city." Developed by Scott McQuire, the concept of "media city" presents an idea of media architecture based on the gradual transformation of the city's architectural surfaces into

media surfaces. As building facades and public spaces are fitted with digital screens, the urban space is turning into a kind of visual communication platform. Scott McQuire bases his concept of the media city, which he addresses from a dialectical perspective, on the invention of new visual technologies and urban modernization processes that emerged in the mid-19th century. The increase in commodity circulation as market relations developed and the emergence of urban spectacle have contributed to the characterization of cities as a visual space. In this context, modern media is not just a form of representation but also creates spaces for new forms of social action in the formation of new forms of perception and information. In this process, the traditional coordinates of space and subjectivity are becoming unstable. As digital media offers instant feedback rather than a record of past events, social interactions occur on these mediums. The integration of media technologies into the urban environment has caused the erosion of the modern connection between place and identity. As urban structures have prioritized non-material exchanges, relational spaces have turned into the dominant form of experience in urban life. In the media city, smartphones, interactive interfaces, responsive architectural forms and smart settings are new living spaces where the meta-logic infiltrates the gaps in both public and private areas (2008, pp. 203-205). The screenification of urban space is not only limited to fixed screens. Mobile technologies and location-based media systems are also transforming the urban experience today. Scott McQuire introduced the concept of "geomedia" to express the combination of geographic space and digital media technologies. Emerging digital technologies such as smartphones, GPS systems and social media platforms are re-producing the urban experience by means of location-based media networks. As a result, the city has become not only a physical environment but also a media environment that is shaped by data streams. In this context, "geomedia" cannot be reduced to a single function like the emergence of new devices such as mobile media tools or the fact that these tools are local media tools. It should be defined as a new state of affairs that brings together contradictions of the 21st century, such as ubiquity, personalization and real-time convergence (2016, p. 6). With this concept, McQuire presented the layering of space with data, a network-based urban experience and in this context, the reshaping of public spaces beyond its physical boundaries.

In urban life, in the process of mediatization of daily experiences and the screenification of urban space, there exists a screen culture created by mobile screens, in addition to the large screens in public spaces. While Scott

McQuire defines this with the concept of geomedia, Nanna Verhoeff argues in her book "Mobile Screens" that the urban experience occurs through navigation screens. At the intersection of space and mobility, the process of transition from a representational system to navigation in the visual domain of urban space stands out as a form of seeing. This state, which characterizes the transition culture, brings together urban screens and performative cartography (2012, pp. 167-170). Following Verhoeff's arguments, mobile screens used by individuals come to the fore in their perception and experience of urban space. These personalized screens offer individuals a virtual spatial experience that goes beyond physical cartography as they navigate the urban space. Thus, the perceptions of individuals about the urban space in which they live are shaped at the intersection of these two spatial experiences. Edward Soja offers a similar idea with the concept of the "third space" (1996). The concept of the third space is used to express a specific way of thinking about and interpreting socially produced space. Criticizing Marxist geography's tendency to privilege the social over the spatial, Soja proposed the concept of third space, which suggests that relations with spatial and social forms are mutually constitutive. Soja's concept of the "third space," which he proposes by considering cities like Los Angeles that exist at the intersection of reality and imagination, brings together physical space and the space that is represented and experienced. While visual technologies stand out in this spatial layering, the urban experience is becoming associated not only with architecture but also with processes of representation and visualization.

Mike Davis's book "City of Quartz" (2006) addresses the formation process of the today's urban space in Los Angeles from a critical perspective in terms of socio-economic and cultural dimensions. In his book, Davis discusses not only the transformation of urban space and racial-class and spatial segregation on the axis of capitalism but also the urban image formed on the axis of the cultural industries and the process of the screenification and visualisation of urban space. Davis analyses Los Angeles as a city that produces myths. The Hollywood narratives, media representations and the production of tourist imagery make the real social contradictions of the city invisible. While all these spaces turn the city into a mediatized image, the city is transforming into a stage that is viewed rather than a space that is lived in. The process of the screenification of urban space in Los Angeles creates a visual regime within a strategy of inclusion and exclusion, in which desired elements are made visible while undesired elements are made invisible. The

city is increasingly taking on the form of a simulacrum with advertisements, data screens and navigation systems.

To summarize, the mediatized urban space has emerged in the dialectical process on the axis of the modernization of urban space and the emergence of new media tools in the 19th century. The acquisition of a spectacle form by urban space on the axis of consumption culture and with the development of technical devices, especially the camera, has led to urban topography taking on the form of an imaginary reality. As part of the development of communication technologies, urban public spaces were initially fitted with giant screens and advertisements in the digital culture sphere, but over time, with the invention of mobile devices and their integration into daily life, a virtual topography started to emerge outside the city's physical space. In this context, the process of urban surfaces becoming screens, the mediatization of urban life and the convergence of space with data layers all involve digital technologies.

The Loss of Optical Distance and Sociality in The Screenification of Urban Space

The idea of sociality, which is a product of humanity's coexistence, has emerged based on the perception of reality in the collective process and the distinctions, boundaries and intersections among institutions, actors and classes in the dialectical process. The technological developments brought about in the 19th century have increased dependence on images and visuals. In the preface to his book "The Essence of Christianity", Feuerbach says, "But for the present age, which prefers the sign to the thing signified, the copy to the original, representation to reality, appearance to essence" (1881, p. 13). The notion put forward by Feuerbach in the 19th century became an actual reality in the 20th and 21st centuries. According to Susan Sontag, much of the concern that the real world is being replaced by an image world points to the decline of the image in the Platonic meaning, as Feuerbach did. Accordingly, an image is real as long as it looks like something real and it is made up as long as it does not represent anything beyond that resemblance. However, the photograph has made it possible to redefine reality (2008, pp. 182-185). From Sontag's perspective, reality is reconstructed within the technical means of the period. However, all optical devices invented in the 19th century, especially the camera, have enabled seeing beyond the human eye and identifying the observer. These devices first made it possible to see without the body by reorganizing the optical distance between objects and the eye in the perception process of the eye. They then built an autonomous and productive observer in parallel with the increasing image production

that began in the 19th century. Consequently, the regime of power over the body in modern society has reorganized the observer by standardizing it (Crary, 2010, pp. 162-163).

Discussions about seeing and the observer are emerging as part of the regime of power over the body. The positioning of objects through optical distance, which is presented based on the viewer's eye within the tradition of perspective, is a fundamental element of visual perception. However, while advancing technological devices paved the way for disembodied seeing or mediated and standardized seeing through a technical medium, they have also reconstructed the optical distance between individuals and objects. In his book "The Vision Machine", Paul Virilio highlights how, within a system he refers to as the "vision machine," the act of seeing has been taken out of humanity's hands and transferred to the domain of machines by modern technologies. Arguing that there are three different logics involved here, Virilio defines the era of the image's formal logic as the age of painting, engraving, etching and architecture, and notes that this era ended at the end of the 18th century. The age of dialectical logic is the age of photography and cinema, which was shaped in the 19th century. The age of paradoxical logic started with video recording, holography and computer graphics. and the period at the end of the 20th century is characterized by the end of modernity and the logic of public representation. At this point, although people have gotten used to the formal reality of traditional image representation and the reality of the dialectical logic of photographic and cinematic representation, they still cannot fully comprehend the virtualities of the paradoxical logic of the digital image (1994, p. 63). Virilio argues that the vision machine and modern technologies not only produce images but also automate the process of seeing. It is no longer people but machines that see and transmit the image. The means of image production, namely cameras, video, satellite imaging and computer graphics, which have caused the technologization of perception, are reshaping human perception. In this way, experiences in daily life are increasingly transforming from direct experiences into experiences mediated through images. This also turns reality into a simulation and replaces the system of representation with a system of simulacra.

According to Jean Baudrillard, the transition from analogue image to digital image exemplifies the systematic destruction of reality. While the disappearance of the analogue image eliminates the need for an objective reality, technology turns nature into the virtual rather than reflecting it. Analog photography consists of the combination of the light reflected by the subject and

sight, whereas with digital photography, the image is transformed into a synthetic form produced in a computer program. While analogue photography, the mechanical reproduction of the image, creates an illusive environment, digital photography and image, as a representation without a frame of reference, characterizes a stage beyond the horizon where the distinction between the real and the unreal collapses (2019, pp. 26-32). Paul Virilio also holds a similar opinion about the loss of the horizon and perspective. In his book "Negative Horizon", he states that the concept of the horizon is the basis of perspective, spatial orientation and distance and argues that technology has eliminated the geographical horizon over time. While telecommunications and visual technologies enable the elimination of distance, television, video and computer screens create a new electronic horizon. As a result of the process which Virilio refers to as the dromologic revolution where space is reduced to time, technology has begun to control experience by compressing space into instant visual streams. This paves the way for an aesthetic of disappearance and a politics of disappearance. Since ancient Greece, the first political act in terms of political philosophy was the establishment of the formal structure of the city in relation to the concept of citizenship; however, today these two areas are going through a fundamental transformation. In today's transnational state and transpolitical process, a new structure is emerging where citizenship is disappearing, and spatial boundaries are vanishing (2005, p. 165). Following the arguments of both Baudrillard and Virilio, it seems that we have entered a new process in which the social fabric, which was previously established within the domains of history, politics, economics and culture, is now being undermined as digital images become integrated into every aspect of social life in the domain of digital culture. Today, models have taken over even the most ordinary parts of life within a structure where the genetic code acts as a model in an apocalyptic process. As digital becomes a part of daily life, images transform the process of human perception. Yes or no responses to the images are perceived as part of a warning system. In this process, every image, every media message and every functional object around us functions as a test. Objects and images help individuals test their own reflections during the process of reversing the object (Baudrillard, 2001, pp. 107-111). Considering the transformation of urban space from Baudrillard's perspective, the distance lost in social life not only causes a loss of reality but also reverses the subject-object dichotomy, resulting in the loss of the spatiality of space. In this process, individuals have become part of a mechanism that continuously produces data within the visual systems of technical devices.

Today, the concept of augmented space, which is the result of the convergence of physical space with digital data layers, is transforming into an imaginary reality in urban life with smart city panels or data visualization techniques. According to Baudrillard, the image here is not one that comes from the optical distance between the subject and the image it creates over the course of history and an image capable of producing an illusion, but, on the contrary, an image that ends the illusion and the imaginative thinking that results from it in a synthetic form. In this context, while the image takes on a synthetic form, it loses its source and can be produced as virtual reality (2005a, p. 94). The virtual reality of the city, which is created with the help of visual technologies, also causes the boundaries between space and place to blur. The French ethnologist and anthropologist Marc Augé seeks to construct an anthropology of urban life by defining the era we live in as a stage of super modernity. According to Augé, extremism has become the main mode of life in the stage of super modernity in which we live. The super modernity, which manifests itself in the form of an excess of events, an excess of space and the individualization of references, has structurally transformed social life. In this period, the relationship between space and place has disappeared in the spatial and temporal dimensions of the entity. In an anthropological context, a space only becomes a place when it is identified, historical, and relational, but in the age of super modernity, "non-lieu" spaces became prominent (2021). Augé's arguments suggest that, within the transnational cosmopolitan life of super modernity, space loses its anthropological content by losing its characteristic of place. When this set of ideas is associated with Virilio's concept of the "vision machine," there is a transition to a virtual stage in a universe where systems of representation have collapsed in the era of the paradoxical logic in the creation of image. In this context, in the process of urban space meeting image technologies, not only is space's relationship with the physical topography not lost, but the city's imaginary reality produced within these mediums takes on a synthetic form and becomes part of social circulation. Consequently, the historicity and social nature of urban space ends at the intersection of physical and virtual spaces.

In his book "No Sense of Place", Joshua Meyrowitz discusses the disappearance of a sense of place in the context of the influence of electronic media on our social behaviors as a result of developing technological capabilities. In discussing the relationship between the media and our behaviors and social roles, Meyrowitz also questions the transformation of the public space

and new group identities. In his book, the author suggests that there has been a shift in Americans' perception of space, emphasizing that electronic media has combined social spaces that were previously separate, shifting the boundary between private and public behavior toward the private space and weakening the relation between social situations and physical spaces. Today, the traditionally interconnected components of the surface have been severed by electronic media (1985, p. 308). The influence of electronic media within the city's regime of visualization is experienced in a similar way. While individuals perceive physical and digital topography simultaneously through visual technologies, the city's regime of visualization is eroding the distance required for sociality. At this stage, the city takes on an imaginary landscape form. Jean Baudrillard points out that after World War II, cities were planned as centers of production and reproduction, but that this ended today. Today, the production of simulacra is realized not through twinning or duplication, but through genetic miniaturization. In this universe where reanimation and entropy no longer exist, cities are reduced to their smallest forms by a memory that belongs to no one and forgets nothing (2005b, p.106). Thanks to the city's developing computer and internet technologies, maps and sketches that are accessible even on cell phones enable people to hold a miniature version of the city they live in right in their hands. The combination of the visualization trend on city streets and the digital image of the city created through the processing of micro-scale data accompanies the isolation and segregation in the physical space of the city.

Considering humanity's sense of sight and its status as an observer, the optical distance between the subject and the object is seen as a key element in visual perception within Alberti's perspective tradition. Mechanical optical systems have over time replaced the human eye's ability to see, bringing vision to the forefront by mediums. While subjective and objective forms of the act of seeing have emerged in parallel with the development of technological tools, the control of vision and the perception of reality on the axis of the control of the body have undergone a structural transformation in the field of digital culture. It is observed that space and time, which are the ontological foundations of the entity, began to be defined within an accelerated regime of truth during this period. The perception of space in general and of the cities we live in specifically has begun to be reproduced within digital vision systems in a universe where the distance between subject and object is lost, rather than as part of an organic connection established with the city. As the lost sense of physical distance becomes increasingly integrated into

seeing through digital devices, the culture and social fabric through which cities have historically connected with the place are eroding. This transformation is reshaping not only the city's perceived landscape but also the sociality within it. While these technologies erode the boundaries between the private and public spaces, the city's consumption-based visual landscape and its miniaturized image are intertwined.

Conclusion

Throughout history, cities have hosted humanity as centers of political, socio-economic and cultural activities. As urban spaces have transformed in the process of interaction with developing technological capabilities and cultural practices, individuals' perception of the city has also changed. The transformation of urban spaces, which accelerated from the mid-19th century onward, has increasingly subjected cultural space to a regime of visuality through means of communication and media technologies. and today, while humanity is trying to fit the city into a screen, it is also installing screens within the city. In this context, this study addresses the issue from a socio-spatial perspective by questioning how the city of the future will shape up on the axis of image technologies that are developing in the field of digital culture. The socio-spatial perspective emphasizes the spatial as much as the social, focusing on spatial forms and relationships within the capitalist manifestations of space. In this context, the study attempts to explain the process of the screenification of urban space today by addressing it in a dialectical process. Today, cities ranging from major metropolitan areas to smaller towns take form in a general regime of visualization. This trend can be associated with the concept of visual culture in the socio-cultural space, but it deserves a more detailed explanation. For this reason, the study approached the process from a critical perspective while defining the moments in the visualization process of the urban space in a holistic form.

Looking at the historical development of cities, visual imagery plays an important role. In Western-style urbanization processes, urban space is designed in an ocularcentric way, while the individual's perspective within that urban space is also organized by the social system. In this context, the central perspective which we might describe as the biopolitics of urban space designs both the general surface of the city and its residential areas and architectural forms. The political and sociocultural organization of the urban space as a center of supervision and control is one of the fundamental motifs shaping urban morphology and designs the city as a visual landscape.

Based on the theoretical discussion centred on the theoretical paradigm proposed in this study, the key finding of the research is that development in urban design and information technologies in the modern period are the two fundamental elements in the visualization of urban space today. The first of these elements, which is the construction of urban design based on visual imagery, has a past that dates back to the Roman Empire and is not only related to today's visual climate. The second element, which is the process of development in information technologies, brings about the screenification of urban space within the general regime of visualization in the sociocultural space. The process of screenification of urban space gains visibility as part of many interrelated technical developments in this context. The mediatization of urban life, the concept of augmented space, which means the enrichment of space with layers of data, and public screen technologies are emerging as the components of the screenification of urban space. In this context, the screenification of cities is a complex process that includes multidimensional phenomenological experiences on the city-individual axis. Some of these experiences contain visual themes created through the interactive surface of the city's general surface, which are also referred to as media architecture. Other experiences include relationships established with the city's miniaturized visual reality through technological means such as mobile phones and tablets. Both forms of communication are dynamic elements that influence the relationship an individual establishes with himself and with other people in the urban space.

Another finding reached as a result of the theoretical discussion in this study is that while all the elements that give cities a form of imaginary reality in today's consumer culture aestheticize urban space, authentic forms of existence are rapidly lost. Advertisements, marketing campaigns and contemporary forms of art are replacing forms related to memory and history in the urban space. The consumer culture that causes the sense of place to disappear by homogenizing space on a global scale also meets individuals through screens, billboards and interactive surfaces in public spaces. In this context, the concept of the meta-city stands out and this urban design comes to life through multimedia capabilities

As a result, the anthropological relationship between place and people is increasingly disappearing. Spatial practices and regimes of seeing designed by the system are replacing them. This urban design, which is a result of Cartesian perception of space, also characterizes a stage in which the act of seeing and the object being seen take on a fetishist character. The new design

of urban space, in which all senses and modes of communication other than seeing are ignored in the phenomenological perception of space, isolates the individual from the social life they live in and drags them into a sense of alienation.

The structuring of cities with informatics, digital technologies and information infrastructure is transforming the perception of space. The experience of virtual space which exists beyond the physical space and develops in relation to that space brings a miniaturized version of the urban topography to individuals' cell phones, tablets and computers. This new urban experience, where physical, digital and visual data layers are intertwined, creates an interactive human-machine relationship. In an era when optical distance is lost in our relationship with urban space and other individuals, the process imposes a new ontological and epistemological form of existence promoted by what Virilio calls the vision machine. As a result, while urban spaces which take on a form of interface between the individual and society transform into visual media surface, the physical horizon of the past gives way to a digital horizon.

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AN OUTLINE OF VIRTUAL PRODUCTION IN THE DIGITAL AGE

Ayşe OKUMUŞ[1]

Introduction

In today's media ecosystem, where digitalization is rapidly accelerating, visual content production processes are undergoing a profound transformation. One of the most significant components of this transformation, *virtual production*, refers to a hybrid production model in which physical production environments are integrated with computer-based digital production technologies in real time. Virtual production should not be understood merely as a technical innovation; rather, it represents a paradigm shift that redefines the ontology of filmmaking processes (Silva, 2024, p. 2). Virtual production, in its broadest sense, can be defined as a production approach that enables the integration of the physical and digital worlds through real-time technologies. Within this approach, visual effects that are traditionally applied during the post-production stage in conventional filmmaking are incorporated into the production phase, allowing outputs that closely resemble the final image to be achieved even during the shooting process (Kahraman, 2023, p. 1). In this respect, virtual production leads to a redefinition of the concepts of time and space within the production process. Kadner (2019) defines virtual production as a broad conceptual framework encompassing computer-assisted production techniques and emphasizes that this system is fundamentally based on a production practice that occurs at the intersection of the physical and digital worlds (p. 3). Within this framework, virtual production constitutes a multi-layered structure shaped by the integrated use of augmented reality (AR), virtual reality (VR), computer-generated imagery (CGI), and real-time game engines (Kadner, 2019, pp. 3-4). In the context of this study, which focuses on the conceptual aspects, the virtual production in question will be examined in greater detail.

The Concept of Virtual Production

Virtual production is the transformation of production processes from a linear structure into a simultaneous and interactive model. While in traditional

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filmmaking pre-production, production, and post-production operate as sequential stages within a linear process, virtual production reorganizes these stages into a parallel structure (Silva, 2024, p. 3; Kadner, 2019, p. 4). This transformation enables faster feedback throughout the production process, allows creative decisions to be tested in real time, and minimizes the margin of error.

Öztürk defines virtual production as a system in which physical sets and digital imagery are integrated in real time and argues that this system constitutes a structure that transforms traditional production models within the film industry (2023, p. 1). In this context, virtual production should be understood not merely as a technical tool, but also as a methodology that reshapes the logic of production.

One of the most prominent features of virtual production is the use of real-time rendering technologies. Real-time rendering enables the instantaneous creation and visualization of scenes, allowing directors and production teams to view outputs that closely approximate the final image during the shooting process (CG Spectrum, 2022, p. 15). This capability, particularly when combined with LED display technologies and camera tracking systems, makes it possible to achieve a seamless integration of physical and digital elements.

