

The Prospects of Multimedia in 2025: Emerging Patterns to Monitor

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Abstract

The term multimedia describes the computer-aided combination of text, illustrations, graphics, audio, animation, still and moving images (videos), and any other medium that allows for the digital expression, storing, processing, and communication of any kind of information. The word of the decade is multimedia. It is a buzzword that has been used in a variety of contexts. It appears on the covers of movies, CDs, literature, newspapers, and handheld games. Shoes, hairstyles, drugs, automobiles, computers, soft drinks, beer, kitchen floor, vacation, airline, TV, phone, house, museum, newspaper, arcade, theme park, Olympic Games, and shopping mall advertisements. The ability to use multimedia is quickly becoming as fundamental to 21st-century living as reading is now. Multimedia is altering the whole nature of reading. Multimedia presents text in a way that adds a significant new dimension to words, making reading more dynamic than only the linear format seen in books. Multimedia works quite well. According to Computer Technology Research (CTR) Corporation, a publishing and research business, individuals only remember 20% of what they hear and 30% of what they see. They may, however, remember only 50% of the stuff they see and hear and up to 80% of what they together view, sense, and perform. For this reason, multimedia is an invaluable teaching and learning tool. The biggest difficulty facing media research today and, in the future, will be the proliferation of media and the segmentation of audiences. New tools will be needed to assist with choice-making easier through the media selection process. This study integrates and supplements the existing media surveys with a practical approach to media research to address the issues caused by the media explosion and what technology will be used in the future.

Keywords: Multimedia, Technology, Blockchain, movies, graphics, audio, animation

INTRODUCTION

From the user's perspective, multimedia means that computer information can be represented through audio and/or video, in addition to text, image, graphics, and animation. The integration of this media into the computer provides additional possibilities for the use of the currently available computational power. Furthermore, their data can be transmitted through computer and telecommunication networks, which implies applications in the area of information distribution and cooperative work, as shown in Figure 1 [1].

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- Application
- Graphical user interface
- Multimedia extension
- Operating system
- Software drivers
- Multimedia driver support
- System hardware
- Add-on multimedia devices and peripherals

<i>Applications</i>		
Graphic user interface	Multimedia extensions	
O.S.	Software drivers	Multimedia driver support
System hardware (Multimedia-enabled)		Add-on multimedia devices and peripherals

Figure 1. Global structure of multimedia.

FUTURE OF MULTIMEDIA

By 2025, the constantly changing field of multimedia is expected to undergo radical metamorphosis [2]. The sector is set to revolutionize the way people interact and consume content because of its cutting-edge technological and creative breakthroughs. The following are emerging trends that are set to shape the future of multimedia:

1. *Spatial computing*: Redefining interaction
2. *Generative media*: Where AI meets creativity
3. *Extended reality (XR)*: Bridging the physical and virtual worlds
4. *Holographic experiences*: Bringing fiction to reality
5. *Blockchain in multimedia*: Ensuring transparency and security
6. *Emotional AI*: Enhancing user connection
7. *Biometric integration*: Personalizing user experiences
8. *Sustainable media production*: Eco-friendly creativity
9. *Immersive journalism*: Beyond the headlines
10. *Virtual production studios*: Redefining filmmaking
11. *5G revolution*: Unleashing high-speed connectivity
12. *Gamification of educational content*: Learning through play
13. *Personalized cinematic experiences*: Tailored for you

Spatial Computing: Redefining Interaction

Multimedia has a spatial future. Spatial computing is the smooth merging of digital and physical domains and is gaining popularity. Analyze how this trend alters user interaction in e-commerce from virtual try-on experiences to immersive instructional simulations [3].

Spatial computing is a significant technical development that redefines the interaction between digital and physical environments by combining artificial intelligence (AI), augmented reality (AR), and virtual reality (VR) [4]. This technology creates unprecedented opportunities to enhance productivity, reinvent experiences, and blur the boundaries between the digital and physical realms [5].

It facilitates the development of new physical workflows, integrates information from various types of sensors to improve user experience, automates the digital twin creation process, and establishes a connection with robotic process automation [6].

Generative Media: Where AI Meets Creativity

Artificial intelligence is a key component of creative processes when using generative media. Explore the ways in which AI algorithms produce dynamic, tailored content and evolve into co-creators [7]. See how AI affects various industries, including scriptwriting, music composition, and tailored content recommendations.

Generative AI improves creative work by generating a variety of content formats including text, graphics, and music. It increases productivity, generates new concepts, and customizes the user experience [8]. AI in design expedites the generation of concepts and optimizes solutions.

The term ‘generative artificial intelligence’ or ‘generative AI’ describes the use of AI in the production of fresh text, graphics, audio, video, and music. The foundation models (big AI models) that drive generative AI are capable of multitasking and performing custom tasks such as classification, question and answer, and summarization.

Generic artificial intelligence (AI) refers to algorithms (e.g., ChatGPT) that may generate new content, such as images, text, audio, code, simulations, and movies. The approach to content creation may change significantly because of recent industrial developments [9].