One of the key technologies employed in this production model is In-Camera Visual Effects (ICVFX), which enables digital backgrounds to be projected in real time within the set environment through LED screens. In this way, actors can interact directly with the digital environment rather than relying on green screens, thereby enhancing the naturalness of their performance (Kahraman, 2023, p. 1; Öztürk, 2023, pp. 7-8). Furthermore, this system strengthens visual coherence by allowing light and shadow interactions to occur realistically within the physical environment.

Virtual production also introduces an interdisciplinary approach to production. In contrast to traditional filmmaking, where departments operate independently, this new model restructures them around simultaneous data sharing and collaborative workflows (Kadner, 2021, p. 12). This transformation contributes to the emergence of a more flexible, dynamic, and creative working environment within production processes.

However, virtual production is not merely a technical transformation; it also influences the very nature of cinematic narrative. The integration of digital

environments into the production process in real time leads to a reconstruction of the perception of reality and to the evolution of visual storytelling toward a simulation-based structure (Kahraman, 2023, pp. 6-8). In this context, virtual production blurs the boundaries between the reality represented by cinema and technologically constructed production.

In conclusion, virtual production can be positioned as a multidimensional production framework that integrates physical and digital production processes, transforms the linear production model, and reshapes creative workflows through real-time technologies. In this respect, it stands at the center of a comprehensive transformation that affects not only film and television production but also all domains of digital content creation (Söğütlüler, 2022; Kozan, 2023).

Historical Development of Virtual Production

The emergence of virtual production technologies should not be regarded merely as a recent innovation; rather, it should be understood as the result of a long-term transformation shaped by the evolution of visual effects and digital production techniques throughout the history of cinema. In this context, the origins of virtual production extend from early cinematic techniques to technological advancements that have developed alongside the process of digitalization.

Since the early periods of cinema history, the pursuit of creating an illusion of reality has been one of the fundamental motivations of filmmaking. Techniques such as matte painting, optical effects, and miniature sets, employed in this context, are considered early examples of efforts to produce visual realities beyond the physical world (Kahraman, 2023, pp. 3-4). However, these techniques could not be fully integrated into the overall creative process due to their heavy reliance on post-production workflows and their limited flexibility.

With the advent of the 1990s, the incorporation of digital technologies into film production marked a significant turning point in the field. In particular, the development and widespread adoption of computer-generated imagery (CGI) enabled visual effects to be used in a more flexible and comprehensive manner. During this period, green screen technology became one of the primary tools for integrating physical footage with digital environments (Öztürk, 2023, pp. 5-6). However, this method still largely relied on a post-production-oriented workflow and made it difficult to anticipate the final image during the shooting process.

Another significant stage in the development of virtual production emerged with the integration of game engines into film production. In particular, film-like content known as machinima, created using game engines, paved the way for the adaptation of real-time visualization techniques to cinematic production (Halaçoğlu, 2023, pp. 74-75). This process represents the beginning of a transformation in which the boundaries between cinema and game technologies have gradually diminished.

Since the early 2000s, directors and technology developers have turned toward experimental practices that laid the groundwork for virtual production. In this context, digital production techniques employed in the projects of filmmakers such as George Lucas, James Cameron, and Peter Jackson played a pioneering role in the development of virtual production (Kadner, 2019, p. 2). James Cameron's Avatar (2009) is widely regarded as a major milestone in this field, due to its integrated use of motion capture and virtual camera systems.

In line with these developments, the Virtual Production Committee, established in 2009, played a significant role in shaping the technical and conceptual framework of virtual production (Kadner, 2019, p. 2). This initiative contributed to the recognition of virtual production not merely as a technical innovation, but as a new production paradigm.

With the 2010s, advancements in game engine technologies and real-time rendering facilitated the widespread adoption of virtual production in practical applications. The use of powerful game engines such as Unreal Engine in film production made it possible to generate visual content instantaneously and enabled directors to intervene in scenes during the shooting process (Halaçoğlu, 2023, pp. 80-83). This development contributed to the direct integration of production processes with creative decision-making.

One of the most critical turning points in the industrial-scale adoption of virtual production has been the implementation of LED display technologies. In particular, the LED volume systems used in The Mandalorian (2019) enabled digital backgrounds to be created in real time within the physical set environment, and this technology rapidly became an industry standard (Kahraman, 2023, p. 5; Öztürk, 2023, pp. 7-8). This system has not only enhanced visual realism but has also significantly reduced dependence on post-production processes.

The historical development of virtual production has not been limited to technological advancements; it has also led to fundamental changes in the

organizational structure of production processes. In traditional filmmaking, departments operate independently, whereas in this new model they are restructured around simultaneous data flow and collaborative practices (Kadner, 2021, p. 12). This transformation has made filmmaking processes more flexible, efficient, and creatively dynamic.

In recent years, virtual production technologies have expanded beyond cinema and television, becoming increasingly prevalent in various fields such as advertising, the gaming industry, and digital content creation. This development indicates that virtual production should be regarded not merely as a filmmaking technique, but as a multidisciplinary model of media production (Söğütlüler, 2022; Kozan, 2023).

In conclusion, the historical development of virtual production represents a multilayered process of transformation, extending from analog effects techniques to digital production technologies, and from linear production models to real-time and interactive systems. This process has evolved in parallel with advancements in cinematic technologies and has, today, become one of the fundamental paradigms of visual content production.

Technical Structure and Components of Virtual Production

Virtual production is based on a complex production system in which multiple technological components operate simultaneously and in an integrated manner. This system is formed through the convergence of real-time visualization technologies, camera tracking systems, game engines, LED display infrastructures, and data integration mechanisms. In this respect, virtual production should not be regarded merely as a technical tool, but rather as a multilayered digital production ecosystem.

One of the most fundamental components underlying the technical structure of virtual production is real-time rendering technology. Real-time rendering enables the instantaneous creation and display of digital scenes to the user. Through this technology, directors and production teams can simultaneously observe outputs that closely approximate the final image during the shooting process and make immediate adjustments to the scene (CG Spectrum, 2022, p. 15). Rendering processes that traditionally take hours or even days in conventional production workflows can be completed within milliseconds in this system.

One of the most important tools that enable the effective use of real-time rendering technology is game engines. Advanced game engines such as Un-

real Engine make it possible to generate high-resolution visuals instantaneously and to manage in-scene interactions in real time (Halaçoğlu, 2023, pp. 80-83). By ensuring synchronization between physical and digital elements, game engines occupy a central position within the technical infrastructure of virtual production.

Another critical component of the virtual production system is camera tracking technology. These systems detect the position and movement of the physical camera in real time, transmit this data to the game engine, and ensure that the digital scene is updated in accordance with the camera's motion (Öztürk, 2023, p. 9). As a result, digital backgrounds can respond realistically to physical camera movements, creating a natural sense of perspective for the viewer.

One of the most visible and impactful components of this technical infrastructure is LED display systems, commonly referred to as LED volumes. These systems replace traditional green screen methods by enabling digital backgrounds to be projected in real time within the physical set environment. In this setup, images generated by the game engine are displayed on LED panels and captured directly by the camera (Öztürk, 2023, pp. 7-8). This approach, known as In-Camera Visual Effects (ICVFX), significantly reduces the need for post-production processes (Kahraman, 2023, p. 1).

One of the key advantages of LED volume systems is the ability to generate the parallax effect in real time. As the camera moves, the perspective of the background shifts accordingly, allowing the scene to be perceived as three-dimensional and realistic. This enhances the viewer's sense of immersion and strengthens overall visual coherence (CG Spectrum, 2022, p. 4).

Another important component within the technical structure of virtual production is visualization workflows. These workflows encompass various techniques employed at different stages of production. Among these are subcategories such as previsualization (previs), technical visualization (techvis), and postvisualization (postvis). Previs enables the digital planning of scenes prior to shooting; techvis assists in determining technical requirements; and postvis allows for the preview of visual adjustments after filming (Öztürk, 2023, pp. 3-5). Collectively, these systems contribute to a more controlled and predictable management of the production process.

In addition, motion capture technologies also play a significant role within virtual production systems. Motion capture enables the transfer of actors'

movements into digital environments, allowing virtual characters to be created in a highly realistic manner (Kadner, 2019, p. 14). This technology is particularly effective in performance-driven scenes, where it strengthens the integration of digital and physical elements.

Virtual production also encompasses a broad technical spectrum that includes various types of applications. In this context, the system can be categorized into different domains such as visualization, performance capture, hybrid production, and in-camera production (Kadner, 2019, pp. 11-17; Öztürk, 2023, p. 2). This diversity demonstrates that virtual production possesses a flexible structure that can be adapted to different scales and production needs.

Another important dimension of the technical system is data integration and real-time communication infrastructure. Within virtual production environments, continuous data flow is maintained among different departments, enabling the entire production process to be synchronized in real time (Kadner, 2021, p. 12). This, in turn, allows the production process to be managed more efficiently and flexibly.

Finally, the technical structure of virtual production is not limited to hardware components alone; it also requires the integration of software and organizational elements. The software, hardware, and human resources involved in this system operate within an interconnected ecosystem, ensuring that the production process progresses in a holistic manner.

In conclusion, the technical structure of virtual production consists of a multilayered system in which real-time rendering, game engines, camera tracking systems, LED display technologies, and visualization workflows operate in an integrated manner. Unlike traditional production methods, this structure brings together the digital and physical worlds within a simultaneous production environment, thereby introducing a new paradigm in visual content creation.

Production Process and Workflow In Virtual Production

Virtual production fundamentally transforms the linear workflow traditionally dominant in filmmaking by adopting a simultaneous and interactive production model. In conventional filmmaking, pre-production, production, and post-production are structured as distinct, sequential stages, whereas virtual production reorganizes these phases into an interconnected system characterized by parallel processes and continuous interaction (Silva, 2024,

p. 3; Kadner, 2019, p. 4). This transformation not only optimizes time management within the production process but also makes creative decision-making mechanisms more dynamic.

The traditional production model largely operates on a structure based on an "assembly line" logic. In this model, each stage depends on the completion of the previous one, and the fact that visual effects are largely deferred to the post-production phase results in a loss of flexibility within the production process (Kadner, 2019, pp. 4-6). In contrast, virtual production eliminates this linear structure by transforming production processes into a parallel workflow, allowing different departments to operate simultaneously.

The virtual production pipeline can generally be examined in three main stages: pre-production, production, and post-production. However, unlike the traditional model, these stages are not strictly separated by rigid boundaries; rather, they form an interconnected structure through continuous data flow and feedback mechanisms.

Pre-Production Stage

One of the most significant features of virtual production is the shift of a substantial portion of the production process to the pre-production stage. At this stage, scenes are designed and visualized in digital environments in advance. Through previsualization (previs) techniques, directors and production teams are able to plan the composition, camera angles, and movements of a scene in detail prior to shooting (Öztürk, 2023, pp. 3-4).

In addition, technical visualization (techvis) practices determine the technical requirements of a scene and enable elements such as equipment placement, camera movements, and lighting setups to be tested in advance. This contributes to minimizing potential technical issues that may arise during the shooting process (Öztürk, 2023, pp. 4-5). At this stage, virtual production allows creative decisions to be made at an early stage and ensures that the production process proceeds in a more controlled manner.

Production Stage

The most significant transformation in the virtual production pipeline becomes evident during the production stage. At this stage, physical filming and digital production are carried out simultaneously. Using LED display systems and real-time rendering technologies, digital environments are created directly on set and captured by the camera in a form that closely approximates the final image (Öztürk, 2023, pp. 7-8).

During this process, camera tracking systems detect the movements of the physical camera in real time and transmit this data to the game engine, ensuring that the digital scene is updated simultaneously. In this way, seamless synchronization between physical and digital elements is achieved (Öztürk, 2023, p. 9). This integration allows scenes to be evaluated in real time during shooting and enables necessary adjustments to be made instantly.

Another important feature of virtual production during the production stage is its iterative workflow. In traditional models, once a scene is completed, it is difficult to revisit; however, within virtual production environments, scenes can be continuously revised and different alternatives can be tested rapidly (Kadner, 2019, pp. 6-7). This enables the creative process to become more flexible and experimental.

Post-Production Stage

One of the most striking features of virtual production is the substantial integration of the post-production process into the production stage. In the traditional model, most visual effects are applied during post-production, whereas in virtual production these processes are carried out during filming (Kahraman, 2023, p. 1). This approach not only saves time but also facilitates cost control within the production process.

However, post-production is not eliminated; rather, it is largely reduced to fine-tuning and refinement processes. At this stage, post visualization (postvis) techniques are employed to optimize the final form of scenes and to implement necessary adjustments (Öztürk, 2023, p. 5).

Simultaneous and Collaborative Structure

One of the most important features of the virtual production pipeline is its ability to provide a simultaneous and collaborative production model. In this model, art directors, visual effects specialists, software developers, and directors can work concurrently within the same digital environment (Kadner, 2021, p. 12). This enhances communication throughout the production process and enables creative decisions to be made more rapidly.

This structure also gives rise to a data-driven production process. Data generated throughout the entire production cycle is shared across different departments, enabling continuous optimization of the workflow. This approach demonstrates that virtual production is not merely a technical innovation, but also an organizational transformation.

General Evaluation of The Pipeline

In contrast to traditional production processes, the virtual production pipeline exhibits a non-linear, flexible, and interactive structure. This structure enables continuous feedback at every stage of the production process and allows for real-time interventions (CG Spectrum, 2022, p. 5). In this respect, virtual production represents a fundamental transformation in filmmaking processes, both technically and organizationally.

In conclusion, the virtual production process operates through a collaborative pipeline in which pre-production, production, and post-production stages are interconnected and supported by real-time technologies. Compared to traditional production models, this structure provides a faster, more flexible, and more creative production environment, thereby establishing a new standard in visual content creation.

Economic and Industrial Impacts of Virtual Production

The widespread adoption of virtual production technologies is transforming not only technical production processes but also the economic structure and production relations of the media industry in a fundamental way. This transformation manifests itself across multiple dimensions, including cost optimization, production efficiency, labor structures, and the economics of content production. In this context, virtual production can be considered one of the most significant components of the increasingly digitalized media economy.

Transformation of Cost Structure

In traditional film production, costs largely stem from physical set construction, location shooting, travel expenses, and extensive post-production processes. In contrast, virtual production eliminates a significant portion of these cost factors, offering a more controlled and predictable budget structure. In particular, with LED display technologies and digital set design, dependence on physical locations is reduced, and production processes can be relocated to studio environments (Öztürk, 2023, pp. 7-8).

However, although the initial investment costs of virtual productions such as LED volume systems, high-performance hardware, and software licenses—are relatively high, they contribute to a reduction in overall costs in the long term through reusability and process optimization (CG Spectrum, 2022, p. 6). This makes virtual production economically advantageous, particularly for large-scale productions.

Time and Efficiency Advantages

One of the most significant economic contributions of virtual production is the substantial reduction in production time. In traditional models, post-production processes that can take weeks are integrated into the production phase through virtual production, resulting in considerable time savings (Kahraman, 2023, p. 1). This enables projects to be completed more rapidly and accelerates the content production cycle.

Moreover, real-time feedback mechanisms enable the early detection of errors, thereby reducing the need for reshoots and contributing to lower production costs (Kadner, 2019, p. 6). In this respect, virtual production offers a structure that not only reduces costs but also minimizes production risks.

Transformation of Labor and Occupational Structure

The widespread adoption of virtual production is also significantly transforming the labor structure within the media industry. While traditional film production has been dominated by labor structures based on physical production processes, virtual production has shifted the focus toward software developers, game engine specialists, data analysts, and digital artists, who now occupy a central position in the production process (Kadner, 2021, p. 12).

This transformation has led to the increasing visibility of the concept of digital labor within media production processes. Indeed, in new media environments, production processes are no longer limited to professional teams; rather, they have evolved into a structure in which users also participate in content creation. This development reinforces the "prosumer" model, in which the roles of producer and consumer become intertwined (Güler, 2024, pp. 136-137).

According to Güler (2024), with the development of digital production tools, users have moved beyond being mere consumers of content and have become active producers (p. 136). In this context, virtual production offers a structure that contributes to the democratization of content production processes.

New Media Economy and The Transformation of The Commodity Form

Virtual production also transforms the "commodity" nature of content produced within the new media economy. While in traditional media structures content is presented within a one-way production-consumption relation-

ship, in new media environments content has become reproducible, transformable, and capable of being redistributed across multiple platforms (Güler, 2024, pp. 138-139).

This development has led media products to evolve from being merely consumable objects into continuously reproduced forms of value. Digital platforms (such as YouTube, Twitch, and gaming platforms) promote user participation in content creation, thereby giving rise to a new economic model (Güler, 2024, pp. 143-144).

In this context, virtual production strengthens the sustainability of this economic model by accelerating content production processes and reducing costs. At the same time, the reproducibility of content across multiple platforms enhances the economic value of media products.

Industrial Transformation and Competition

Virtual production technologies are also reshaping the dynamics of competition within the media and entertainment industry. Production processes that have traditionally been dominated by large-budget studios are now, through virtual production, enabling smaller-scale producers to create high-quality content. This shift contributes to increased competition within the industry and expands the diversity of production (Söğütlüler, 2022).

Moreover, the decreasing spatial dependency in content production on a global scale facilitates international collaboration and accelerates the globalization of production processes. This development contributes to the evolution of the media industry into a more flexible and dynamic structure.

General Evaluation

The economic and industrial impacts of virtual production are not limited to cost and efficiency; they also transform production relations, labor structures, and the fundamental dynamics of the media economy. In this context, this technology, in conjunction with the digitalization of production processes, enables content production to become faster, more flexible, and more accessible.

In conclusion, virtual production emerges as a production model that drives a comprehensive transformation within the media industry at both the micro level (production processes, costs, and labor) and the macro level (economic structure, competition, and content circulation).

Conclusion and Critical Evaluation

Beyond the technical and economic advantages, it offers in visual content production, virtual production technologies also generate significant transformations in the ontological, epistemological, and ideological dimensions of media production. In this context, virtual production should be understood not merely as a production technology, but as a media practice that reshapes the perception of reality, transforms labor processes, and reconfigures cultural production relations. One of the most debated aspects of virtual production is the increasing blurring of boundaries between reality and simulation. While traditional cinema is grounded in the representation of physical reality, virtual production reverses this relationship by enabling reality to be digitally reconstructed. This shift gives rise to a production model in which cinematic reality no longer needs to directly reference the physical world (Kahraman, 2023, pp. 6-8). In this context, virtual production can be evaluated within the framework of Jean Baudrillard's theory of simulation. Images produced in digital environments do not merely represent reality; rather, they construct a new level of "hyperreality" in their own right. This condition complicates the viewer's ability to distinguish between reality and fiction and contributes to the transformation of visual culture. Another important dimension in the critical analysis of virtual production concerns digital labor and production relations. In new media environments, production processes are no longer limited to professional teams; rather, they increasingly involve the active participation of users. This development gives rise to a new production model in which the roles of producer and consumer become intertwined. According to Güler (2024), with the development of digital production tools, users assume both producer and consumer roles, a process defined as "prosumption" (pp. 136-137). While this model creates the impression of a democratization of content production, it simultaneously leads to the invisibilization of user labor.

From the perspective of Fuchs's theory of digital labor, user participation in content production processes often constitutes a form of unpaid labor. This indicates the emergence of a new mode of exploitation within the digital media ecosystem, of which virtual production is a part. Accordingly, virtual production should be understood not only as a technology that facilitates production processes, but also as a structure through which capitalist relations of production are reproduced in the digital environment. The widespread adoption of virtual production has also generated significant debates regarding the nature of creative processes. While creativity in traditional

filmmaking has largely been grounded in physical production practices and human labor, within virtual production environments these processes are increasingly shaped by software- and algorithm-based structures. This raises the question of whether creative decisions are increasingly shaped or constrained by technology. In particular, the predefined templates and digital asset libraries offered by game engines, while accelerating the production process, may also lead to a limitation of aesthetic diversity (Halaçoğlu, 2023, p. 85). In this context, virtual production creates a field of tension between creative freedom and technological standardization.

Virtual production technologies are developing under the control of a limited number of technology companies due to high infrastructure costs and dependency on specialized software. Game engines such as Unreal Engine and software solutions provided by major technology firms constitute the foundation of production processes. This situation leads to an increase in technological dependency in media production and reinforces industrial concentration. In this context, virtual production simultaneously democratizes content production while concentrating on the means of production under the control of a limited number of companies. This contradiction can be regarded as one of the fundamental paradoxes of the digital media economy. Another significant impact of virtual production is the transformation of cinematic narrative structures. Real-time production capabilities enable narratives to be constructed in a more flexible and dynamic manner. However, this development may also increase the dominance of visual elements over narrative, potentially leading to a superficialization of content. The increasing prominence of visual effects and digital environments brings with it the risk of narrative elements being relegated to a secondary role. In this context, virtual production can be considered a technology that reopens the debate on the aesthetic and narrative balance of cinema.

Although virtual production offers significant advantages in technical, economic, and creative terms, it also brings with it a range of critical challenges. These challenges are concentrated in areas such as the transformation of the perception of reality, the invisibilization of digital labor, the increasing technological dependency of creative processes, and the intensification of industrial concentration. In conclusion, while virtual production constitutes a transformative development in media production, its social, economic, and cultural implications require comprehensive and multidimensional evalua-

tion. This technology should be understood not only as a means of transforming production processes, but also as a structure that reshapes the fundamental dynamics of media culture.

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DIGITAL GAME AS A CINEMATOGRAPHIC NARRATIVE MEDIUM: IDEOLOGY AND SUBJECT CONSTRUCTION

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Introduction

When studies on film projection are examined, it is seen that the practices that laid the groundwork for the emergence of cinema date back to Antiquity. Plato's allegory of the cave, Mo Ti's experiments with the dark chamber, Aristotle's studies on optics, and Ibn al-Haytham's experiments on light constituted the philosophical and scientific foundations of image projection. Nicéphore Niépce's capturing of the first photograph in 1826 marked a critical turning point in terms of recording a still image (Kızıldemir, 2015, pp. 55–56). However, for cinema to truly come into existence, it was necessary not only to record still images but also to create the illusion of movement. In 1832, Joseph Plateau and Simon von Stampfer, almost simultaneously, invented the Phenakistoscope and the Stroboscope; in 1834, William G. Horner invented the Zoetrope. Charles Coleman Sellers developed the Kinematoscope in 1861, and Eadweard Muybridge developed the Zoopraxiscope in 1879. In 1891, Thomas Edison and William Kennedy Laurie Dickson developed the Kinetoscope, a device that enabled individual viewing. Based on a similar working principle, the Eidoloscope was invented in 1895 by Woodville Latham and his sons Otway Latham and Gray Latham; in the same year, the Vitascope, whose rights were later acquired by Edison, was also introduced (Monaco, 2000, pp. 69–100; Hankins and Silverman, 1995, pp. 37–71; Kılıç, 2012, pp. 173–259). The accumulated weight of these technical developments throughout the process ultimately made the birth of cinema possible with the Lumière Brothers' invention of the Cinématographe in 1895. Thus, cinema evolved beyond being merely a technological invention and became a collective viewing practice and a cultural apparatus. This cultural apparatus, particularly through the specific practices it offers as a viewing experience, has also been subject to various critiques throughout

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history as an ideological apparatus, a means of reproducing cultural hegemony, and a mechanism that facilitates the dissemination of popular culture.

Moreover, as one of the art forms most closely intertwined with technological developments, cinema has been in a continuous state of transformation from the production stage to the viewing experience in parallel with these advancements. Throughout this technology-driven transformation, cinema has established itself as a fundamental component of visual culture in terms of both its capacity to offer visual experience and its potential to structure narrative. This central position of cinema has not been limited to traditional viewing practices; it has also influenced digital media forms.

One of the most prominent examples of this influence is digital games. There is a bidirectional convergence process between cinema and digital games based on mutual interaction (Grusin, 2016). Since the 1980s, the stories and characters of popular digital games have been adapted into films; conversely, cinematic production practices and narrative techniques have increasingly been employed in digital games (Çakay and Erkılıç, 2025; Çoban et al., 2025; Özgör, 2023). Within the scope and limitations of this study, it should be noted that the primary focus is on the second direction of this convergence; namely, the transfer of cinematographic narrative techniques into digital games and the ideological implications of this transfer from a technological perspective. Indeed, today digital games can be considered as cinematic experiences. While performing in-game actions, the player simultaneously experiences the virtual reality constructed by the game's narrative. This experience is structured through cinematographic elements (such as camera angles, lighting, and editing), thereby rendering games increasingly cinematic in nature. In many games, cinematic sequences have been integrated into the narrative in order to immerse the player more deeply in the simulated world and to enhance the expressive power of storytelling. Özgör defines video games as the "heirs of cinema," emphasizing that they "technically employ the methods of cinematic art" (2023, p. 489).

This transformation can also be seen as cinematic production, finding a new and different field for itself. In addition to the traditional film experience, cinematic production practices have now become a fundamental component of digital games. With the process of digitalization and convergence, the narrative structuring methods and visual language of cinema have been transferred to the digital game medium; thus, games have been positioned as ar-

eas where cinematographic techniques are reproduced. At this point, a critical question arises: How is cinematic production practice transferred to digital games, and what ideological and cultural mechanisms are at work in this transfer process? Do the ideological production and hegemonic reconstruction processes revealed by critical approaches to cinema also apply to digital games?

Within the framework of these questions, it is necessary to emphasize that digital games function as tools of cultural transmission (Bezgin, 2024, p. 1051; Savi & İlden, 2025, p. 141). Through the themes they address, the narrative worlds they construct, and the character types they present, games convey specific systems of values to players. Questions concerning how these value systems are structured, which ideological codes they are embedded with, and through which discourses they are presented to players constitute the main problematics of this study. Accordingly, within a critical perspective, this research aims to examine how cinematographic narrative techniques are employed in digital games and the ideological implications of this usage. In order to fully grasp this framework, it is first necessary to address what digital games are, how they have evolved within a historical process, and the origins of the concept of game in human history.

From Game To Digital Game: Historical Process and Narrative Structures

Digital games are interactive forms of games developed through software based on computer technology and experienced in electronic environments. Differing from the physical practices of traditional games, these structures are played via digital platforms and dedicated gaming devices, offering players real-time interactive experiences through virtual worlds structured by specific rules. In this context, one of the most defining characteristics of digital games is their ability to provide players with real-time activity within a virtual environment (Bayzan & Güneş, 2022, p. 26). This interaction occurs through the device used by the player (such as a computer, tablet, smartphone, or game console), the game software itself, and other players. Today, although the term "game" has become closely associated with digital platforms in the contemporary context, its origins extend back to a much more archaic past. According to Huizinga, game is a phenomenon that predates cultural formations (2018, p. 17). For culture presupposes human society, whereas the act of play can also be observed in the animal world. From this perspective, game functions not merely as a form of entertainment but as a fundamental mechanism for cultural transmission, socialization, and social learning. It serves as a medium through which culture is learned, and

through which social practices such as law and warfare are internalized, preparing individuals for participation in social life. In this sense, game can be regarded as a communicative practice that transmits cultural values across generations. According to Caillois, game is an activity that is freely chosen, separated from everyday life, characterized by uncertain outcomes, devoid of material gain, governed by specific rules, and inherently fictional in nature (2001, pp. 9-10)[3]. Focusing on the action within a game, Bernard Suits defines a game as "a voluntary attempt to overcome unnecessary obstacles" (1995, p. 85) . According to Salen and Zimmerman, "a game is a system in which players engage in an artificial conflict defined by rules, resulting in a quantifiable outcome" (2004, p. 80). As can be seen, the concept of a game has been defined in divergent ways across different disciplines and theoretical perspectives. Stenros (2017), noting that the question of what constitutes a game has been a central topic in game studies, examined over 60 definitions of "game" in the literature from the 1930s to the present and pointed out that this has led to conceptual confusion. Indeed, "in its most general sense, a game is a social world created by players coming together in a specific space, using their imagination within a set of rules" (Suküt, 2023, p. 107). However, according to Sutton-Smith a game is such a broad concept that it cannot be confined to a single form of activity, spanning a wide spectrum from infant games to the Olympics, gambling, and festivals (1997, pp. 1–17). Within this framework, definitions of games reflect cultural ideologies rather than scientific facts, and each discipline defines a game in a way that legitimizes its own worldview.

Looking at the historical process, it is evident that games have served multidimensional functions throughout human history. From prehistoric games played with bone and stone pieces, to the arena games of the Ancient Age, from the war-training games of the Middle Ages to the leisure activities of the Modern Era, games have been an inseparable part of real life, functioning as tools for escape, education, entertainment, socialization, and mental practice. As Bozkurt puts it, games go beyond mere entertainment; they play a significant role in shaping social structures and constructing individual identities and roles (2025, p. 105). However, it can also be argued that the most

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[3] Caillois classifies types of game into four fundamental categories: *agon* (competition/struggle), *alea* (chance/fortune), *mimicry* (imitation/role-playing), and *ilinx* (vertigo/dizziness).

radical transformation of the concept of games has occurred through digitalization. According to Jesper Juul (2003), computers and digital processors have become fundamental tools for games, in a manner similar to how the printing press did for literature or cinema for visual storytelling. Therefore, digital games can be regarded as a continuation of a long history of gaming; yet they represent a profound transformation of the concept of games by allowing rules to be managed by the computer, freeing players to focus on strategy and fictional worlds.

Digital games are interactive structures produced through computer technology and software infrastructure, and played in electronic environments. Their primary distinction from traditional games lies in the fact that the gaming experience takes place via digital devices, providing players with real-time visual and auditory feedback. These structures, which respond dynamically to user inputs, aim to deliver varied experiences by constructing virtual environments through specific sets of rules, goals, and patterns of challenge. Spanning a wide spectrum from single-player experiences to multiplayer online platforms, digital games can be played on different hardware platforms such as computers, consoles, and mobile devices. The most defining feature of digital games is their ability to enable real-time interaction with the game world and provide immediate feedback to the player. This interaction simultaneously encompasses the player's relationship with the hardware device, the game system, and other players, thereby integrating human-machine, human-game, and human-human interactions within a single experiential framework. In this context, the digital game experience emerges not merely as a technological act but as a multilayered practice of interaction. Indeed, digitalization has profoundly redefined the social dimension of games by transforming the act of playing, which historically took place face-to-face or individually, into multiplayer experiences that transcend geographic boundaries, as well as device-mediated individual gameplay. Digital games have thus evolved beyond being merely interactive entertainment practices to becoming storytellers themselves. According to Wei, Bizzocchi, and Calvert storytelling has found expression across various media, including websites, multimedia platforms, and interactive narratives, in line with developments in media technologies (2011, p. 1). Advances in digital game technology have further deepened this process, making storytelling an integral component of the game world. "Narratological studies that view games as tools for storytelling and argue for their recognition as art emerged as key academic perspectives, particularly in the early 2000s"

(Çoban, Aydıngüler, & Elal, 2025, p. 448). In this context, leading narratologists such as Henry Jenkins, Brenda Laurel, and Janet H. Murray argue that digital games share a common ecology with narrative-based media forms such as drama, cinema, and novels (Karadeniz, 2017, p. 59). The 3D cinematic narratives crafted and presented to players in contemporary digital games have created a new environment for storytelling. As emphasized, this development necessitates examining how narrative-based digital games utilize the technical affordances of cinematography within the framework of digital storytelling.

Cinematographic Technologies and Production Practices In Digital Game Development

The foundations of digital game history were laid in the mid-20th century through electronic experiments conducted for academic purposes. The first electronic graphical game was realized in 1947, followed by the "Nimrod" computer in 1951, which was specifically produced for gaming purposes. A turning point in digital game history came in 1958 with Will Higinbotham's development of *Tennis for Two*, enabling the first game experience based on human-to-human interaction. In 1962, Steve Russell's design of *SpaceWar* marked the next step in this development. Until the 1970s, digital game production largely remained within academic circles; however, during this period it began to gain commercial momentum. The production of dedicated gaming consoles and devices compatible with various electronic platforms made gaming an integral part of everyday life. With the advent of the internet for individual use, the act of playing digital games, which initially developed as an individual practice, gained a renewed social dimension, transforming human machine interaction into human machine human interaction (Yaver, 2024, pp. 25-45).

The parallel development of digital games since the 1950s alongside technological advances has also deepened academic studies and classification efforts in this field. These classifications have been diversified according to numerous variables, such as the platform on which the game is played, narrative structure, form of interaction, devices used, and genre categories. However, as Demirbaş (2015) emphasizes, the genre categories currently used for digital games have largely been determined by industry actors and players, relying on consumption-oriented practical classifications rather than scientific criteria. Since these categories do not systematically address the narrative and interactive characteristics of games, they create validity issues in academic research. Within this context, it can be argued that digital

games need to be examined not only in terms of content and narrative but also from the perspective of production processes. Indeed, the game development industry has undergone a profound transformation in the past decade, with production tools and infrastructures reshaping both the technical capabilities and narrative possibilities of games. The simultaneous accessibility of games across multiple platforms, including consoles, computers, and mobile devices, represents one of the clearest indicators of this transformation. Moreover, advances in graphics processing unit (GPU) technology have brought cinematic-quality visual production into games through real-time lighting simulation, high-resolution texture processing, and physically based rendering (PBR) technology. This development has increasingly transformed digital games into a production practice that overlaps with cinema both technically and aesthetically.

When this technical transformation is considered alongside the diversification of gaming platforms, an even more comprehensive picture emerges. Digital games can be played on platforms that differ in technical capacity and usage practices, such as personal computers, home consoles, portable consoles, and mobile devices. The technical differences among these platforms directly shape gameplay mechanics, design principles, visual quality, and narrative structures. Games developed exclusively for mobile devices, for example, are clearly distinguished from console or computer-based productions that require high graphics processing power, both aesthetically and narratively. At the same time, the concept of digital games encompasses all of this platform diversity. When this ecosystem is considered as a whole, it represents a large-scale domain of cultural production and consumption. From a critical perspective, digital games are described as "one of the most important cultural industry products of digital and promotional capitalism," emphasizing that games are produced for their commodity value (Binark and Sütcü 2008, pp. 41-42).

The economic scale of the digital game industry clearly demonstrates that this field goes far beyond being merely a form of entertainment. According to Statista (2024), the global video game market is expected to grow by 46.43 percent between 2024 and 2029, reaching 666.69 billion dollars. When evaluated by platform, mobile games alone accounted for half of the global market in 2022, generating 91.8 billion dollars in revenue, followed by console games with 52.2 billion dollars and PC games with 36.5 billion dollars. A similar growth trend is observed in the user base, with the number of digital game users projected to reach 3.02 billion by 2029. Additionally,

data from the fourth quarter of 2023 show that 84.7 percent of internet users played games through some digital platform. These figures illustrate the extent to which digital games have penetrated everyday life and highlight their role as one of the most dynamic consumption areas in the cultural industry. Within this growing digital game sector, narrative-driven productions are increasingly gaining a decisive position. According to Figueiredo and De Sousa (2024), some video games can also be considered interactive cinema in terms of their narrative depth and visual language. These games are generally designed within a linear narrative model, a structure that lays the groundwork for a new hybrid form of storytelling between cinema and games. In this hybrid form, the player ceases to be a passive consumer of the presented content and instead becomes an active participant in the experience, even assuming the role of a kind of content creator. Evaluated in the context of the authors' reference to Jesper Juul's concept of game cinema, it is argued that because the player is not merely a spectator but a direct actor in the story, game cinema has the potential to create experiences that are far more immersive and emotionally engaging than traditional cinema. In this case, the convergence of these two fields, namely the incorporation of cinematic narrative into digital games and the inclusion of game logic in interactive cinema, has blurred the boundaries between player and audience. This situation particularly enables a unique experience in which the player within the game, unlike the passive consumer of traditional cinema, can guide the narrative through their own choices and, in doing so, becomes a producer of the experience (Aydın and Yel, 2025, p. 1224). This process demonstrates that digital games are increasingly assuming the role of storytellers, moving well beyond mere entertainment. Like films, these games often feature a linear narrative structure, which, as noted, aligns with the historical function of games because from their origins, games have served as tools for transmitting cultural values and preparing individuals for participation in social life.

The incorporation of cinematic narrative language into digital games and the presence of short cinematic sequences within games, described by Jenkins as micro-narratives, maximize dramatic impact and diversify and deepen the gaming experience. These narrative structures, crafted using cinematic language, provide players with an experience enriched visually and emotionally beyond mere game mechanics (Jenkins, 2002). This enrichment process has directly contributed to the increasing preference for story-driven games

among players and to the rising popularity of these games. Games that incorporate cinematic narrative elements create an emotional depth that binds the player to the game, establishing a privileged position for this genre within digital game culture. A careful examination of current data from the game industry shows that cinematic narrative is not chosen merely as an aesthetic option. Rather, it has become an indispensable component of high-budget games because it strengthens the emotional connection between the player and the game. This development has also given rise to a search for cultural legitimacy. According to Švelch (2023), the video game industry has adopted the function of art awards to create cultural canon and generate economic gain, establishing its own awards ecosystem. Within this system, Švelch critically positions The Game Awards, the ceremony with the largest audience, as a platform where artistic achievement is celebrated on the surface while a strong commercial and marketing logic operates behind it, reproducing industrial hegemony. In this context, examining the awards presented within The Game Awards provides an analytical framework for concretizing the prominence and cultural positioning of games based on cinematic narrative within the industry. The Game Awards 2025, comprising more than 30 different categories, reveals the multi-layered structure of the sector. These categories span a wide range, from technical achievement to storytelling, and from independent productions to the esports ecosystem. However, a closer analysis of the award structure also indicates that digital games are no longer regarded merely as "software to be played," but increasingly as "cinematic constructs to be watched and experienced." In this regard, in order to foreground cinematic features, specific categories from The Game Awards have been selected and tabulated. These include Best Narrative, which directly rewards storytelling; Best Art Direction, which focuses on visual composition and aesthetic design; Best Score and Music, which evaluates auditory atmosphere and musical composition; Best RPG, representing the genre with the highest narrative intensity; and Game of the Year, which reflects the industry's overall cultural judgment.

Year	Game of the Year	Best Narrative	Best RPG	Best Art	Best Score and Music
2025	Clair Obscur: Expedition 33	Clair Obscur: Expedition 33	Clair Obscur: Expedition 33	Clair Obscur: Expedition 33	Clair Obscur: Expedition 33
2024	Astro Bot	Metaphor: ReFantazio	Metaphor: ReFantazio	Metaphor: ReFantazio	Final Fantasy VII Rebirth
2023	Baldur's Gate 3	Alan Wake 2	Baldur's Gate 3	Alan Wake 2	Final Fantasy XVI
2022	Elden Ring	God of War	Elden Ring	Elden Ring	God of War

Year	Game of the Year	Best Narrative	Best RPG	Best Art	Best Score and Music
2021	It Takes Two	Marvel's Guardians of the Galaxy	Tales of Arise	Deathloop	Nier
2020	The Last of Us Part II	The Last of Us Part II	Final Fantasy VII Remake	Ghost of Tsushima	Final Fantasy VII Remake
2019	Sekiro: Shadows Die Twice	Disco Elysium	Disco Elysium	Control	Death Stranding
2018	God of War	Red Dead Redemption 2	Monster Hunter: World	Return of the Obra Dinn	Red Dead Redemption 2
2017	The Legend of Zelda: Breath of the Wild	What Remains of Edith Finch	Persona 5	Cuphead	Nier
2016	Overwatch	Uncharted 4: A Thief's End	The Witcher 3: Wild Hunt – Blood and Wine	Inside	Doom
2015	The Witcher 3: Wild Hunt	Her Story	The Witcher 3: Wild Hunt	Ori and the Blind Forest	Metal Gear Solid V: The Phantom Pain

Table 1: Selected Category Winners by Year at The Game Awards (2015–2025)

An examination of the eleven-year dataset covering the period from 2015 to 2025 presented in Table 1 reveals that productions centered on cinematic narrative elements have been systematically awarded within The Game Awards. This consistent pattern provides concrete evidence that the industry has internalized narrative quality not as a secondary technical addition but as a fundamental criterion of excellence. This convergence indicates that the success of a production is measured not only by mechanical proficiency but also by the harmony of core cinematic components such as visual composition, sound design, and dramatic structure. The dominance of the RPG genre in these categories, in particular, demonstrates that genre depth and cinematic language have become inseparable elements reinforcing industrial success. By 2025, the fact that *Clair Obscur: Expedition 33* secured top positions across five major categories, including narrative, art direction, and music, offers the most recent and comprehensive evidence of this structural transformation.

Based on these findings, the winners of the Best Narrative category, which directly rewards the genre structure in which cinematic storytelling is most intensively represented, have been taken as the primary reference. Among these productions, five digital games with the highest sales figures have been

identified and are presented in Table 2. These games have been comparatively analyzed in terms of genre, sales figures, game engine used, cinematic cutscene structure, narrative form, and average gameplay duration.