Extended Reality (XR): Bridging the Physical and Virtual Worlds

The term “Extended Reality,” which includes AR, VR, and MR, is expanding the definition of immersive experiences. Discovering how the merging of digital and physical realities through XR is transforming narrative, gaming, and education by offering users immersive and participatory experiences.

For extended reality to function, visual data must be acquired, shared, or accessed locally, transferred over a network, and then presented to human senses [10]. These gadgets allow users to respond in real-time to virtual stimuli, creating personalized experiences.

Education, retail, healthcare, and industrial manufacturing are just a few industries in which XR is changing as it revolutionizes daily consumer encounters. XR technology is ideal for virtual tourism and education, allowing people to travel to any location on Earth (and beyond!) at any point in history [11]. Behavior trees and machine learning are utilized to build intelligent non-player characters (NPCs) in VR games that respond convincingly to players’ strategies.

Holographic Experiences: Bringing Fiction to Reality

Holograms that were once fantastic ideas are beginning to come true. Discover how holographic experiences—from lifelike virtual concerts to holographic shop displays—are making their way into the mainstream. See how amazing technology is creating a tangible, breathtaking reality from fiction [12].

Projected light and electromagnetic energy provide the appearance of solid objects in holograms. In the present era, fictional creation is beginning to become true. Holograms for experiential learning are starting to become a reality today.

With the use of hologram technology, one can view without the need for any specialized gear, such as cameras or glasses. Because the image can be viewed from any angle, the object appears to move and shift realistically as the viewer moves around the display [13].

In the future, holograms could be utilized in a range of contexts, such as corporate meetings and doctor visits, to facilitate more efficient and interesting communication and teamwork. Holograms have the power to change the way people engage and communicate in a wide range of contexts.

Blockchain in Multimedia: Ensuring Transparency and Security

The blockchain technology is used in an additional phase of trust and openness in the multimedia industry [14]. Examine its effects on guaranteeing just pay to creators, getting a grid of copyright violations, and improving the circulation of digital content.

Blockchain is a new and exciting technology that can publicly defend a network and confirm transactions by introducing transparency and trust. Before implementing a blockchain solution security model, administrators must develop a risk model that can address all commercial, governance, technology, and process concerns. Subsequently, they must evaluate the risks associated with the blockchain solution and create a threat model [15].

The application of blockchain by Unilever to improve transparency in digital advertising efforts is an instance of technology in use in the real world. Unilever was able to ensure that its advertisements reached their target audience without being fraudulently shown, by employing blockchain technology to track and verify where their advertising was being displayed.

Emotional AI: Enhancing User Connection

In the future, the multimedia will be emotionally intelligent. Explore the world of Emotional AI, where devices can recognize, understand, and react to human emotions. Learn how technology, such as emotionally sensitive virtual assistants and targeted advertising, enables more empathic user experiences [16].

By recognizing and appreciating their feelings, AI fosters deeper ties with consumers and increases their brand affinity. In a congested market, this emotional connection can help a company to stand out and encourage consumer advocacy and loyalty.

AI also showed that it was more methodical than people when it came to providing emotional support and avoiding making overly detailed recommendations. According to Yin, “Ironically, AI was better at applying emotional support techniques that have been demonstrated to be sympathetic and validating in earlier research.”

Emotional AI uses a variety of techniques, including voice recognition, facial identification, biometric sensors, and natural language processing, to identify emotions. Using these methods, the system can identify patterns in speech, behavior, and facial expressions to deduce emotional states in people. Customer service chatbots are an example [17].

Biometric Integration: Personalizing User Experiences

Effective enterprise resource planning (ERP) implementation depends on automation. This module allows human resources (HR) attendance to be automated by connecting to an Odoo-compatible thumb or face detection device. Using our thumb, we can set up a user for both.

Multimedia is increasingly using biometric integration, which improves security and personalization [18]. Examine the ways in which biometrics, from fingerprint scanning to facial recognition, influence User Interfaces (UIs), suggested content, and even customized gaming experiences, as shown in Figure 2. The following are examples of biometric security.

Sustainable Media Production: Eco-friendly Creativity

Sustainability is of paramount importance when producing multimedia content. Examine the ways in which the industry adopts environmentally friendly methods such as carbon-neutral streaming services and green filmmaking approaches. How artists integrate environmental responsibility into their creative activities [19].

Use physical identifiers to digitally grant a user access to systems, devices, or data.

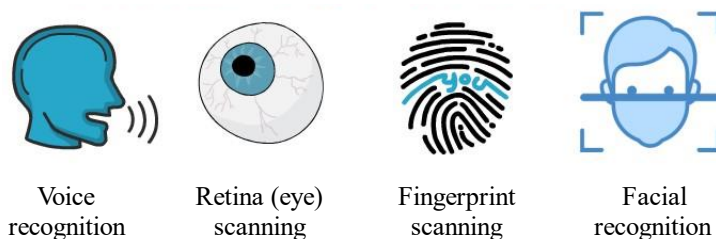


Figure 2. Physical biometric devices.