Game	Genre	Sales	Game Engine	Cinematic Cutscene Structure	Narrative Form	Avg. Duration
Red Dead Redemption 2	Action, Adventure	79+ million	RAGE (Rockstar)	Cinematic cutscene-focused, mo-cap	Linear, character-driven	40–60 hours
God of War	Action, Adventure	23+ million	Santa Monica Studio Engine	Cinematic cutscene-focused with mo-cap	Epic, character-driven	25–30 hours
Uncharted 4: A Thief's End	Adventure	18+ million	Naughty Dog Engine	Mo-cap-intensive, cinematic cutscene-focused	Linear, character-driven	15+ hours
The Last of Us Part II	Action, Adventure	10+ million	Naughty Dog Engine	Dense cinematic storytelling with mo-cap	Linear, character interaction-driven	25–30 hours
Clair Obscur: Expedition 33	Action, RPG	5+ million	Unreal Engine 5	In-engine, pre-rendered, and mo-cap	Linear, cinematic	30–35 hours

Table 2: Key Characteristics of Digital Games in the Sample

An examination of Table 2 shows that *Red Dead Redemption 2*, with sales exceeding 79 million, ranks at the top as the most widely played title in the sample, while *Clair Obscur: Expedition 33*, despite being the most recent production in the sample, draws attention with its sales surpassing 5 million in a relatively short period of time. These data clearly demonstrate the capacity of productions with a high degree of cinematic narrative intensity to reach large player audiences. When the table is evaluated as a whole, it is evident that all five productions rely on motion capture technology in the cinematic cutscene structure column. This technique, long utilized in the film industry, has, through its integration into the digital game sector, elevated the behavioral and expressive capacities of game characters to a level comparable to that of film actors. The fact that all productions in the table employ motion capture indicates that this technique has become an industrial standard for high-budget, cinematically driven productions. In terms of narrative form, all five productions adopt a linear narrative structure. Linear narrative refers to a mode in which the player progresses along a predetermined storyline, experiencing events as they unfold, while branching choices or open-world elements do not fundamentally alter the core narrative. This preference demonstrates that these productions adopt a design approach that prioritizes cinematic storytelling without allowing gameplay mechanics to over-

shadow narrative delivery. When the average gameplay durations are considered, it is notable that the productions in the table are positioned within a broad range varying from 15 to 60 hours. This duration intensity indicates that these productions subject players to a long-term narrative experience and that, over this period, the ideological impact of the cinematic language acquires a cumulative character.

When the data in Table 1 and Table 2 are evaluated together, it becomes evident that productions with dominant cinematic qualities have consistently dominated industrial success in the period from 2015 to 2025. The data for 2025, in particular, demonstrate that players increasingly seek to immerse themselves in high-quality visual storytelling experiences. The multiple awards won by productions such as *Clair Obscur: Expedition 33* in both technical and narrative categories, along with the massive sales figures exceeding 79 million achieved by games like *Red Dead Redemption 2*, concretely illustrate the decisive influence of motion capture-supported character performances and linear narrative structures on market share.

In this context, the increasing centrality of storytelling in contemporary games becomes evident. As Jenkins states, "game designers do not simply tell stories; they design worlds and shape spaces" (2003, p. 4). The question of through which production practices, tools, and conceptual frameworks this design process is realized emerges as a key issue within the axis of cinema–game hybridization. The answer largely lies in real-time rendering technologies, which have led to a profound transformation in the production infrastructure of the digital game industry, and in the organic relationship these technologies establish with cinematic language.

Convergence of Unreal Engine and Cinematic Production Practices

According to Manovich (2017), computer technology has not merely migrated traditional media (photography, books, cinema, etc.) into the digital environment; it has endowed them with the capacity for cross-device portability, mutability, and reproducibility through software. While hardware and software were inextricably linked in traditional media tools (such as a mechanical camera), the separation of software from hardware in digital media has made media infinitely expandable and manipulable. One of the most prominent examples of digital media's ability to constantly reproduce its own "media" (light, space, camera) at a software level, without being tethered to physical reality, is contemporary game engines. By reproducing the fundamental concepts and visual language of traditional cinematography at

the software level, game engines enable the construction of in-game cinematographic experiences. In this context, the most widely utilized engine is Unreal Engine. It has become a staple in film and television production, as well as in XR, AR, Mo-Cap, and VR technologies. This multi-domain utility, or what Jenkins describes as technical convergence, represents something far greater than a simple technological shift (2016, p. 36). As a paradigmatic example that fits this exact definition, Unreal Engine converges diverse media and technological fields within a single software platform. The engine's technical components, such as Nanite and Lumen, simulate the core elements of physical cinematography including light and camera at a software level, radically reducing the dependency on physical studio infrastructure. Indeed, the virtual studio applications becoming widespread in film and television production allow physical filming locations to give way to real-time rendering environments. This situation indicates not just a one-way transfer but a process of bilateral interaction (Çakır, 2006, p. 85). While Unreal Engine integrates the visual language of classic cinematography into game production, it also places the advancements of game technology at the service of traditional film and television production. As emphasized by Çakay and Erkılıç the inevitable result of this mutually transformative relationship between cinema and digital games is that games have become increasingly cinematic while films have acquired an increasingly game-like quality (2025, p. 142). When viewed through the lens of Bolter and Grusin's (1999) remediation theory, this process should be understood as a mutual and cyclical transformation rather than a one-way improvement. Just as the internet remediates television while television redefines the internet, Unreal Engine transfers the visual psychological codes of cinema and television into digital game production; simultaneously, it transforms traditional media through the advancements of game technology. According to Bolter and Grusin, digital media ontologically remediates its analog predecessors with its digital contemporaries. In this framework, Unreal Engine is more than a meta tool that utilizes the codes of cinema and television to enhance the impact of games on cinematographic narrative and storytelling; as a medium, it serves as an improver and unifier of traditional and digital media, reproducing real media by simulating it.

In this context, it can be argued that Unreal Engine is not merely a game production tool but attempts to make the interface between the two media invisible by remediating cinema within the game. Through real time render-

ing, physics based lighting systems, virtual production applications, and integrated performance capture (motion capture) technology via tools like MetaHuman, the digital game is increasingly acquiring the quality of a "watched fiction." To materialize this transformation, examining the interface of Unreal Engine carries particular importance.



Figure 1: Light and Camera Parameters in the Unreal Engine Interface (Epic Games, 2026a)

When the Unreal Engine interface is examined (see Figure 1), it is observed that the engine structures light and camera parameters to correspond exactly with the technical concepts of traditional cinema production. In terms of lighting design, parameters such as light temperature, intensity, and volumetric scattering are functionalized within the engine as direct digital equivalents of traditional cinema lighting practices. The situation becomes even more evident regarding the camera system: in addition to simulating real world camera formats such as 35mm Academy and IMAX 70mm, parameters for depth of field, aperture, and focal length also directly reflect real camera optics. All these parameters are calculated instantaneously on the engine's real time rendering infrastructure. Consequently, visual technical decisions in traditional cinema production are integrated into the production process simultaneously. This structure renders the boundary between the two media obsolete by transferring the technical codes of cinematographic language into the game production environment.

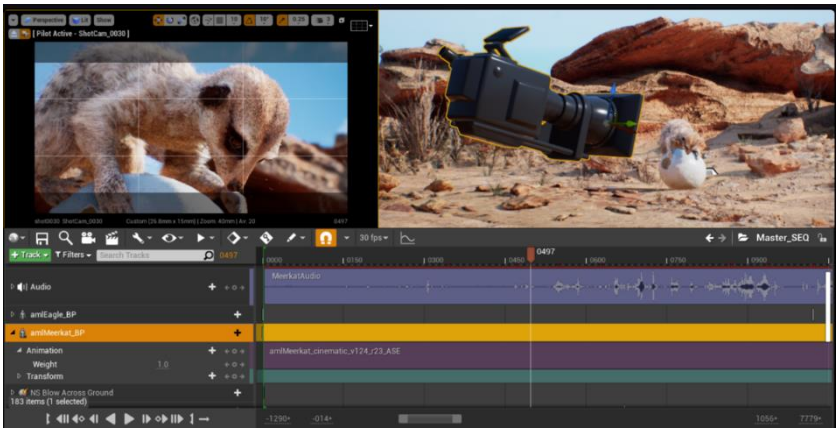


Figure 2: Unreal Engine Sequencer Interface: Scene, Camera, and Animation Management (Epic Games, 2026b)

As seen in Figure 2, another critical component of the Unreal Engine interface, the Sequencer tool, elevates this technical overlap to the level of scene management and editing. Sequencer reproduces the timeline infrastructure offered by linear editing software like After Effects or Premiere Pro, used in traditional film and television production, within a real time three dimensional environment. Through this tool, a virtual camera placed in the scene can be manipulated on a frame by frame basis via the timeline in terms of parameters such as aperture, focal length, and angle. Similarly, scene lighting values including color, intensity, and shadow softness can be adjusted instantaneously, and characters along with their animations can be integrated into the scene to apply transitions between two different animation sequences. All these elements are managed as layers on a single timeline. Thus, Sequencer transfers the linear editing logic of traditional cinema montage into a three dimensional virtual production environment, enabling the production of in game cinematic sequences, namely cutscenes[4] which are the fundamental carriers of storytelling. This technical overlap carries a meaning beyond a mere instrumental resemblance. The fact that cinematographic language permeates game production so deeply brings the question long asked by film criticism to the forefront for digital games as well: What

[4] Cutscene: A segment in digital games where the player's control is temporarily disabled. These are cinematic narrative sections based purely on observation. During these moments, the player remains solely in the position of a spectator and cannot provide input. These scenes are designed in a manner closely aligned with cinematic language in terms of camera angles, editing, and sound design. They are generally used to depict the game's plot or story, introduce characters, or convey emotional intensity.

ideological codes does this visual language carry, and through which mechanisms does it reproduce hegemonic values?

Game, Ideology, and Hegemony: A Critical Analysis of Cinematographic Narrative

Cinema theory has been shaped through three fundamental approaches following one another in the historical process. While realist theorists argue that cinema reflects reality as it is, formalists have proposed that cinema becomes art as it moves away from reality. Psychoanalytic theory, on the other hand, focuses on the relationship the spectator establishes with the screen and defines the cinema hall and the camera as ideological apparatuses. However, with the digitalization of cinema, these debates have gained a new dimension (Erkılıç, 2017, p. 61). The fact that reality is now produced through software tools instead of being recorded has fundamentally transformed cinema's relationship with reality; concepts of simulation and representation have become subject to re-examination. Digital games emerge at the exact intersection of these debates as a new field and tool that offers a simulated reality and positions the player in a specific ideological stance. As Friedman states, computer games function as powerful tools capable of conveying not just specific ideas, but entire structures of thought and holistic ways of making sense of the world (1999, pp. 132-134). Indeed, although digital games often appear as a new narrative form, they provide a basis for the reproduction of existing hegemonic discourses. The dominant narrative structure in cinema also teaches spectators how to look at the world. As an organic extension of this cinema, digital games reintroduce the same ideological patterns by instrumentalizing the language of cinematic narrative.

In this context, the weight of cinematographic narrative in digital games is materialized both qualitatively and quantitatively. According to official statements from Larian Studios, the game Baldur's Gate 3, which won "Game of the Year" and "Best RPG" at The Game Awards in 2023, reached an unprecedented cinematographic scale by containing over 174[5] hours of cinematic content (Steampowered, 2023). Similarly, according to reports from gaming communities, *Tales of Arise* offers approximately 10 to 15 hours of cinematic content based solely on cutscenes and character dialogues. *Clair Obscur: Expedition 33* continues this trend with a cutscene duration exceeding 7 hours. These data clearly demonstrate that contemporary digital games have moved

[5] This duration represents the maximum cutscene time obtained if the game's main story, along with all chapters and additional content, is completed in its entirety (i.e., a "completionist" run).

far beyond being merely interactive narrative environments; they offer cinematic experiences where the player is largely positioned as a passive spectator.



Figure 3: Cinematographic Cutscene Frame from the Game Clair Obscur: Expedition 33

Indeed, as a concrete reflection of this cinematographic intensity, the cutscenes of Clair Obscur: Expedition 33 fully deploy the technical tools of classical cinematic language. As seen in Figure 3, the depth of field is deliberately activated in a dialogue scene between two characters by using an over the shoulder shot; while the figure in the foreground is left out of focus, the character in the background is placed at the center of the dramatic emphasis. The dominance of purple and gray tones in the lighting design adds a melancholic and tense atmosphere to the scene, while the music functions as a tool for emotional guidance for the viewer. All these choices are products of a systematic cinematographic language directly derived from the classical narrative patterns of Hollywood cinema, encoding the power dynamics between characters at a visual level. At this point, Brooker's observation is explanatory: there is an established assumption in the gaming industry that "being more cinematic is better"; however, the privileged position of cinema within the dominant cultural hierarchy is functionalized by games as a tool for prestige (2009, p. 125).

Furthermore, the cutscenes within the game break the interactive structure of the medium, effectively casting the player as a purely passive film spectator. Through this transformation, ideological discourse is conveyed through a mode of reception where the player cannot develop active resistance. The increasingly widespread use of cutscenes since the 1990s and their evolution into short films have moved the player into a progressively more passive position within the hegemonic narrative language. In this process, the player temporarily loses control over the camera and the avatar, forced to watch

themselves acting outside their own will. The active interaction of the player, who begins to oscillate between the roles of spectator and user is momentarily suspended by cutscenes, and the player is positioned as a passive subject toward whom the ideological discourse is directed through interpellation (Garite, 2003, p. 4). On the other hand, limiting the ideological functioning of digital games solely to cinematic cutscenes would mean an incomplete reading of the medium's ontological structure (Turner, 2026). As Keever (2022) states with reference to Althusser, ideology does not consist merely of passive representations on the screen. It is a material apparatus that constructs individuals as subjects.

When the player exits the cinematic cutscene and regains control, they do not become liberated; on the contrary, they are subjected to a bodily discipline by the coded architecture of the game. As Keever (2022) notes, referencing Wendy Chun and Matt Garite, player decisions do not consist of actual choices. Every action that feels instantaneous and free is, in reality, nothing more than the unpredictable experiencing of a structure preplanned by the game's code. Every action of the player is integrated into the system after being filtered through a process of computational calculability. The theoretical framework addressed in this context reveals how digital games undertake an ideological function through cinematographic narrative. As previously mentioned, contemporary digital games contain significantly more dramatic cinematic scenes than many films, and these scenes establish a ground where ideological discourse is directly received by reducing the player to a passive spectator. These cinematic scenes are criticized for simulating and reproducing the editing logic, camera language, and dramatic tension techniques of the classical Hollywood narrative structure, thereby importing them into the game. From a narratological perspective, these games are evaluated as a new extension of traditional narrative tools such as film and the novel. Indeed, in terms of their narrative language, visual structures, and capacity for mass impact, digital games have transformed into media tools shaped along the axis of patriarchal capitalist ideology, overlapping with the commercial structuring of Hollywood (Kahraman and Fidan, 2022, p. 861; Sepetçi and Sağlam, 2022, p. 176). The most concrete reflections of this ideological axis manifest themselves in gender representations within games. While female characters are often designed in accordance with traditional beauty standards and the heteronormative male gaze, the male hero is placed at the center of the narrative, and sexuality is presented as a reward for achievement or the result of side quests. This trend is reproduced at both

the narrative level and within the game mechanics themselves. For instance, in *Clair Obscur: Expedition 33*, the placement of cosmetic content such as swimsuits, which provide no contribution to character statistics or game mechanics, as loot at the end of challenging side quests concretely confirms that the female body is still positioned within the digital game ecosystem as a reward for success and an object of consumption for the heteronormative male gaze (see Figure 4).



Figure 4: Swimsuit Costume of the Character in the Game Clair Obscur: Expedition 33 (Carr, J. 2025)

However, this hegemonic reproduction is not limited to visual choices; it is also embedded in the narrative skeleton of games. When examining the source of this skeleton, we encounter the narrative language of Hollywood. Digital games, along with cinematographic techniques, have internalized Hollywood's hegemony not only as an aesthetic but also as a mode of narrative construction. Therefore, to understand how these ideological patterns operate, it is first necessary to look at the Hollywood-derived structural templates that shape game narratives. In this context, Kallay (2013, p. 7), referencing Field, states that the Aristotelian three-act structure is the cornerstone of Hollywood screenwriting and that digital game design progresses within this very framework. These ideological patterns are further materialized through game analyses. According to Hammar's findings, contemporary digital games reproduce military fetishism and pro-military ideology through hours of cutscenes and Hollywood camera aesthetics (2019, pp. 279-300). Additionally, the objectification of female characters along the axis of the heterosexual male gaze is constructed directly through camera choices within these cutscenes. Colonial and hegemonic ideological discourses are likewise legitimized through such cinematic sequences. In this regard, when the five productions listed in Table 2, all of which won the "Best Narrative" award at The Game Awards, are examined, it becomes clear how hegemonic

values are reproduced through cinematographic narrative. Red Dead Redemption 2 reproduces the ideological framework of the frontier narrative by addressing the American frontier mythology and the rise of the modern state order through the tension between the pursuit of individual freedom and social order.[6] It presents the transformation of America into a "land of laws" through the axis of the ideology of civilization (Bello, 2024). The game God of War, while using Western mythology as a cultural frame of reference, conveys the transformation of masculinity, authority, and parenting practices through a father-son relationship. Thus, the game sanctifies the practice of parenting and the process of internalizing the patriarchal hegemony within this practice as a discipline of "raising a warrior" (Himawan, Fatmawaty, and Dodiyanto, 2022). The cinematographic narrative language adopted by these productions plays a decisive role in effectively conveying such ideological content to the player. To strengthen the dramatic structure, the expertise of filmmakers is utilized, particularly in cinematographic storytelling techniques. The most prominent examples of this approach are *The Last of Us* and *Uncharted 4: A Thief's End*, where Neil Druckmann, who possesses a background in cinema, served as creative director. Uncharted 4: A Thief's End, by virtue of its subject matter, places the Western male adventurer archetype at its center through a narrative of exploration and treasure hunting; it processes themes of family ties, passion, and betrayal by reproducing the myths of discovery found in popular culture (Manono, Mugubi, and Situma, 2023, p. 54). The Last of Us Part II builds its narrative on a cycle of violence and revenge, presenting a complex narrative structure that problematizes the ethical and emotional consequences of violence. Finally, Clair Obscur: Expedition 33 produces these themes on a different plane by reinterpreting cultural and aesthetic codes within the game's own framework through a narrative established in a fantasy universe.

The linear cinematic narrative existing in digital games creating an illusion of free will by offering limited choices to the player, positions the player within a continuous state of transitivity between Huizinga's "magic circle", established outside of reality, and Baudry's (1974) "cinema apparatus metaphor". In Huizinga's (2018) conceptualization, game is defined as an autonomous sphere with its own rules, detached from everyday reality. By en-

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6 In constructing this ideological framework, the game reconstructs the hegemonic masculinity roles and codes of patriarchal ideology as a product of social conditions (see Sepetçi & Sağlam, 2022)

tering this space, the player steps outside of ordinary life. Digital games reinforce this magic circle using cinematic tools, keeping the player within an experience of both interactive and passive reception. According to Baudry's apparatus theory, the spectator adopts the gaze created by the cinematic apparatus as their own, thereby becoming the subject of that gaze. In the context of digital games, this process acquires a qualitatively more advanced dimension. Unlike the passive spectator in a cinema hall, the player does not merely adopt the gaze produced by the simulated game world; they actively perform within that gaze. According to Sicart, this establishes a relation of embodiment, particularly through predetermined cutscenes and cinematic sequences (2012, p. 118). It integrates the player into the character's moral and emotional world, as the game's cinematic language forces a mandatory empathy. Consequently, rather than merely being in front of a medium of representation, the player experiences a sense of truly existing within that world. Especially when cutscenes, where interaction is suspended, come into play, the player is subjected to the domination of this very apparatus; as the ideological discourse is conveyed at a subconscious level, the player's ability to develop an alternative reading is entirely obstructed (Meskin & Robson, 2012, p. 212). As Říha states, cutscenes in computer games are designed in accordance with the established traditions of the classical film industry (2014, p. 662). However, this formal choice creates a severe rupture in the player's ontological position. In short, the cinematic apparatus is a structural interruption that runs contrary to the nature of play. As emphasized by referencing Eskelinen, Chatzizacharias, and Windig; while the gaming environment is fundamentally a "configurative" and active field of action, the player is detached from this configurative practice when cutscenes take over. Thus, the player loses their agency and is confined to a merely "interpretative", that is, passive and restricted, position, much like in traditional cinema. Moreover, this process creates a much deeper ideological encirclement compared to traditional cinema. For while the cinema spectator merely watches the film, the digital game player is first conditioned by the ideological and aesthetic codes of that world through cinematic cutscenes, and then begins to play by physically entering that world (Garite, 2003), albeit, of course, within the algorithmic boundaries the game provides. Thus, the positions of spectator and player operate successively and intertwined; the ideological discourse is reinforced in a dual-layered manner through both passive reception and active experience.

Finally, it can be stated that the process of technological convergence shaped along the axis of digitalization has brought cinema into interaction with next-generation media tools such as television, computer games, and virtual reality. Indeed, as Stam points out, "just as early cinema was neighbor to scientific experiments, burlesque, and small shows, the new forms of post-cinema are neighbor to home shopping, video games, and CD-ROMs" (Stam, 2014, p. 326). This proximity is fueled by a relationship of mutual exchange between cinema and digital games. Specifically, while classical Hollywood cinema derives narrative techniques it rarely resorts to, such as the first-person perspective, from digital games, digital games adopt the narrative templates of classical cinematography in terms of scene editing and dialogue structures (Bolter & Grusin, 1999, pp. 96-98). In this context, as seen in Table 1, Role-Playing Games (RPG) lead the genres that have achieved the most profound integration of cinematographic narrative with digital game mechanics. When analyzing the data, it is evident that RPG (Role-Playing Game) productions maintain a dominant presence not only in genre-based categories but also in prestigious categories such as "Game of the Year" and "Best Narrative". This trend is directly related to the narrative-oriented structure of the RPG genre. Indeed, narrative-driven RPGs are frequently defined as "interactive films", emphasizing that the player ultimately possesses very little control over how the plot unfolds (Barton & Stacks, 2019, p. 441). However, this interactive film experience offered by modern RPGs harbors a striking ontological contrast in terms of the use of the camera apparatus. While these games surrender to classical Hollywood editing and montage during the cutscenes where the narrative is conveyed, they radically dismantle this traditional cinematographic structure through the Third-Person (TPS) perspective that activates during actual gameplay moments, when the player explores the simulated universe. As Brooker points out, the first-person perspective shot is a part of traditional film language, yet it is a minor part and a rarely utilized shot (2009, pp. 127-128). Furthermore, while classical Hollywood cinema relies on constant cuts and editing, the First-Person (FPS) perspective, the primary domain of action in modern games, and the Third-Person (TPS) cameras widely used particularly in RPGs, provide a continuous point of view that remains uninterrupted until the character dies. In this context, the core gameplay camera of digital games radically breaks away from the classical mainstream Hollywood form; instead of the Eisensteinian tradition of editing/montage, it approaches an art cinema aesthetic rooted in Bazinian realism, reminiscent of its continuous long takes. However, when a narrative-driven RPG tells its story through

cutscenes, it replicates the passivizing ideological apparatus of mainstream Hollywood, and this ideological coding does not vanish the moment control is handed back to the player. On the contrary, under the illusion of acting out of their own free will, the player reproduces the hegemonic discourse internalized through those cutscenes. Behaving as a free agent in the moments they seize control, the player actually operates within the boundaries of the coded world already constructed by the cutscenes, adopting that world's values and logic (Garite, 2003; Jennings, 2019, p. 96). Furthermore, the player's imitation of a character lays the groundwork for ideological values, such as heroism, Western values, and property relations, to be transmitted directly as an "experience". In summary, whereas the point of view in cinema is under the director's control, the camera in a game is delegated to the player's control. This transfer provides the player with a false sense of power, and through the transparency of the interface, ideology is rendered invisible. No longer are we confronted with merely a watching eye. There is an active subject who directs the camera and corporeally experiences the space (Llamas□Rodríguez, J., 2021). The first-person point of view (POV) technique, which is functionally utilized in RPGs, further deepens this identification at a structural level. As described by Cicchirillo (2020), POV leaves no distinction between the player and the character; the character's objectives are internalized by the player, and the player's sense of self undergoes a transformation at an unconscious level. Consequently, presenting the player with a new form of action or quest activates the mechanism of ideological hailing, explained by Althusser's concept of interpellation. The player becomes an agent who is directly addressed as "you" and placed into the subject position envisioned by the system. Thus, digital games function as a dual-layered hegemonic structure that confines the player within the ideological apparatus during both cinematic cutscenes and moments of interactive gameplay.

Conclusion

The origins of cinematographic storytelling trace back to the Camera Obscura, which is based on the principle of reflecting the real world without manipulation. The process extending from this primitive optical instrument to early visual devices such as the zoetrope and kinetoscope constitutes the historical course of the effort to mechanically reproduce movement and narrative. With the invention of cinema, this effort acquired an institutional form, and the processes of recording, editing, and presenting the image to the audience determined the fundamental technical and aesthetic codes of

cinematographic language. Digitalization, however, represents the most radical turning point in this history. The integration of digital technologies into cinematographic tools has transformed technical production processes and the formal logic of storytelling. The most striking consequence of this transformation is that fundamental cinematographic concepts have become reproducible through software tools, no longer requiring a physical reality reference. Today, alongside the exponential development of artificial intelligence tools, the emerging discussion around the concept of "cameraless cinema" points to the destination of this process. The digital game, meanwhile, occupies the position of both the object and the subject of this transformation. In this context, the digital game has, on the one hand, developed itself by incorporating cinematographic narrative language and its technical codes; on the other hand, it has transformed cinema through the advancements of game technology, rendering it increasingly gamified.

The game, however, as a practice older than culture, has a history as deep-rooted as human history itself. The game, which lays the groundwork for the individual to adapt to the social, legal, and economic structures in which they live, fulfills this function largely through the storytelling it contains. The stories, whether they constitute the core narrative of games or are presented through gamification, function as a practice of transmission that leads the individual to internalize the existing socioeconomic order. From this perspective, the game emerges as a practice harboring stories that habituate individuals to their surrounding cultural and hegemonic order, educating them within that system. The most significant point of intersection between cinema and games is fueled by precisely this storytelling. In this context, the existence of a bidirectional interaction between cinema and digital games becomes evident: on the one hand, the transposition of game universes and characters, which emerged with digitalization, into cinema; on the other hand, the incorporation of game-like visual modes of transmission into cinema. In this study, this bidirectional interaction is examined along the axis of storytelling, specifically within the framework of the convergence between cinema and games during the technological production phase of contemporary digital game development. For cinematography, as an overarching narrative element, transfers the accumulated knowledge of storytelling's visualization—spanning from the past to the present, into the digital game. This transfer is materialized through the direct integration of cinematographic concepts into digital game production processes.

The most striking example of this integration is Unreal Engine. Beyond merely being a technical production infrastructure, the engine functions as an interface that carries the fundamental visual language and conceptual framework of cinematography into digital game production. In this context, Unreal Engine functions as a tool that reshapes cinema within the digital game, thereby attempting to render the interface between the two mediums invisible. In this exact sense, Unreal Engine has transformed into a platform capable of reproducing cinematographic language itself, without needing a physical reality reference. Consequently, this engine emerges as an example that blurs the boundary between cinema and the digital game at the levels of both production practice and narrative logic. However, this blurring has melded the storytelling inherent to both mediums into a common melting pot, embedding the concepts and practices of cinematic production into the game. This embedding has inevitably carried the criticisms directed at cinema into the realm of digital games as well. Criticisms asserting that cinema is an ideological apparatus, that this apparatus internalizes hegemonic values and places the spectator in a position of passive reception, now constitute a valid ground of critique for digital games too, following the integration of cinematographic narrative into game production.

Indeed, as digital games become increasingly cinematic in terms of character realism and photorealistic image generation, this transformation has simultaneously and radically altered the gameplay experience itself. The player is now confronted with a narrative world built with both game mechanics and cinematographic tools, and laden with ideological codes. This situation places the player in an ongoing mutual interaction between active and passive positions. However, this activity does not signify a genuinely free agency; rather, it denotes a restricted activity operating within the boundaries drawn by the coded architecture of the game and the ideological pattern internalized from the passive spectator position. In other words, under the illusion of acting freely, the player is actually moving within a predetermined cinematographic world of meaning. When the data examined in the study are evaluated as a whole, it comes to light that this transformation, while technologically driven, possesses a deeply ideological nature. As Table 1 and Table 2 reveal, productions that center on cinematic narrative are gaining systematic legitimacy at the industrial and cultural levels. This legitimacy also serves as concrete evidence of the internalization of Hollywood-originated narrative templates and hegemonic ideological patterns into the digital game ecosystem. The linear narrative structure, motion capture (mo-cap)

technology, and heavy use of cinematic cutscenes observed in all five productions examined in the study envelop the player in a dual-layered ideological enclosure, positioning them as both a passive spectator and an active participant. The player is equipped with the codes of hegemonic discourse through cutscenes, and then, upon taking control, acts within the boundaries of this coded world under the illusion of being a free agent. This situation can be interpreted as the classical cinematographic narrative transforming the passive spectator position, yielding it instead to the phenomenon of "interpassivity" (Fizek, 2018, p. 156)[7]. In other words, the digital game has eliminated the unilateral passivity found in traditional cinema, substituting it with a new form of passivity that gives the player a sense of freedom yet has its ideological boundaries pre-drawn. This passivity is further reinforced through cutscenes that masterfully imitate traditional cinematic language and are systematically constructed upon Hollywood storytelling mechanics. Ultimately, with structures whose temporal weight is increasingly shifting toward cutscenes, digital games have ceased to be merely a played medium. Having gained the function of a cinematographic narrative medium, the digital game stands as an heir to cinema. However, it has also transformed into a medium that assimilates cinema within itself, reconstructing it as an interactive simulation. In this process, as the subject constantly vacillates between the roles of the acting (player) and the observing (spectator), they are situated within a leisure activity where hegemonic ideology actively constructs the desired, coveted, and standardized subject through the algorithmic interaction mechanisms inherent to the game.

Particularly with the integration of generative artificial intelligence models into image production and the incorporation of "cameraless cinematography" into the realm of digital games, the question of where this process will evolve is beginning to occupy an increasingly decisive place at the center of ongoing debates from the perspectives of art and ideology. Cinema is reproducing all of its characteristic features within the digital game; thus, the boundaries between the two media are blurring at the levels of technical, viewing, and experiential practices, giving rise to a new screen phenomenon.

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7 The concept of "interpassivity", utilized by Fizek (2018) based on the theoretical framework of Robert Pfaller and Slavoj Žižek, is grounded in the relevant literature as an aesthetic and psychological phenomenon rather than a hegemonic or ideological imposition. On the other hand, Gekker (2018, p. 221) transposes this concept onto a political terrain within the context of the ideological control mechanisms of digital media.

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FROM GAME TO SCREEN: THE NARRATIVE CONSTRUCTION OF THE FALLOUT UNIVERSE AS A TELEVISION SERIES

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Introduction

Breaking out into the gaming scene with the iconic slogan "War never changes," Fallout has cultivated a dedicated audience since its debut in 1997 through its various installments. The series presents a post-apocalyptic narrative centered on a world shaped by the aftermath of nuclear devastation—one of the most catastrophic consequences of human technological advancement. In this sense, Fallout constructs a distinctly post-apocalyptic framework. However, beyond the conventions of traditional science fiction, the narrative does not foreground futuristic technological progress; rather, it draws on retro-futuristic aesthetics, reflecting imagined continuations of mid-to-late 20th-century technologies. This stylistic choice enables audiences to visually experience a world shaped by outdated yet reimagined technological forms. Consequently, the Fallout universe is most accurately defined as a post-apocalyptic role-playing game (RPG) that incorporates core elements of science fiction.

This unique and often unsettling universe—originally experienced interactively by players—was adapted into a television series in the first half of 2024 and released on Amazon Prime Video, where it attracted significant audience attention. While cinema has a much longer historical trajectory than digital games, it has profoundly influenced the development of game design in terms of lighting, camera movement, narrative structure, and character construction. Cinematography, encompassing elements such as camera angles and editing, constitutes a fundamental component of visual storytelling. Therefore, the adaptation of narrative content across moving-image media necessitates the effective use of these cinematic techniques.

This chapter analyzes the television adaptation of Fallout by focusing on its narrative construction in relation to the original game, particularly through

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character development, camera work, and the transformation of storytelling from game to screen. It aims to identify the points of convergence and divergence between these two media forms. In order to contextualize this relationship, the chapter also traces the evolution of the Fallout franchise from 1997 to the present. Both the game and the television series have cultivated dedicated audiences with similar visual and thematic elements. However, the affordances of digital media have enabled the series to adopt a more expansive and, to some extent, interactive narrative structure. Furthermore, the fragmentation and distribution of the story across different media platforms can be interpreted as a successful example of transmedia storytelling.

The Origins of Cinema and Cinematographic Elements

Elements such as synchronized sound, advanced optics, and evolving camera technologies were integrated into cinematic practice. The incorporation of these technological innovations significantly contributed to the rapid development of the film industry and enabled audiences to perceive the world in new ways. This transformation can be understood through a technological determinist perspective, as articulated by Marshall McLuhan. McLuhan argues that technological developments and the media they produce reshape human perception and cognition, effectively functioning as extensions of the human body (McLuhan, 2019). In this sense, cinema emerges as a new perceptual apparatus—a "new eye"—through which individuals experience reality. At the same time, cinema's political, social, and cultural impact on audiences has made it a significant subject of inquiry within communication and media studies. Issues such as its role as a cultural industry, its use as a tool of propaganda, and its capacity to reconstruct reality through technological means have been widely debated and continue to occupy a central place in scholarly discussions.

Cinema constructs new worlds through films, and these constructed realities influence individuals socially, artistically, and culturally through their cinematographic elements and narrative structures. Cinematography can be understood as a process of visual selection in which the filmic image is shaped by camera, editing, lighting, and color. In other words, cinematography encompasses elements such as camera angles, lighting and color, movement, and visual composition (Bordwell & Thompson, 2019).

Camera angles are crucial components that shape the audience's perception of the cinematic narrative. A low angle shot, where the camera captures an

object or subject from below, imbues the subject with a powerful, authoritative, or ethereal impact. Conversely, a high-angle shot positions the camera above the subject, aiming to evoke a sense of vulnerability and weakness. The subjective (point-of-view) angle occurs when a scene is filmed from a character's perspective, allowing the audience to perceive the narrative through the character's direct experience (Mascelli, 1998). These angles dictate through whose eyes the audience views the film; the camera may narrate the story from a character's perspective or place the viewer in the character's position (Özdemir, 2019). Consequently, camera angles shape the dramatic, aesthetic, and psychological dimensions of visual storytelling.

Similarly, lighting and color add a dramatic and realistic depth to the visual narrative, strengthening spatial perception and enabling the creation of symbolic layers of meaning. Although many filmmakers argued until the 1970s that black-and-white films were more aesthetic than color, significant experimentation with color was already underway (Monaco, 2001). Regarding lighting, the three-point lighting system—commonly used in television—is employed to enhance the volumetric appearance of characters. This system, consisting of key, fill, and backlighting, is established to create a sense of spatial depth and to reinforce the visual narrative. Furthermore, the use of color temperature and shadows bolsters the psychological impact of a scene or character. While warm tones evoke feelings of intimacy and comfort, cool tones support emotional states such as sadness, loneliness, and tension through dramatic effect (Brown, 2016). Another vital element is editing. Referred to as the post-production phase, editing involves arranging captured footage in a specific sequence and utilizing transition effects to provide the film with structural integrity. Sergei Eisenstein, a leading thinker in the field and a formalist theorist, argued that the mind must establish a narrative or unity between images. Thus, a link is forged between form and realism (Özdemir, 2009). By utilizing all these elements, a director presents a universe or a reality to the audience.

In addition to lighting, camera angles, color, and editing, another fundamental component of cinema is narrative. Together with these elements, narrative involves the construction and presentation of a story within a coherent structure—typically comprising beginning, development, and conclusion—in order to engage the audience. From a theoretical perspective, narrative refers to the study of stories and their structures, as well as their effects on

perception, cognition, and emotion. Moreover, past experiences and everyday events are continuously reconstructed in narrative form, forming the basis of content in literature, theatre, cinema, and television (Cutting, 2016).

Human beings, who have long been inclined to tell and listen to stories, established the foundations of narrative in antiquity. In *Poetics*, Aristotle analyzes narrative structure through tragedy, emphasizing key elements such as plot (*mythos*), character (*ethos*), language, spectacle, music, and the concept of catharsis (Aristoteles, 2007). Catharsis, according to Aristoteles refers to the emotional purification experienced by the audience, allowing them to confront and process their own emotions through tragic representation. He also defines art as *mimesis*, that is, the imitation of nature. Accordingly, narrative functions both as a process that evokes emotional catharsis and as an artistic practice rooted in imitation. These foundational concepts articulated by Aristotle later evolved into a systematic field of study with the development of literary theory. In the twentieth century, Vladimir Propp, through his analysis of Russian folktales, demonstrated that narratives possess systematic structures. Propp identified a model consisting of 31 narrative functions and 7 spheres of action, revealing that stories are constructed through recurring structural patterns (Patan, 2021). This perspective underscores the idea that narrative is a constructed system shaped by specific techniques, closely aligned with the structuralist tradition. Within structuralists such as Claude Lévi-Strauss, Roland Barthes, Gérard Genette, and Tzvetan Todorov conceptualize narrative as a systematic process. According to structuralist thought, meaning does not arise from isolated content but from the relationships among elements within a structured system. Similarly, Genette argues that what determines meaning in a narrative is not the events themselves but their arrangement and positioning within the narrative discourse. Thus, narrative analysis should focus less on "what is told" and more on "how it is told" (Genette, 1980). Barthes, on the other hand, conceptualizes narrative as a structure composed of signs. Through symbolic, semic, and cultural codes, he situates narrative within a multi-layered process of meaning production rather than a linear story. Importantly, Barthes extends this analysis beyond literary texts to include visual media such as cinema and television. In this context, elements such as editing, lighting, and camera angles become integral to the production of narrative meaning (Barthes, 1996).

Meaning, therefore, emerges through a holistic process that integrates cinematographic elements into a unified structure. The viewer, by incorporating

their own experiences, actively reinterprets the films they watch, thereby continuing the process of meaning-making initiated by cinema. In this sense, the viewer becomes a co-creator of the text. Particularly in the twenty-first century, digital games have adopted many of cinema's core mechanisms of meaning production. As a result, these two media forms have entered a dynamic and interactive relationship, continuing to coexist and influence one another within the broader landscape of digital media.

Digital Games and The Evolution of Storytelling

Digital games are interactive forms of entertainment that emerged alongside the advancements in computer technology (Natkin, 2006; Ritterfeld & Weber, 2010). However, a defining characteristic that distinguishes digital games from traditional games is their capacity for storytelling (Cassidy, 2011; Meakin, 2024; Shapiro et al., 2010)—a feature that has been instrumental in their historical development and contemporary popularity. Early digital games, such as *Pong* (Atari, 1972) which functioned as a rudimentary abstraction of tennis—aimed primarily to provide entertainment, largely due to the prevailing technical constraints of the era (Byrne, 2016). The inception of storytelling in gaming is attributed to the digital adaptation of role-playing games (RPGs) and "choose your own adventure" style narratives. Early examples, such as *Colossal Cave Adventure* (Crowther, 1976), *Zork* (Infocom, 1977), and *Adventureland* (Adventure International, 1978), were text-based digital games where players interacted by inputting simple commands into their computers. Subsequent titles like *Mystery House* (On-Line Systems, 1980) and *Rogue* (Epyx, 1980) aimed to provide a more holistic experience by integrating basic graphics into the text-based gameplay.

Cinematic storytelling in digital games became possible through the introduction of cutscenes—also known as cinematics—which momentarily suspend player control, transitioning the user into the role of a passive observer. Various games found innovative ways to incorporate visuals into their narratives. One of the earliest educational games, *The Sumerian Game* (Addis & McKay, 1964), developed as a joint research project between the New York State educational agency BOCES and IBM, utilizing synchronized images projected via a slide projector to accompany its text-based resource management gameplay (Willaert, 2019).



Figure 1: *Visual representation of The Sumerian Game (as cited in Willaert, 2019).*

By the 1980s, digital games began forging stronger connections with cinema. In Dragon's Lair (Advanced Microcomputer Systems, 1983), players controlled an animated film utilizing FMV (Full Motion Video) technology, which would gain further popularity in the 1990s. The game's animation was produced by Don Bluth, a former Disney employee. Similarly, Astron Belt (Sega, 1983) constituted an arcade game created by overlaying real-time 2D graphics onto FMV footage. Another instance where digital games and cinema intersected during the 1980s was E.T. the Extra-Terrestrial (Atari, 1982), a game often associated with the North American video game market crash. Developed as an adaptation of the film of the same name, the game received poor reviews upon release and resulted in a significant commercial failure (Montfort & Bogost, 2009).

By the 1990s, storytelling and cinematic elements had become indispensable attributes of digital games. Numerous adventures and role-playing games released during this period distinguished themselves through their narrative achievements. One such game is Fallout: A Post Nuclear Role-Playing Game, published by Interplay in 1997.