Eco-friendly technology, sometimes referred to as green, clean, or environmental technology, can protect the environment by reducing toxic waste and increasing energy efficiency. Green tech startups use current advances in ecological research and green chemistry to reduce the adverse impact of lifestyle choices on the environment.

Through the energy and materials consumed in filming, editing, and distribution, as well as the trash and emissions produced by travel, equipment, and sets, media manufacturing can contribute to global warming, air pollution, and biodiversity depletion. Media production is more sustainable, using the following:

- Assess your impact
- Choose green locations
- Use eco-friendly equipment
- Educate and engage your team
- Collaborate with partners
- Innovation and experiment

Immersive Journalism: Beyond the Headlines

Journalism uses immersion technologies to bring news stories to life. By using VR and AR, immersive journalism takes viewers into the center of news events. Observe the possible influence of intricate global concerns on audience empathy and participation [20].

A subset of journalism known as “immersive journalism” uses extended reality technologies to bring viewers into the narrative. This makes it possible for the viewer to become more fully immersed in the story setting and appreciate the scope of the material. Immersion technologies have many advantages for journalism, of which the following are the most significant.

- Information remains better in VR, boosting the impact and recall of stories.
- It gives journalists the ability to solve issues, be more inventive and creative, and collaborate closely with the public.
- It conveys a stronger sense of honesty and openness.
- This allows the viewer more flexibility in terms of using the device of their choice to consume the content.
- It is attainable in an effortless manner.
- It endows the news with additional meaning.

Virtual Production Studios: Redefining Filmmaking

The introduction of virtual production studios has brought about drastic changes in the practice of traditional filmmaking. Exploring the ways in which virtual worlds, real-time rendering, and digital sets enable filmmakers to transform the filmmaking process and achieve previously unattainable levels of cost and creative efficiency.

As a revolutionary development in the film industry, virtual production has completely changed the portrayal of tales on large screens. Virtual production has made it possible for filmmakers to overcome the constraints of conventional production techniques and create immersive, aesthetically spectacular cinematic experiences that enthrall viewers all over the world by skillfully fusing cutting-edge technologies with inventive creativity.

The impact of virtual production goes beyond the film industry and affects other media and entertainment domains such as television, video games, and AR. Because of its broad use, filmmaking can now be performed in a more environmentally friendly way by avoiding the need for lengthy travel and the negative effects that old production methods have on the environment [21].

5G Revolution: Unleashing High-speed Connectivity

Multimedia experience will be revolutionized by the introduction of 5G technology. Examine the effects of extremely fast connectivity on AR/VR applications, live broadcasting, and real-time collaborative content production. See the possibilities for smooth and excellent multimedia experiences available to everyone on the planet.

Immersion in VR, AR apps, and high-quality streaming will all become more widely available, improving user experience and creating new opportunities for content producers. The fastest internet connection available is fiber-based. In addition to being dependable, cable internet offers speeds that are faster than Digital Subscriber Line (DSL). Just think of how quickly big files can be downloaded, stream High Definition (HD) videos without any lag, and participate in video conferences. Excitel delivers high-speed connectivity directly to your doorstep.

Gamification of Educational Content: Learning Through Play

Education adopts gamification as a potent engagement technique. Explore how interactive games are created from instructional content through multimedia to make learning more fun and efficient. See how learning and fun can coexist for students of all ages.

An educational strategy known as “gamification of learning” uses elements of video games and game designs to create an engaging learning environment for pupils. Maximizing enjoyment and engagement by piquing learners’ attention and motivating them to continue studying is the aim.

This method of incorporating activities with gaming characteristics is called gamification. Gamification in education aims to boost student engagement through student-led learning, creativity, competition, and instant feedback.

Personalized Cinematic Experiences: Tailored for You

Moviegoing experiences have become increasingly customized. Discover how AI systems evaluate personal tastes in producing original movies and TV show suggestions. Watch possibilities for highly customized content that turns every viewing experience into a unique journey.

The deep and engrossing sensation that one has when watching a film in a way that completely stimulates the senses and emotions is referred to as a “cinematic experience.” This entails setting up a scene and ambiance that makes the movie more enjoyable. There are several ways to create a cinematic experience.

- Relaxed seating.
- Mood lighting.
- Get rid of glare.
- Cinema sound.
- Screen time.
- Home cinema projectors.

CONCLUSION

The future of multimedia is a blank canvas that will be painted with inventiveness, originality, and technological mastery. The way we see and engage with audiovisual information can be drastically altered by these new advancements, which vary from spatial computing to emotionally sophisticated AI.

The voyage into the multimedia frontier, where the bounds of creativity are constantly enlarged, promises to be an exciting adventure into an unexplored terrain as audiences, creators, and technologies collide. Multimedia is headed in this space. Spatial computing is the expanding field of seamless integration of digital and physical spaces. Consider how this evolution affects user experience from virtual try-ons in e-commerce to rich instructional simulations.

By 2025, interactive multimedia experiences, such as AR and VR, are expected to increase in popularity. Through these developments, users can immerse themselves in experiences that blur the lines between reality and VR, opening up new channels for storytelling and engagement.

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