Storytelling in Fallout

Fallout is a post-apocalyptic role-playing game created by Tim Cain. Set in a world rendered uninhabitable following a global-scale nuclear war between the United States and China during the 22nd century, Fallout draws references from numerous historical and contemporary subjects. While the futurism of the 1950s and atomic age design aesthetics constitute the fundamental visual identity of the Fallout universe (Gökalp, 2025; Barton, 2008), the Red Scare of the Cold War era, McCarthyism, and Hyper-capitalism form the primary plane of political discourse within the fictional universe. Nevertheless, there are points where the games within the series exhibit narrative

divergence. At this juncture, examining the narrative of the Fallout universe within a historical framework alongside the series' developmental trajectory will prove more illuminating.

The Interplay Era

The origins of the Fallout universe can be traced to the game Wasteland (Electronic Arts, 1988). Set in a post-nuclear apocalypse similarly to Fallout, director Brian Fargo's desire to develop a sequel under the Interplay umbrella, coupled with the inability to acquire the intellectual property rights for that game, led to the creation of Fallout. The team, led by Tim Cain, designed the Fallout universe during their spare time with a small group, drawing primary inspiration for their post-apocalyptic narrative from films such as Mad Max (G. Miller, 1979) and A Boy and His Dog (Jones, 1975), as well as the novel Canticle for Leibowitz (W. M. Miller, 2019). Furthermore, Fallout's distinctive retro futuristic design language emerged from inspiration drawn from Forbidden Planet (Wilcox, 1956), atomic age designs, and Cold War-era propaganda posters (Tieryas, 2020).



Figure 2: *The opening cinematic of Fallout (Interplay, 1997) depicting a cityscape ravaged by nuclear apocalypse, with 1950 s-inspired newsreels and advertisements visible in the foreground, accompanied by The Inkspots' 1940 song "Maybe."*

Fallout, developed within Interplay, and its sequel Fallout 2 (Black Isle Studios, 1998), developed by Black Isle Studios, exhibits differences in gameplay, tone, and narrative language. Primarily, unlike subsequent games in the series, the first two titles are role-playing games played from an isometric perspective with turn-based mechanics. However, as the series is generally acclaimed for, these games are distinguished by their branching narrative structure, the diversity of role-playing options afforded to players, and the multiple pathways available for accomplishing quests.



Figure 1: A character dialogue scene from Fallout.

Moreover, one of the most striking aesthetic decisions in the Interplay-era Fallout games was the creation of the "talking head" characters visible in the dialogue system using animations produced from clay sculptures. Animations produced through this method emerge as significant elements of the original Fallout games' distinctive visual language, concretizing the game's physically challenging, raw, and brutal atmosphere.

Although the Fallout games released during the Interplay era were well-received by critics and players alike, the series began to lose momentum in the early 2000s due to the company's financial difficulties, managerial crises, and the release of generally poorly received spin-off titles bearing the Fallout name: Fallout: Tactics (Micro Forte, 2001) and Fallout: Brotherhood of Steel (Interplay, 2004) (Burnes, 2004). During this period, the game being developed under the codename Van Buren, intended to be Fallout 3 in the main series, was cancelled.

Bethesda's Acquisition of Fallout: Fallout 3 and Fallout New Vegas

Interplay's financial troubles led to the sale of Fallout intellectual property to Bethesda Softworks in 2004 (Burnes, 2004). Following the transfer of Fallout's ownership, Bethesda commenced development on a new installment in the series, releasing Fallout 3 in 2008. The new game, bearing the DNA of The Elder Scrolls series—to which the developers owed their renown—contained fundamental differences from the Interplay-era Fallout games.



Figure 4: *The moment the player first experiences the Capital Wasteland in Fallout 3 (Bethesda, 2008).*

The first and most evident of these differences was the transformation of the game's isometric, turn-based gameplay into a first/third-person shooter role-playing game allowing perspective switching. This change undoubtedly also altered the game's visual presentation style and narrative approach. Bethesda's game design philosophy, which permits in-game physical interactions and emphasizes player-led exploration of the game map at their own pace, mutated the Fallout universe in alignment with the open-ended storytelling characteristics of the Interplay era. Set in the barren and dangerous Capital Wasteland, formed by the destruction of Washington D.C. and its surroundings, Fallout 3 was also the first game in the series to take place on the East Coast. This situation would be reinforced by future games, giving rise to an informal distinction within the series between East Coast Fallout (Fallout 3, Fallout 4, and Fallout 76) and West Coast Fallout (Fallout 1, Fallout 2, and Fallout New Vegas), denoting two separate styles, narrative languages, and design philosophies. The compatibility of the Bethesda formula with the Fallout universe rendered Fallout 3 a successful game in the eyes of critics and players (McLaughlin & Kaiser, 2010; Metacritic, 2026), increasing the fictional universe's cultural footprint by introducing it to new generations and audiences as the 2010s approached.

Following the release of Fallout 3, development on a new Fallout game commenced at Obsidian Entertainment, founded by developers of Fallout 1 and 2. This game, titled Fallout: New Vegas (Obsidian, 2010), was developed using Bethesda's game engine and assets, adopting the style of Fallout 3 but incorporating the tone, narrative style, and themes of the original Fallout games. Utilizing narrative elements, characters, and factions from the cancelled Van Buren project, the game represents a fusion of the two distinct Fallout styles (Dransfield, 2019). With its strong political themes, memorable characters, and immersive depiction of the relentless struggle between

the New California Republic (NCR), Caesar's Legion, and Mr. House, it has secured a significant place in the esteem of fans.

Contemporary Fallout: Fallout 4 and Fallout 76

The most recent installment in the main series, Fallout 4 (Bethesda, 2015), was released in 2015. Developed by Bethesda, the game is set this time in the Commonwealth region surrounding Boston. In Fallout 4, which features a simplified dialogue system compared to other games in the series and a narrative approach moving closer to a cinematic style, the traditionally silent protagonist is replaced by a voiced main character for the first time. Furthermore, a base-building and management mechanic, harmonious with the game's post-apocalyptic narrative, was among the new mechanics introduced. These changes in gameplay and presentation style stand out as one of the most profound shifts in storytelling within the main series. While continuing Bethesda's tradition of exploration-based gameplay and environmental storytelling, the game differs by offering a more constrained dialogue system and addressing themes distinct from previous instalments. In this respect, Fallout 4 emerges as the game initiating a new phase in the series' narrative evolution.



Figure 6: *Fallout 4's simplified dialogue interface.*

Following *Fallout 4*, Bethesda announced a multiplayer online *Fallout* project and subsequently released *Fallout 76* (Bethesda, 2018) in 2018. As the first multiplayer installment in the franchise, the launch of *Fallout 76* was met with negative reception due to technical issues and the absence of non-player characters (NPCs) available for interaction (Nielsen, 2018; Tyrrel, 2018; Yin-Poole, 2018). In this regard, it is observed that the game's structure—which previously prioritized dialogue and narrative storytelling—underwent a transformation, shifting away from its offline role-playing roots and transitioning toward a live-service model aimed at long-term gameplay.

Nevertheless, the game's unsuccessful launch prompted Bethesda to reintroduce human NPCs and revert to a silent protagonist dialogue system through the expansion pack titled *Wastelanders*.

Fallout As A Transmedia Narrative: The Amazon Fallout Series (2024)

Since the 1990s, a reciprocal interaction has emerged between cinema and digital games in terms of editing, narrative structures, color usage, and point of view. This interaction has led to significant transformations in the narrative forms of both media, enabling the development of more complex, multilayered, and interactive storytelling structures.

Within this process, films adapted from digital games have transferred the distinctive atmosphere and experiential qualities of games into cinematic form. At the same time, digital game production has increasingly incorporated cinematic techniques, particularly cinematography and dramatic structure—into its design. Consequently, a strong convergence has developed between these two media forms not only at the thematic level but also in terms of form and aesthetics.

This interaction has been conceptualized as transmedia storytelling. According to Henry Jenkins, transmedia storytelling refers to a process in which different components of a narrative are distributed across multiple media platforms, with each medium contributing uniquely to the overall story (Jenkins, 2016). In this model, a story may be introduced in a film and subsequently expanded through television series, novels, or digital games. Similarly, Scolari emphasizes that narratives in transmedia contexts are dispersed across digital platforms and remain open to user participation. For Scolari, transmedia storytelling operates as a participatory ecosystem in which meaning is largely co-produced by users and audiences (Scolari, 2009).

The Narrative of The Fallout Television Series (2024)

The Fallout, released on Amazon Prime Video in 2024, received considerable acclaim with its first season and was subsequently renewed for a second season (2025–2026). Based on the video game series of the same name, the narrative takes place in a post-apocalyptic America following nuclear devastation. The story centers on the main character, Lucy MacLean, who was born and raised in Vault 33. Her journey revolves around her attempt to understand the outside world and survive within it. After her father is abducted from the vault, Lucy ventures into the wasteland in search of him, only to discover that the external world is far more dangerous and unpredictable than she had imagined.

Accompanying Lucy on this journey is another central character, The Ghoul. Forced to use medication to prevent himself from turning into a feral creature, The Ghoul is revealed—through flashbacks—to have been Cooper Howard, a famous Hollywood actor before the nuclear catastrophe. While initially portrayed as a morally grounded figure attempting to prevent global conflict, particularly in contrast to his wife Barb Howard, his prolonged survival in the post-apocalyptic world for over two centuries transforms him into an anti-hero willing to do whatever is necessary to endure.

The central theme of the series, much like the game, is encapsulated in the slogan "War never changes." This phrase reflects the persistent and destructive tendencies of humanity, suggesting an inherent inclination toward violence and self-destruction. Within the Fallout universe, destruction becomes normalized, and survival emerges as the primary governing principle.

Both the television series and the game franchise can be considered significant examples of transmedia storytelling. By presenting the same narrative universe across different platforms, they move beyond traditional linear storytelling. In line with Jenkins' definition, different segments of the story are conveyed through distinct media, each utilizing its own formal and narrative affordances. Furthermore, the series introduces new characters and expands the backstories associated with them, thereby enriching the overall narrative world.

Retro-futuristic elements are prominent in both the game and the series. Notably, the absence of transistor technology within this fictional universe results in the depiction of large, analog devices. Although the vehicles appear technologically advanced compared to those of the contemporary world, their design evokes the aesthetic of 1950s automobiles. Additionally, references to the Cold War era, reinforced through period-specific music, contribute to a nostalgic yet dystopian vision of the future.

The narrative structure of the Fallout series employs flashback techniques to provide in-depth character development, thereby establishing a strong connection with the audience. While maintaining ties to the game's narrative universe, the series constructs an independent and original narrative framework. Consequently, it appeals not only to fans of the game franchise but also to broader audiences unfamiliar with gaming culture. This inclusive narrative structure constitutes one of the primary reasons for examining the series within an academic context. Moreover, television narratives draw extensively on the aesthetic and narrative traditions of cinema in constructing

their storytelling language. In this context, while preserving the thematic foundations inherited from the game, the series reconstructs its post-apocalyptic universe through cinematographic elements such as camera angles, color schemes, and editing techniques. This process highlights the aesthetic and narrative convergence between different media forms.

Structural Analysis of The First Season of The Fallout Series

This section provides a structural analysis of the first season, beginning with an examination of the primary characters. In television productions, the comprehensive introduction of characters' historical backgrounds, as well as their psychological and social attributes, is essential for establishing an emotional resonance between the audience and the narrative. Consequently, the analysis first addresses the pivotal figures within the first season's arc. Furthermore, the predominant use of camera angles, lighting, and sound design throughout the season is evaluated to understand how these elements coalesce with recurring symbols to construct the series' unique narrative discourse.

The inaugural episode of the eight-part series, titled "The End," introduces Cooper Howard as he performs a cowboy routine to entertain children at a birthday party. This domestic scene is abruptly shattered by a series of nuclear detonations, triggering a chaotic exodus. The narrative then transitions 219 years into the future to Vault 33, where the second protagonist, Lucy MacLean, is introduced as she presents her credentials to the Vault overseers for marriage eligibility. While Lucy prepares to marry an inhabitant of Vault 32, it is revealed that the neighboring vault has been infiltrated by raiders. The ensuing confrontation results in the massacre of Vault 33 residents and the abduction of Lucy's father. Driven by the objective of rescuing him, Lucy makes the pivotal decision to venture onto the surface world.

Lucy MacLean: Lucy's primary narrative arc commences with her departure from the vault to the surface world in search of her father. Raised within the secluded and protected environment of the vault, Lucy is characterized by her civility and a strong inclination toward social interaction, albeit marked by a degree of loquacity. Having lost her mother, she maintains a profound emotional bond with her father, who serves as her primary moral compass. In the second episode, titled "The Target," Dr. Siggi Wilzig provides a pivotal thematic foreshadowing by stating, "If you want to stay in this lawless world, you must adapt." This sentiment establishes the trajectory for the remainder of the first season and the subsequent narrative, focusing on Lucy's arduous

transition into a chaotic and morally ambiguous reality. By the fourth episode, "The Ghoul," the character begins to realize that survival in this hostile environment necessitates resilience and a capacity for violence. Critical moments—such as being forced to consume irradiated water and the act of severing The Ghoul's finger during an escape attempt—serve as significant semiotic markers, signaling the character's radical evolution from a sheltered idealist to a hardened survivor.

Cooper Howard (The Ghoul): Prior to the nuclear cataclysm, Cooper Howard—often labeled a "Crypto-Communist" by his contemporaries—was a renowned film star who eventually found himself relegated to performing at children's birthday parties for sustenance. The inaugural episode introduces Howard through such a celebratory setting, immediately juxtaposing his former prestige with his diminished social standing. The narrative then shifts to his re-emergence as "The Ghoul," when a group of bounty hunters exhume him from a grave, thereby establishing his post-apocalyptic identity. The bounty hunters' derisive query—"Is the 'baddest of the bad' we're looking for just a miserable mutant?"—functions as a significant narrative plant, foreshadowing his formidable reputation in subsequent episodes. The construction of this character relies heavily on the frequent use of flashbacks within the narrative structure. These temporal shifts serve to underscore that, in his pre-war existence, Howard was a virtuous, just, and inquisitive individual deeply devoted to his family. His primary motivation remains the restoration of his familial unit. In the third episode, titled "The Head," his inherent sense of justice and composure is further highlighted; during a film production, his questioning of the director—"Do we really have to kill them?"—stands in stark contrast to the ruthless pragmatism of his future persona. This deliberate narrative layering emphasizes the radical psychological and moral transformation forced upon him by the wasteland.

In the later episodes of the Fallout, the narrative brings the two central characters into direct interaction, constructing their relationship through a tension grounded in the binary opposition of good and evil. This dynamic is further enriched by the incorporation of dark humor, which functions as a narrative strategy to mediate the bleakness of the post-apocalyptic setting and enhance audience engagement

Maximus: A soldier of the Brotherhood of Steel, is introduced as a survivor of the nuclear catastrophe. Raised within the hierarchical and militaristic structure of the Brotherhood, his formative years are shaped by discipline

and indoctrination. However, his narrative arc evolves into a form of resistance against this institutional authority. Characterized by emotional fluctuations and moral ambiguity, Maximus is portrayed as a somewhat naïve and childlike soldier, whose development reflects an ongoing tension between obedience and individual agency.

Hank McLean: Hank, on the other hand, is initially presented as a devoted father and a competent leader within the vault community prior to his abduction. His character is constructed through dialogue in a way that gradually introduces ambiguity, raising doubts about his true nature. As the narrative unfolds, particularly using flashback sequences, it is revealed that Hank was responsible for the nuclear destruction of the Shady Sands settlement, where his wife resided. This revelation reconfigures his character from a seemingly benevolent figure into a morally complex and ethically compromised individual.

In the Fallout, close-up shots are frequently employed to convey the emotional states of the characters, thereby establishing an intimate connection between the viewer and the narrative. In particular, Lucy's expressions of shock and disgust—triggered by her encounters with zombies, mutated creatures, and other grotesque elements of the wasteland—are effectively communicated through close-up facial shots. This technique allows the audience to directly engage with her subjective experience and emotional responses. To depict the diverse settings and atmospheric conditions within the narrative, establishing shots are consistently utilized. Each transition to a new location is introduced through an opening shot that situates the viewer within the spatial context of the scene. This conventional cinematic technique, widely used in both film and television, functions as a visual tool for orienting the audience and reinforcing the narrative's spatial continuity.

In addition to camera techniques, lighting plays a significant role in constructing the visual environment. In particular, the use of artificial lighting in vault scenes contributes to the creation of an almost surreal and controlled atmosphere, distinguishing these spaces from the chaotic and hostile conditions of the surface world. Furthermore, transitions between the vault and the outside environment are often accompanied by nostalgic musical selections from the 1950s, including works by Johnny Cash. This juxtaposition of retro music with a post-apocalyptic setting evokes a sense of nostalgia, reinforcing the series' retro-futuristic aesthetic and its thematic engagement with longing for the past.

In the final episode of the first season, Lucy ultimately locates her father, Hank MacLean, who is being held captive in a cage by Moldaver. Through this confrontation, Lucy learns the truth about her father's past. It is revealed that the Vault-Tec corporation, along with Hank himself, played a central role in orchestrating the catastrophic events that led to the nuclear devastation. In the same episode, it is also disclosed that Barb Howard, the wife of Cooper Howard, was implicated in the origins of the nuclear conflict. Within this context, the iconic slogan of the Fallout—"War never changes"—is recontextualized and gains renewed significance, particularly through Barb's dialogue, which underscores the persistence of human-driven destruction.

"This is our chance to make war obsolete. Because in our current societal configuration, which took shape without intentional guidance, we have friction. We have conflict, and we have war. and war, well... War never changes"

The scene in which Lucy learns the truth about her father is presented in parallel with the scene in which Cooper Howard listens to Barb and comes to understand reality through her words. These two sequences are connected through parallel editing (cross-cutting), a technique that enables viewers to establish a meaningful relationship between temporally distinct yet thematically linked events. By juxtaposing these scenes, the narrative encourages the audience to engage in interpretive work, reinforcing the emotional and thematic resonance of both moments. As such, this technique represents a significant form of editing commonly employed in classical cinema. The Fallout constructs a new and compelling television narrative by adapting a segment of the Fallout storyline and rearticulating it through cinematic elements. By integrating narrative, cinematography, and editing techniques, the series successfully translates the game's universe into a coherent audiovisual experience. According to Nielsen data, the series premiered on the platform in the United States in April 2024 and accumulated approximately 2.9 billion minutes of viewing within its first few days. Over the remainder of the year, total viewership reached approximately 12 billion minutes, positioning Fallout as the fifth most-watched original series of 2024 (Nielsen, 2024).

Conclusion

Digital games, which initially emerged in the 1980s primarily as tools for entertainment, have evolved into complex narrative environments that in-

corporate sophisticated storytelling structures and cinematographic techniques. Contemporary games construct immersive and distinctive worlds, drawing extensively on visual media to enhance the representation of reality. In this context, the collaboration between the gaming industry and visual media has become increasingly significant, with the Fallout franchise and its adaptation into the Fallout standing out as one of the most notable examples in recent years.

The Fallout game series demonstrates its innovative character through elements such as stylized character design, interactive dialogue systems, and an open-ended narrative structure that enables player agency. These features not only highlight the game's interactivity but also reveal its dynamic relationship with other media forms. The open-ended nature of its storytelling further distinguishes it as a participatory narrative experience, allowing users to actively engage in meaning-making processes.

The interaction between cinema and digital games can be traced back to early examples such as Tron, one of the first films to draw inspiration from game aesthetics. Since then, numerous films have either been inspired by or directly adapted from video games, including WarGames and Doom. However, in the twenty-first century, there has been a noticeable shift from traditional cinema to digital platforms. This transformation can largely be attributed to subscription-based models and the ease with which audiences can access diverse content. As a result, digital screens and platform-specific productions have become central to contemporary viewing practices.

The Fallout television adaptation exemplifies this shift by utilizing a digital streaming platform, Amazon Prime Video, to expand the narrative universe of the game. The series introduces new characters and storylines not present in the original game, thereby enriching the narrative world. At the same time, the game and the series function as complementary components within a transmedia storytelling framework, where each medium contributes uniquely to the overarching narrative. The series further strengthens its storytelling through the use of cinematic techniques such as lighting, camera angles, and editing, particularly in the depiction of key locations such as Vault 33, Shady Sands, cemeteries, and the Griffith Observatory. These techniques facilitate the inclusion of audiences who may not be familiar with the game, broadening the accessibility of the narrative universe. Moreover, the use of flashbacks plays a crucial role in character development, enabling the

audience to engage with multiple temporal layers simultaneously. This narrative strategy not only complements linear storytelling but also enhances interpretive depth by allowing viewers to reconstruct character motivations and histories. In this regard, the series effectively bridges the gap between interactive and non-interactive media forms.

As a successful example of transmedia storytelling, the series also mobilizes fan culture as an integral component of its narrative ecosystem. Fan-generated content on platforms such as YouTube, alongside official websites and fan communities, provides additional layers of engagement for audiences seeking to explore the story world in greater depth.

In conclusion, cinema has historically interacted with a wide range of media forms, including television and digital games, continuously evolving through both technical and narrative exchanges. These media forms not only draw inspiration from one another but also contribute to the creation of immersive narrative worlds that captivate audiences and stimulate their imagination. The case of Fallout demonstrates that this ongoing convergence will continue to shape the future of storytelling across media platforms.

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THE EMBODIMENT OF THE SCREEN: WEARABLE TECHNOLOGIES AND BIO-DIGITAL INTERFACES

Aybiçe ŞAHİNLER[1]

Introduction

Within the traditional media landscape, broadcasting practices have been shaped by television's dominance among mass media. For a long time, television held the top position in terms of reach and influence; broadcasting, on the other hand, was defined as a passive form of consumption in which content is presented to the audience through a one-way flow, leaving the audience with no opportunity to interact with the content. In this traditional structure, the boundaries of broadcasting were clearly defined, and the audience was positioned as a consumer. However, with the spread of digitalization and internet technologies, television broadcasting has moved beyond its core functions and adopted a hybrid structure. Today, television is no longer merely a receiver; it has become a dynamic platform that connects to the internet, functions as a radio, and displays visual content from mobile devices such as tablets and phones (Bolat, 2021). This technological convergence has fundamentally reshaped the passive viewer structure characteristic of traditional media, shifting the viewer into a participatory role. In this new era, the viewer has transformed into an active subject who not only consumes content but also intervenes in it, shares it, and becomes an integral part of the broadcast.

The most radical change in broadcasting practices brought about by the digitalization process is visible in the perception of time and space. The constraints of time and space, which were defining elements of traditional broadcasting, are being replaced by fluid time and virtual spaces (Çakın & Bolat, 2018, p. 176). Publishing has evolved from an activity limited to a physical space or a fixed time frame into a structure that is independent of space, fluid, and ready for embodiment, thanks to the flexibility provided by the internet and digital platforms.

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With the emergence of personal computers (PCs) in the 1980s, the computer evolved from a tool requiring specialized expertise into an indispensable part of daily life and communication. Initially positioned in the business world with a focus on speed and efficiency, this technology has gradually evolved into a tool for personal needs and entertainment. However, the traditional trio of screen, mouse, and keyboard—long considered the standard—is now criticized for keeping the computer isolated within a space and detached from the user. Modern human-computer interaction (HCI) research aims to overcome this physical and spatial isolation; to make the computer a direct, transparent, and integrated part of human life and actions (Altın, 2016, p. 56). Efforts to overcome spatial isolation, combined with the digitalization and fluidity of broadcasting practices, have paved the way for the screen to move beyond its role as an external viewing surface and enter a process of embodiment.

In this context, this study examines the integration of screens from physical space into the human body —amidst a technological evolution where hardware is becoming increasingly smaller and interfaces are becoming more transparent— on both phenomenological and conceptual levels. The primary objective is to reveal how wearable technologies and bio-digital interfaces are reshaping broadcasting practices, and how bodily senses position themselves in relation to visual and auditory information. While the vast majority of current academic studies remain focused on mobile screens, smartwatches, and user experience, this study contributes to the literature by focusing on the post-screen era, where the screen has completely disappeared and become integrated into the body. The study's unique value lies in its interdisciplinary approach, which moves publishing beyond a traditional definition of content production and integrates it with cybernetics and biotechnology. In particular, the fact that technologies long featured in science fiction narratives have now become commercially available products proves the importance of discussing this new communication regime within an academic framework. In light of this importance and necessity, this study seeks to answer the following fundamental questions:

How are digitalization and miniaturization of hardware transforming traditional publishing practices in terms of spatial and temporal dimensions?

What types of interaction models do wearable technologies and bio-digital interfaces offer between the user and content in publishing processes?

In the context of the process of screen embodiment, how is the relationship between the traditional screen and the human body constructed?

What are the effects of new-generation interfaces (retinal, auditory, projectional) on the transmission and experience of media?

Building its theoretical framework on Don-Ihde's "embodiment relations," this study offers a qualitative analysis by referring to the concepts of "ubiquitous computing," "spatial computing," and Bolter & Grusin's "immediacy." The study includes four distinct technological case studies: *Apple Vision Pro* as an example of spatial broadcasting and the infinite canvas; *Mojo Vision* smart lenses as an example of retinal interfaces and invisible screens; *Bose Frames/Ray-Ban Meta* in the context of auditory augmented reality and spatial narrative; and the *Humane AI Pin*, which transforms the body into a projection surface.

Phenomenology of Technics and Embodiment Relations

In his book *Technology and the Lifeworld: From Garden to Earth* (1990), in which he systematized his post-phenomenological approach, Don Ihde conceptualized the complex relationships between humans, technology, and the world by distancing himself from classical phenomenology. Ihde's theoretical framework is based particularly on the theories of Heidegger, Husserl and praxis and perception concepts developed by Merleau-Ponty (Öngören, 2020, p. 26). The concept of "embodiment relations" discussed in the chapter titled *A Phenomenology of Technics* represents an interaction model in which technology becomes an extension of the body, integrating into perceptual processes, and the subject experiences the world through technology. To understand this structure constructed by Ihde through embodiment relations, it is first necessary to address the concepts in Maurice Merleau-Ponty's phenomenology of perception and the body.

Maurice Merleau-Ponty's philosophy holds a central place among embodiment theories by offering a critical perspective on traditional epistemological approach based on the subject-object distinction and the mind-body opposition of Cartesian dualism. The philosopher has reimagined the relationship between humans and the world, as well as the processes of thought, not as a structure isolated from the body, but through a body-centered phenomenological perspective. The phenomenology of embodiment, by treating human existence in the world as an integrated bodily reality encompassing all life conditions, provides a fundamental theoretical framework for contemporary ontological debates and the definition of consciousness processes (Aydın, 2020, pp. 79, 80). Cognitive processes do not merely constitute a

data-processing practice in which data from the external world is transformed into a mental representation; rather, they emerge as an existential experience that forms a unity with the subject's bodily presence in the world.

For Merleau-Ponty, perception links consciousness to the world through an intentional relationship. This relationship is not a distance separating the subject from the object, but rather a bodily unity established through the intentional arc. At this point, Merleau-Ponty redefines intentionality not as a mental or internal process, but as the body's existential positioning in the world (Aydın, 2020, p. 80). Intentionality, in Carman's words, "is not a mental state or a property of the mind, but rather the thing that directs us toward the world, unites us with it, and binds us to it" (2008, p. 32).

Merleau-Ponty's early approach to technology, presented in his work *Phenomenology of Perception*, focuses on five specific technological artifacts: a fur hat, a car, a blind man's cane, a typewriter, and an organ (Latour, 1999; Ihde & Selinger, 2004).

> Once the stick has become a familiar instrument, the world of feelable things recedes and now begins, not at the outer skin of the hand, but at the end of the stick… the stick is no longer an object perceived by a blind man, but an instrument with which he perceives. It is a bodily auxiliary, an extension of the bodily synthesis (Merleau-Ponty, 2002, pp. 175, 176).

Merleau-Ponty's idea of bodily synthesis and the transparency of the tool as it becomes integrated into the body served as a starting point for Don Ihde, the founder of post-phenomenology. Ihde focuses this approach—built upon Merleau-Ponty's bodily foundations—on the interface of interaction between the subject and the world. "…this interconnection of embodied being and the surrounding world—what happens at the interface is what matters. At least that is how a phenomenological perspective takes shape" (Ihde, 2002, p. 8). Ihde's emphasis positions technology not merely as an external tool, but as a dynamic component at the center of the body's connection with the world. This interface-focused perspective leads to the concept of embodied relationships, which Ihde describes as the most direct form of relationship established with technology.

Don Ihde has defined our relationship with technology within a post-phenomenological framework not as a practice of use, but as an existential bond with the world. Although modern science has relied on optical technologies

to conceptualize the world from a new perspective, the process of embodiment in humans is far more profound and widespread than this scientific advancement. According to Ihde, the way a person enacts their praxis (activity) through technologies is, at its core, part of the way the world is experienced. In this context, visual techniques occupy a central position within the intentionality of seeing, as framed by phenomenological relativity. This concept, which the philosopher terms "relationships of embodiment," refers to the inclusion of technology in the experiential process through a reflexive transformation of sensory and bodily perceptions. Seeing the world through a human-made lens creates a different perceptual dimension from the experience of seeing with the naked eye, even if the influence of the visual aid is minimal (Ihde, 2020, pp. 28, 29).

$$(I - \text{technology}) \rightarrow \text{world}$$

In this relationship, technology has ceased to be merely the object of perception and has become a medium through which the world itself is perceived. The subject deeply integrates technology into their own process of experience; technology and the body begin to function as a single perceptual unit that jointly engages with the world.

Don Ihde defines embodiment relations through the process of technology acquiring a completely transparent quality during its use. When a technology or tool is learned and becomes a bodily habit, it ceases to be an object of perception and becomes a direct part of perception. As in the example of glasses presented by Ihde, as glasses become integrated into the user's way of experiencing their surroundings, they withdraw from the foreground and move into a nearly imperceptible position. At this stage, the visual technology has taken on the form of a dynamic symbiosis established between the object and the user's action (Ihde, 2020, pp. 28, 29). This symbiotic relationship is expressed by the following formula, which describes how technology is directly integrated into the subject's way of perceiving the world:

$$(I - \text{glasses}) - \text{world}$$

In this formula, the conjunction in parentheses represents the perceptual transparency that allows the technology to become an integral part of the subject, enabling them to perceive the world with immediacy. Thus, the glasses cease to be an object to be looked at and transform into the primary instrument for perceiving the world, playing an active role in the user's bodily synthesis. Ihde positions the example of glasses beyond merely being a tool that corrects visual impairments and restores perception to its normal

state. While a standard lens aims to restore vision to normal, technological interventions such as colored or polarized lenses open up a complementary way by fundamentally altering how we perceive the world. This demonstrates that technology is not merely a prosthesis that compensates for a deficiency, but an artificial yet transformative power that reshapes how we perceive the world and ourselves (2020, p. 48).

Ihde speaks of a deep desire that emerges in the experience of embodied relations. This desire, on the one hand, seeks technology to become completely transparent, to embody itself, and to become a total self. However, Ihde draws attention to a phenomenological limit here. If this were to occur, it would mean that technology would cease to exist. For a completely transparent technology would not create a sensation distinct from the body and perception itself and would lose its technological character (2020, pp. 31, 67).

In the relationship between the body and technology, the transparency of technology is not an absolute disappearance but a perceptual hierarchy. Ihde has explained this situation through the use of glasses, citing the tension between focal perception and peripheral phenomena. Focally, the user's perceptual experience finds its target (the world) through the lenses, and technology itself becomes invisible in this process. Simultaneously, the user is aware of the physical contact of the glasses on the bridge of the nose or the ears as a peripheral phenomenon. Despite this peripheral awareness, the embodiment relation functions perfectly as long as the technology exhibits a capacity for transparency (Ihde, 2020, p. 52). Even in cases where embodiment is extreme, technology's presence as a background can still be detected; for there is always a variable ratio between technology's objectivity and its transparency in use.

Immediacy In Broadcasting and Transparent Interfaces

To understand the cultural logic of wearable technologies and embodied interfaces, a foundational theory is needed to explain the origins and operational mechanisms of digital media. Jay David Bolter and Richard Grusin's book *Remediation: Understanding New Media* has provided one of the most influential theoretical frameworks in this field. With the title of their 1999 work, Bolter and Grusin reference Marshall McLuhan's 1964 book *Understanding Media: The Extensions of Man* (FutureLearn, n.d.). The authors aim to reinterpret McLuhan's media theories by updating them to meet the demands of the digital age.

According to Bolter and Grusin, communication media have historically gone through a process known as "remediation". Although the authors avoid defining remediation as a universal or normative law of media, they argue that this phenomenon is a historical process that has persisted in the Western world since the Renaissance. This process consists of a dialectic between two opposing cultural logics: transparency and hypermediacy (Bonnet, 2002). Bolter and Grusin conceptualize the history of Western media as an effort to achieve complete integration with the represented reality by concealing the medium's own existence from the audience. In this historical process spanning from Renaissance painting to virtual reality, the ultimate goal of this quest—which aims to achieve a flawless logic of transparency by erasing all technological intermediaries from brushstrokes to pixels—is a utopian state of immediacy in which the individual, freed from the medium that limits perception, merges directly with the object they experience (Bonnet, 2002). According to Bolter & Grusin, transparent immediacy is a style of visual representation whose primary goal is to make the viewer forget the medium's existence and feel as though they are in the presence of the represented objects. At this point, the medium no longer functions as a barrier but as a transparent window opening directly onto reality (1999, pp. 21, 25).

According to Bolter & Grusin, digital visual media can best be understood through the ways in which they honor, rival, revise painting, photography, film, and television. What is new about new media stems from the way it reshapes (refashioning) older media and the ways in which older media adapt to respond to the challenges posed by new media (1999, p. 15). In this sense, technological progress is a process of remedy. In this process, each new medium aims to eliminate the invisible mediating forms that limit perception by exposing the shortcomings of its predecessor regarding transparency. Film, which transcends the static nature of photography, and virtual reality, which breaks the limited perspective of film, are historical steps toward achieving this utopia of transparency (Bonnet, 2002). This historical movement towards the utopia of transparency is lifting humanity from the two-dimensional surface of the screen and carrying it to a new ontological threshold where the digital gains spatial depth.

From Ubiquitous Computing To Spatial Computing

Academic interest in spatial computing and innovative interface design has followed a parallel course with technological advancements, experiencing a radical surge particularly since 2022. Spanning a broad conceptual spec-

trum—from mixed reality/augmented reality interaction paradigms to multimodal interfaces, from affective computing to the Internet of Things, and sensor feedback—this new era points to a paradigm that fundamentally reconfigures the interaction established with technology (Oktay & Yüzer, 2024, p. 478). Human-computer interaction is based on three fundamentals: human, computer, and interaction. The slower evolution of human capabilities compared to the pace of technological development has necessitated that interaction forms evolve to align with human nature. This process represents an interaction where technology is domesticated to the human level, thereby aligning with the user's biological and cognitive limits (Altın, 2016, p. 62). To understand this interaction, concepts such as ubiquitous computing and spatial computing have been developed.

The concept of Ubiquitous Computing (UbiComp) was first introduced in 1991 by Mark Weiser at the Xerox PARC computer research center. UbiComp is based on the idea that computers will become invisible by seamlessly integrating into the fabric of the physical environment and daily life, to the point where they are indistinguishable from it. According to Weiser, the most profound technologies are those that go unnoticed, becoming a natural and silent part of life, much like literacy. This vision presents an "embodied virtuality"—unlike virtual reality, which disconnects the user from the real world—by placing the digital within physical spaces and objects. Computers are distributed throughout the environment by being divided into different scales: centimeters (tabs), decimeters (pads), and meters (boards). The goal is for technology to transition from being a tool that constantly occupies human attention to a quiet presence at the periphery of perception, transforming into an experiential space that activates spontaneously when needed (Weiser, 1991).

The fundamental shift that has propelled the scientific and historical evolution of computing into a third wave—following the mainframe and personal computer (PC) eras—is the philosophy of calm technology. In their article "The Coming Age of Calm Technology," Weiser and Brown predicted that the intersection of ubiquitous computing and personal computing would occur between 2005 and 2020; they defined this period as a transitional phase in which technology becomes deeply embedded within the world. In contrast to the excitement-driven interaction model of the PC era, which exploited the user's attention, calm technology aims to make devices invisible by pulling them into the periphery of human perception. In this new spatial ecosystem where computers are ever-present, the true challenge lies in

achieving a design success that allows technology to be withdrawn from underfoot without disrupting the user's calmness, thereby enabling the individual to fully embody their humanity. For calmness is a fundamental test for all technological designs over the next fifty years (1996).

The continuum diagram above, conceptualized by Paul Milgram and Fumio Kishino, presents the forms of interaction between pure physical reality and a fully artificial virtual environment along a spectrum (1994, p. 1323). The concept that stands in direct opposition to Weiser's vision of ubiquitous computing is virtual reality (VR), which occupies the far right end of the spectrum and isolates the user from the physical world, trapping them in an artificial universe. According to Weiser, while virtual reality may be functional for exploring inaccessible realms such as distant planets or microscopic worlds, at its core it is merely a map, not the terrain itself. VR focuses on simulating the world rather than invisibly enriching it by excluding physical space, other people, and the infinite richness of nature. At this point, Weiser proposed the term "embodied virtuality," which refers to the process of extracting computers from their electronic shells and bringing them into the physical world (1991). This concept encompasses the area defined as "mixed reality" in the diagram, injecting the virtuality of digital data into the physical world.

Note. Adapted from "A Taxonomy of Mixed Reality Visual Displays," by P. Milgram and F. Kishino, 1994, *IEICE Transactions on Information and Systems*, *E77-D*(12), p. 1323.

Mixed Reality (MR)			
Real Environment	*Augmented Reality (AR)*	*Augmented Virtuality (AV)*	*Virtual Environment*

The concept of spatial computing, however, goes beyond being a technical term to redefine the ontological connection between digital and physical reality. Simon Greenwold, who offers one of the most fundamental definitions of the concept in literature, views spatial computing as a form of human-machine interaction in which the machine manipulates references to real

objects and spaces while preserving them. According to Greenwold, this interaction model differs from traditional 3D modeling or digital design processes in that it requires the forms and spaces it addresses to have a real-world counterpart. From this perspective, the screen is no longer merely a window-like surface representing a virtual void; rather, it transforms into a layer that establishes a meaningful and direct connection with the physical world, anchored to a real location (2003, p. 11). Cathy Hackl describes spatial computing as "an evolving 3D-centric form of computing that, at its core, uses AI, Computer Vision and extended reality to blend virtual experiences into the physical world that break free from screens". This system, which enables people and virtual entities to navigate directly through data within a physical environment, builds a new model of communication by taking the relationship with data beyond simulation. Ultimately, this technology has initiated a physical and spatial transformation in human-computer interaction by liberating interaction from the narrow limits of the screen and expanding it into a field that encompasses everything experienced (Hackl, 2023). At the core of this transformation lies, as Greenwold puts it, a deep faith in phenomenology and a prioritization of the qualities of experience. Spatial computing proposes a hybrid reality where machines participate as partners in our physical world by eroding the boundaries between the physical and ideal worlds. In this model, the machine in space and the space within the machine are allowed to bleed into one another; the user, meanwhile, interacts with technology directly using their own physical senses rather than indirect tools like a keyboard (2003, p. 33).

This theoretical transformation in spatial computing represents the next major shift in how humans interact with technology, spanning a wide range of areas from work and education to shopping and leisure activities. This new paradigm is building a more immersive form of interaction—where computers can actively interpret our world—through the integration of artificial intelligence, extended reality (XR), the Internet of Things (IoT), and sensor technologies. At this point, the concept of the "infinite canvas"—which replaces traditional screen architecture—frees digital workstations from their physical constraints, making them portable anywhere (Hackl, 2023). Thus, the screen is no longer a static piece of hardware that one stands in front of; instead, it morphs into an embodied interface that, through artificial intelligence, is integrated into every point of the space and merges with the user's way of experiencing the world.

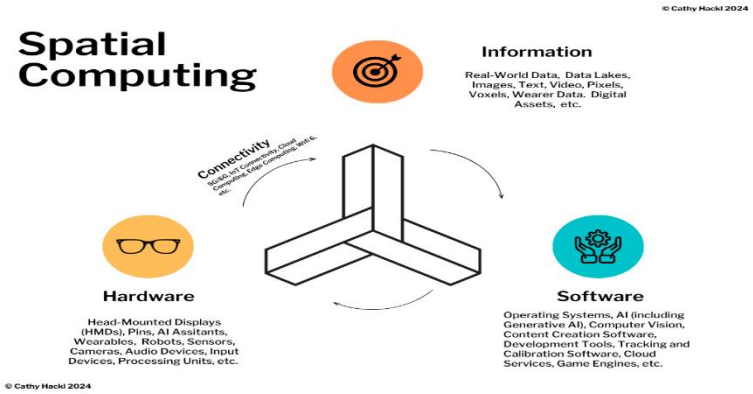


Figure 2: The Spatial Computing Ecosystem and Its Components

Note. This diagram illustrates the cyclical interaction between hardware, software, connectivity, and information within the spatial computing ecosystem. Adapted from "Spatial Computing" by C. Hackl, 2024 (https://www.linkedin.com/pulse/what-spatial-computing-cathy-hackl-pryde).

The three fundamental components Weiser envisioned in 1991 for ubiquitous computing—cheap, low-power computers, a network that ties them together, and software systems—have evolved into the six-layer spatial computing ecosystem outlined by Hackl today. The hardware layer, which Weiser defined as cheap and user-friendly screens, has completed the process of the screen's embodiment by leaving its place to sensory interfaces and spatial infrastructure. Similarly, a simple network has given way to massive computational power (compute) enhanced by 5G/6G, cloud computing, and artificial intelligence; the vision of ubiquitous computing is now defined by multidimensional platforms such as 3D engines, spatial data management, and blockchain (Weiser, 1991 and Hackl, 2023). This comparison demonstrates that computing has evolved beyond being ubiquitous, reconfiguring into a complex, multi-layered, and intelligent experiential domain that encompasses space, data, and the body.

By the late 2000s, the concept of embodied interaction was viewed as a major promise that would redefine interaction in the field of Human-Computer Interaction (HCI). Although it was difficult to predict exactly where interaction styles would evolve at that time, it was anticipated that gesture-based, natural language processing, and ambient sound-focused techniques would be at the center of the vision for ubiquitous computing (Millard & Soylu, 2009, pp. 466, 467). Today, these theoretical predictions have moved beyond being mere theoretical speculations and have become a physical reality through spatial computing. Devices like the Apple Vision Pro have initiated

the final stage of embodied interaction—where the screen is seamlessly integrated into the physical experience—by combining all of these techniques (eye tracking, hand gestures, spatial audio), which were considered difficult to research in 2009, into a single wearable interface.

Embodied Technologies in the Post-Screen Era: Case Studies

In the literature, wearable technologies and embodied interfaces have been examined in depth in various contexts, such as health, fitness, user experience, and ethical challenges. The technical functionality, acceptability, and effectiveness of smartwatches in supporting health and well-being have been validated through systematic reviews (İspirli Turan and Doğanalp Çoban, 2023). It has been observed that these devices assist doctors in operating rooms, enable real-time monitoring of health records, and serve as a source of motivation for achieving fitness goals (Parlakyıldız et al., 2024). In user adoption processes, it has been observed that smartwatches are perceived both as a tool for utility and as an element of "fashnology" (fashion and technology); factors such as low cost and comfort were found to increase their desirability (Chuah et al., 2016).

On the other hand, more advanced bio-digital integrations, such as brain-computer interfaces (BCI), are being discussed in the context of medical innovations—particularly following Neuralink's first human implant in 2024—and the ethical risks they may entail. While these technologies hold the potential to grant independence to individuals with severe disabilities, it is emphasized that they raise critical ethical and regulatory questions regarding privacy, patient autonomy, and the protection of sensitive neural data. On a philosophical level, it is argued that such interactions could blur the boundaries between mind, body, and technology, transforming humans into "cyborg" entities hybridized with machines and potentially leading to ontological shifts such as "disembodied thought" (Lavazza et al., 2025). Current approaches treat embodiment not as a side effect of interactive systems but as a fundamental characteristic representing the state of being part of the world. This process of embodiment, as highlighted in literature, and technology's status as part of the world are evolving into a new dimension where the screen transcends its physical boundaries and extends throughout the entire space.

Apple Vision Pro: Spatial Computing and The Infinite Canvas

Announced by Apple in 2023 and set to reach users globally starting in 2024, the Apple Vision Pro is positioned as a pioneering device that ushers in the

era of spatial computing in the tech world. Described by Apple CEO Tim Cook during the WWDC23 product presentation as "the first Apple product you look through, and not at," this device seamlessly blends digital content with the user's physical environment—unlike traditional screen technologies—and, through the visionOS operating system, offers users an "infinite canvas" experience that extends applications beyond physical boundaries (Apple, 2023). Featuring a 23-million-pixel micro-OLED display system, a dual-chip architecture comprising high-performance M-series and R1 chips, and advanced spatial audio capabilities, the Vision Pro is controlled exclusively via eye movements, hand gestures, and voice commands without the need for any external controllers (Apple, 2024). This device, which expands the user's physical space with digital windows and 3D objects, is equipped with biometric security systems such as Optic ID and the "Environments" feature that personalizes environmental awareness, thereby bringing both work and entertainment practices into a spatial dimension.

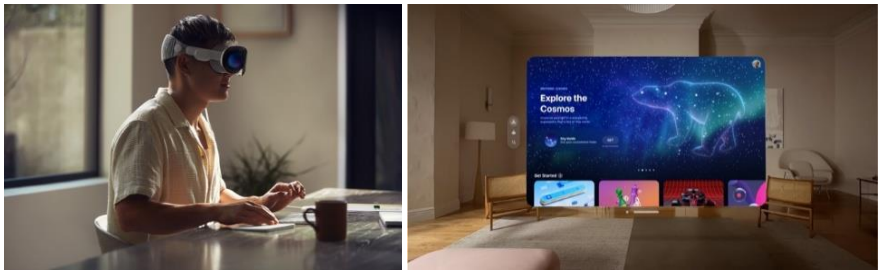


Figure 3: Apple Vision Pro: Spatial Interface Architecture and Real-World Application

Note. Both images are adapted from official Apple (2023) press release assets for WWDC23., The left photograph shows the device used in a productivity context (working) while the right diagram illustrates the visionOS interface architecture.

An examination of the first two years of Apple Vision Pro's market performance reveals that, alongside its revolutionary technological nature, various practical challenges related to the user experience have also come to light. Although the device promised a new era of spatial computing with its spatial solutions that enhance productivity in the business world, production strategies have been revised due to its high cost and failure to meet expected sales figures (ITP.net, 2024). User feedback and studies conducted by institutions such as Stanford University highlight issues such as low-level visual distortions caused by "passthrough" technology, the sensation of "world lag," and the accompanying "motion sickness" (VRS, 2024). Furthermore, despite the visual depth the device offers, its potential to create physical and

social isolation raises significant questions in user narratives about how technology mediates the connection with the real world.

Apple Vision Pro represents an advanced stage in the concept of embodiment relations, where technology transcends its role as an object to become an integral part of how the subject perceives the world. In this relationship, technology aims to establish an "I-technology-world" unity by becoming transparent between the subject and the world. Vision Pro eliminates traditional input devices by directly transforming the user's eyes, hands, and voice into control mechanisms, thereby making the device a natural extension of the body. The device's high-resolution passthrough feature seeks to render the technical mediation invisible by allowing the user to perceive the world not through a screen, but through the perspective provided by technology. However, the visual delays mentioned in the experience section and the device's physical weight disrupt the ideal of full transparency highlighted by Ihde, altering the technology from a tool back into a noticeable object.

Apple Vision Pro represents the technological pinnacle of the desire for users to engage directly with content—a concept explained by Bolter and Grusin as immediacy—where the medium steps aside. While traditional publishing involves a physical screen barrier between the viewer and the content that must be overcome, Vision Pro blurs this boundary, marking the beginning of the spatial publishing era. The device's infinite canvas reimagines content not as something confined to a two-dimensional frame, but as an integral part of physical reality (remediation). This signifies a shift in publishing practices from passive viewing to an immersive experience where the user is situated within the content. The desire for immediacy enables the user to perceive digital objects as if they were real, thanks to the interface's integration with the spatial environment. Thus, publishing transforms into a hybrid narrative form that adds digital layers to the user's lived world, rather than merely projecting images onto a surface.

Apple Vision Pro can be viewed as a modern and tangible embodiment of the vision of ubiquitous computing. It aims to achieve Weiser's ideal of technology by receding into the background to become invisible—or becoming calm technology—by projecting digital data into the physical space. With Vision Pro, the concept of spatial computing has moved beyond the boundaries of the screen to become an ecosystem. In this system, the lines between the physical and digital worlds are blurring. By integrating computing into the user's perspective and the space they are in, the device places technology

within the living environment. This signifies that the Apple Vision Pro represents not merely a viewing device, but a new phase where computing becomes spatialized, the screen materializes to merge with the surroundings, and technology evolves from a tool into an integral part of the living environment.

Mojo Vision: Retinal Interface and The Invisible Screen

Developed by Mojo Vision, the Mojo Lens represents a revolutionary milestone in the history of technology as the world's first augmented reality (AR)-based smart contact lens. Designed with the "invisible computing" philosophy, this device aims to eliminate the traditional concept of a screen by projecting digital information directly onto the user's retina rather than onto an external surface (New Atlas, 2022). Featuring the world's smallest MicroLED display with a pixel density of 14,000 pixels per inch, integrated eye-tracking sensors, and low-power micro-batteries, this patented technology places the interface directly onto biological tissue (Insights GreyB, 2023). The device, which garnered attention in 2022 with successful in-eye prototype tests, promised a seamless data layer, particularly for users requiring hands-free access to information. However, the company announced that, following a strategic decision in early 2023, it had suspended the smart lens project due to financial difficulties and technical barriers, shifting its focus to MicroLED panel components (Mojo Vision, 2023).

From the perspective of embodiment relations, Mojo Vision represents a radical stage in which technology is integrated with a biological organ at the highest level. Physical barriers such as external hardware and weight, observed in the Apple Vision Pro, are completely eliminated in the Mojo Lens through the interface's direct placement on the cornea. This brings us closer to the ideal where technology, within the "I-technology-world" framework, becomes entirely transparent and merges with the subject's perception of the world. The retinal interface integrates digital data into the user's natural gaze, redefining technology from an external tool into a prosthetic extension of the body. The user no longer looks at a screen but interacts directly with the world through this invisible layer. Thus, the Mojo Lens represents a process in which the screen is both wearable and biologically integrated, making technological mediation an inseparable part of human perception.

Mojo Vision is pushing the technological boundaries of the desire to make content directly experiential by making the medium itself disappear—a concept known as immediacy—. Unlike traditional screens, this system projects

the image directly onto the retina, freeing publishing practices from dependence on a physical surface and transitioning them into a framework mediated by retinal interfaces. In this process, information provided by external devices such as smartphones or televisions is integrated by being re-envisioned (remediated) within the biological field of view. As a result, publishing evolves from the act of looking at an object into a seamless and immediate form of interaction where information becomes part of the user's perception of reality.

Mojo Vision represents one of the most radical examples of Mark Weiser's vision of ubiquitous computing, where technology becomes invisible by seamlessly integrating into the fabric of everyday life. The device aims to embody the philosophy of "calm technology" on a biological level by placing digital information directly within the user's line of sight and perceptual periphery. In line with the definition of spatial computing, it eliminates the boundaries of the screen and fuses digital data directly with the real world, enabling interaction with the user's physical senses. This structure, liberated from screens, transforms computing from a tool into a transparent experiential space that integrates with the environment. The invisible computing model offered by Mojo Vision can be considered one of the most critical case studies of the post-screen era, where the screen becomes embodied and biological, and technology ceases to be an object one stands before but instead becomes a living environment one looks through.

Bose Frames and Ray-Ban Meta: Audio Augmented Reality and Spatial Narrative

Announced by Bose in 2018, Bose Frames entered the tech world as the world's first audio augmented reality (Audio AR) platform, creating a new category of wearable devices based on spatial audio (Bose, 2018). Unlike traditional headphones, this gadget has an open-ear design that delivers spatial audio to the user without blocking ambient sounds, creating a personal sound field through micro-speakers hidden in the temples of the glasses. Taking this vision a step further, Ray-Ban Meta smart glasses have become one of the most successful examples of wearable technology in the market by combining the iconic eyewear design with advanced artificial intelligence (Meta AI), camera systems, and live streaming features (Metaflix, 2024). These devices allow users to create content directly from their own point of view (POV) and interact with their surroundings hands-free, shifting the digital layer from a visual to an auditory and spatial level. However, this integration has also sparked serious privacy debates, particularly regarding the use of cameras for covert recording (Carleton University, 2025).



Figure 4: *Ray-Ban Meta Smart Glasses As an Embodied Wearable Interface*

Note. Adapted from official Meta Newsroom (2023) press assets. The subtle camera lens on the frame exemplifies the invisibility of embodied technology in daily life.

In terms of embodiment relations, these smart glasses represent a stage where technology becomes transparent by integrating with a physical accessory. The device ceases to be an external object standing before the user and becomes a sensory layer that accompanies the way the world is perceived. The familiarity provided by the glasses' form makes the user forget the hardware's presence, allowing technology to be perceived as an extension of the body. The blending of the auditory layer with sounds from the outside world has smoothed the technological mediation between the subject and the world. The disappearance of the screen as a physical surface has led to the interface evolving into an experiential space that harmonizes with bodily movements.

The concept of immediacy comes to life in these smart glasses through a screenless broadcasting format. Rather than confining the image to a screen, Ray-Ban Meta aims to remove the medium and present content as an immediacy experience by transmitting the user's direct point of view (POV) through live streams. This represents, as part of the remediation process in broadcasting practices, a shift away from the camera's external position toward integration with the user's physical movements. Information and content are injected seamlessly into the user's natural environment via auditory AR. In this way, broadcasting evolves from the act of looking at a surface into a spatial narrative layer that is experienced, shared, and transformed into a physical action.

Weiser's vision of ubiquitous computing becomes a tangible reality through the ambient artificial intelligence offered by Bose and Meta. These devices

have adopted the philosophy of calm technology. In the spatial computing ecosystem described by Hackl, sound and artificial intelligence converge with the physical environment, thereby reducing screen dependency. However, this invisibility also brings ethical risks, such as constant surveillance, thereby sparking debate about the ideal of ubiquitous computing. Ultimately, these glasses, offering both audio and visual AR integration, reflect a hybrid living space where computing is not just everywhere but always with us in this post-screen era where the screen has become embodied.

Humane AI Pin: Screenless Interface and Palm Projection

Humane was founded in 2018 by Imran Chaudhri and Bethany Bongiorno—who held key roles in user interface (UI) and design at Apple—with a vision for a post-smartphone computing era (Startupik, 2024). The company introduced a wearable device model in 2023—the AI pin—that removes the screen from a physical surface and places it directly in the user's palm, launching it to the market in 2024. This device, which attaches to clothing via magnets, aims to eliminate traditional glass-panel interfaces by projecting visual information onto the user's hand using "Laser Ink" technology (Startupik, 2024). Managed via voice commands, hand gestures, and an advanced AI assistant, this screenless device promises to deliver information as an instant and direct experience. However, following its launch, the device faced a high volume of returns due to overheating issues and technical limitations, failing to replace the smartphone's multifunctional capabilities and ultimately becoming a strategic failure (The Hindu, 2024; Dare Obasanjo, 2024).

Within the framework of embodiment relations, AI Pin represents technology's effort to move beyond being an external object of the body and instead become identified with the subject's way of perceiving the world. The device's structure, which attaches to clothing at chest level, aims to make the user forget the hardware's presence, thereby elevating technology to the status of a body extension. Projecting the image onto the palm aims to make the technological mediation between the subject and the world transparent by sealing the screen against a biological surface. However, the physical comfort issues and technical glitches encountered during the experience disrupt this ideal transparency, pushing technology back into the role of a noticeable and uncomfortable object. This situation shows that the process of the screen becoming part of the body is possible not only through the miniaturization of the hardware but also through sensory and technical perfection.

The desire for immediacy is reflected in AI Pin's vision of removing the screen and presenting content to the user without any mediating surface. Rather than confining publishing practices to a traditional framework, the device symbolizes media's effort to make itself invisible by transferring information to an organic, palm-sized platform. In this process, the visual intensity of smartphone screens has given way to a new publishing model based on physical gestures and an immediate flow of information. Making content visible through a physical action (opening the hand) represents the integration of media into the natural flow of life. However, confining information to the palm limits the spatial expansion of publishing, forcing the user to interact with a restricted visual field.

The vision of ubiquitous computing aims to create an ecosystem where technology takes a backseat with the AI Pin, continuing to exist as a calm assistant. The device seeks to free computing from the narrow confines of screens and extend it into the user's field of motion and environmental interactions. From a spatial computing perspective, the goal is to make data accessible wherever the user goes, rather than from a fixed location. However, the calm nature of technology—which is supposed to become invisible—has become complicated due to technical limitations and social adaptation issues. As a result, while the AI Pin offers a bold experiment in the post-screen era where the screen has become embodied, it remains a critical case study illustrating the challenges involved in making technology a natural and transparent part of life.

Conclusion and Discussion

The static broadcasting structure of the traditional media order, in which the screen is positioned as an external surface opposite the subject, has given way to a dynamic process of embodiment with the digitization and miniaturization of hardware. The four distinct technological cases examined in this study on the phenomenological and conceptual levels reflect the characteristic features of the post-screen era, in which the screen has detached from physical space and integrated into the human body. Interfaces such as Apple Vision Pro, Mojo Vision, Bose/Ray-Ban Meta, and Humane AI Pin have transformed broadcasting practices from mere content transmission into a hybrid experiential space where bodily senses interact with digital information.

The "infinite canvas" approach offered by Apple Vision Pro has demonstrated the potential of spatial computing to break down the boundaries of

the screen and spread content throughout the entire space. This represents the spatial peak of the interaction model described by Don Ihde in his concept of "embodiment relations," where technology becomes integrated into perceptual processes to reshape the way we experience the world. Mojo Vision smart lenses, on the other hand, have brought this process to a biological dimension, bringing the vision of invisible computing to life through retinal interfaces. The interface's direct integration into biological tissue elevates the ideal of transparency in Ihde's "I-technology-world" formula to a point of biological symbiosis; it transforms the screen from an object to be viewed into an aspect of the gaze itself. Both cases represent the technological counterpart of the effort to achieve full integration with reality by making the medium itself fade into the background—a pursuit often described as the desire for immediacy. The Bose Frames and Ray-Ban Meta glasses, examined within the context of auditory augmented reality and spatial narrative, demonstrate that the digital layer has shed its visual dominance to gain auditory and sensory depth. These devices embody Mark Weiser's philosophy of "calm technology"—which envisions technology receding into the background to become a natural part of daily life—in the form of a wearable accessory. On the other hand, the Humane AI Pin serves as a reminder that hardware miniaturization alone is insufficient in the process of the screen's embodiment; it underscores the importance of flawless technical transparency and sensory harmony.

This study reveals that the process of the screen's embodiment redefines the human body from a passive receiver into an active bio-digital interface of broadcasting. In this new era where content breaks free from traditional frames to become spatialized and biologized, broadcasting no longer represents the act of looking at an object but rather the very state of being within the world. The user, who is transforming into a posthuman subject, experiences technology not as an external tool but as a foundational component of their own existence and media production. Conclusively, this study explores the doors to a new era of communication in this hybrid reality where the screen has become obsolete—an era in which mind, body, and technology form an inseparable unity.

The process of embodiment of the screen, beyond being a technological convenience, brings some risks in terms of privacy and ethics. In this new ecosystem where the body has transformed into a broadcasting interface, the boundaries of privacy are becoming blurred, and the privacy of biometric

data is emerging as a significant concern. In these systems, the body functions not merely as a passive recipient of content but also as an active broadcasting organ that continuously transmits its biological data, sensory responses, and real-time neural outputs to the outside world. The interface's integration with the body and the senses renders the act of turning off the screen technically and psychologically impossible, trapping the individual in a spiral of unavoidable hyper-connectivity and what can be described as "digital obesity"-a state of cognitive overload caused by the continuous and unmanageable consumption of digital data. This situation carries the risk that the ideal of technological transparency actually renders control and surveillance mechanisms invisible and unavoidable.

Furthermore, the high costs and limited accessibility of most of the technologies under examination act as barriers to the democratization of bio-digital integration; this creates a new level of digital inequality that could result in technological embodiment remaining exclusive to a specific socio-economic section of society. Ultimately, this entire process represents a phase of "cyborgization" through the human-machine symbiosis envisioned by Donna Haraway (2006). The incorporation of technology into perceptual processes as a transparent layer transforms the individual into a post humanist subject whose experience of reality is inseparable from technological mediations. The body, which has become both the carrier and the constitutive element of media, is being reconstructed as the medium, instrument, and subject of publishing practices; this situation also reconfigures the ontological foundation of communication.

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Technically, on the centenary of its discovery, television has become an extension of the eye; mobile phones an extension of the hand; chips an extension of the brain; and cloud systems an extension of memory, allowing us to watch on all screens. In a structure where we are integrated with screens, humankind, oscillating between the real and the virtual world, has reached the stage of deciding where it wants to spend more time.

In the last few years, artificial intelligence, which has brought a new breath to the screen in the field of content creation, estimates that there are between 22 and 30 billion active screen devices worldwide. Compilation from statistical websites indicates approximately 7.6 billion smartphones, over 2 billion tablets and computers, and around 17.4 billion smart televisions and other smart screens. When game consoles, car screens, digital billboards, and all kinds of informational screens in cities are added to this number, the figure increases even more.

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