

ARTIFICIAL INTELLIGENCE AND THE FUTURE OF CREATIVE INDUSTRIES: BRIDGING CULTURES BEYOND LOCALITIES VIA TECH IN JAMES CAMERON'S *AVATAR*-THE SEQUEL

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Abstract

Artificial Intelligence (AI) has evolved from theoretical inquiry into a practical force shaping diverse fields, including filmmaking and theatre production. Defined as machine systems capable of simulating cognitive functions such as reasoning, learning, and decision-making, AI has advanced through milestones from Turing's 1950 "imitation game" to the development of expert systems, data-driven models, and deep learning applications. This paper examines the intersection of AI and creative industries, with particular focus on filmmaker James Cameron's integration of advanced AI tools in productions like Avatar and The Terminator. Cameron's innovative use of performance capture, CGI, and machine learning exemplifies AI's role in enhancing efficiency, expanding artistic possibilities, and enabling large-scale visual storytelling. Yet, his perspective underscores that AI should function as an assistant rather than a replacement, as human emotion and imagination remain central to storytelling. The discussion further extends to Nollywood, Nigeria's dynamic film industry, which has begun adopting advanced technologies but still lags in AI-driven innovation. To showcase how artificial intelligence and advanced technology, as demonstrated in James Cameron's Avatar sequel, effectively bridge cultural differences beyond geographical boundaries by enabling immersive storytelling and bridging cultures surpassing localities in the creative industries. Therefore, the study employs Qualitative research methodology using content analysis approach. Drawing lessons from global practices, the paper argues that Nollywood filmmakers must embrace AI collaboration, technological investment, and partnerships with experts to achieve international recognition and sustainable growth. Ultimately, AI offers creative industries tools to streamline production, reduce costs, and expand artistic horizons, but its effectiveness depends on balancing automation with human creativity, ensuring that the emotional depth of performance and storytelling remains intact.

Keywords: Artificial Intelligence (AI), Avatar, Computer-Generated Imagery (CGI), Performance Capture, Nollywood

Introduction:

Artificial intelligence is the intelligence of machines or software, as opposed to the intelligence of humans. It is a field of study in computer science that develops and studies intelligent machines. Such machines may be called artificial intelligence can be considered as a form of intelligence that is produced by machines. According to Arun Singh:

Artificial intelligence is characterized as computer programs designed to solve complex problems by implementations of processes similar to human cognition. This is the area of

computer science where intelligent machines and software are researched and created. The area of research was based on the claim that a fundamental human trait, intellect the knowledge of Homo sapiens can be so accurately defined that a computer would replicate it (1).

The purpose of artificial intelligence innovations, system creates for solving sophisticated challenges equally to human mental function that require human intelligence. According to Blagoj Delipetrev, Chrisa Tsinaraki, Uroš Kostić:

Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behavior by analyzing how the environment is affected by their previous actions (5).

AI is systematically developed by human with the aim of sharing a difficult goal, physically executing task and in another way digitally crafted by perceiving their environment through program algorithm data, thereby explaining the gathered structured or unstructured data and treating the information derive from the data and choose the best action to achieve. According to Kory W. Mathewson and Piotr Mirowski, "Artificial Improvisor is a form of artificial conversational agent, or chatbot, focused on open domain dialogue and collaborative narrative generation" (66). Vasilis Tsiavos and Fotis Kitsios, Artificial intelligence (AI) is a technology that augments human thinking in machines, can perform human-like actions, learn from data and solve problems.

A subset of artificial intelligence is machine learning, which refers to the ability of machines and computers to learn automatically and adjust to new data with no human intervention, using deep learning techniques where such learning is facilitated by absorbing massive amounts of data (Big Data) such as text, pictures etc (1). Mohamed El Hadi posits that, AI is defined as the ability of machines systems to acquire and apply knowledge, and to carry out intelligent behavior. This includes a variety of cognitive tasks (e.g., sensing, processing oral languages, reasoning, learning, and making decisions), and ability to move and manipulate objects accordingly (1) According to David T quoting Sanjay Singh, the concept of Artificial Intelligence (AI), once confined to the realm of science fiction, has emerged as a profound and transformative force in the modern world. From its early days as a theoretical pursuit to its current state as a pivotal technology driving innovation across industries, AI's journey has been one of persistent advancement and paradigm shifting breakthroughs (1).

In 1950, Alan Turing published the milestone paper "Computing machinery and intelligence" (Turing 1950), considering the fundamental question "Can machines think?" Turing proposed an imitation game, known as the Turing test afterwards, where if a machine could carry on a conversation indistinguishable from a conversation with a human being, then it is reasonable to say that the machine is intelligent. The first AI period began with the Dartmouth conference in 1956, where AI got its name and mission. McCarthy coined the term "artificial intelligence," which became the name of the scientific field.

In the 1980s, the AI paradigm shifted to symbolic AI and the so-called expert systems or knowledge-based systems. The underlying idea was to get human expert knowledge in a computer form and spread it as a program to many Personal Computers (PCs). Expert systems had two components: 1. the knowledge base on a collection of facts, rules, and relationships on a specific domain; and 2. the inference engine that described how to manipulate and combine these symbols. The facts and rules had explicit representation

and were modifiable. Lisp and Prolog were the main symbolic programming languages. Companies started producing expert systems in the 1990s. These companies offered software packages called “inference engines” and related knowledge services to customers. However, these tools and frameworks lacked sufficient expressive power to capture the breadth of the expert knowledge and behavior required to achieve satisfactory performance.

In the 1990s and 2010s, AI had addressed complex problems, providing solutions that were found to be useful in different application domains including data mining, industrial robotics, logistics, business intelligence, banking software, medical diagnosis, recommendation systems, and search engines. AI researchers began to develop and use more sophisticated mathematical tools. There was a widespread realization that many AI problems have already been worked on by researchers in fields like mathematics, economics, or operations research. The shared mathematical language allowed a higher level of collaboration with established fields and made AI a more rigorous scientific discipline.

In 2006, Fei-Fei Li, a computer science professor at Stanford University, contributed to a paradigm change. The established wisdom of the researchers at that time was that if you can't even do one image well, why try with thousands or tens of thousands of images? Her hypothesis was that AI's main limitation is the data quantity to reflect the real-world scenarios and that more data will produce better models. In 2009, ImageNet was published containing 3.2 million labelled images, separated into 5,247 categories, sorted into 12 subtrees like "mammal", "vehicle", "furniture", etc.

Background on James Cameron

James Cameron is a well-known Canadian film director, deep-sea explorer, and inventor, born in Kapuskasing, Ontario on August 16, 1954. He gained recognition for directing and writing hit movies like *The Terminator*, *Aliens*, *Titanic*, and *Avatar*. Before becoming a filmmaker, Cameron had various jobs, including working as a truck driver and pursuing studies in physics at California State University. He directed, wrote, co-produced, and co-edited *Titanic* 1997, winning Academy Awards for Best Picture, Best Director, and Best Film Editing. He is a recipient of various other industry accolades, and three of his films have been selected for preservation in the National Film Registry by the Library of Congress. According to Kathy Hustchins:

A look through Cameron's filmography shows a consistent drive to push the boundaries of cinematic technology. Today, with the advancements in generative AI, Cameron is once again at the forefront. In *Avatar* the way of water his team incorporated machine learning algorithms to assist with special effects and streamline production workflows. He also used AI during the previsualization stage, helping shape scenes before they were filmed. However, Cameron has also advocated the importance of using AI as a tool to assist, not replace, creativity (np).

James Cameron is known for embracing creativity and innovation through his relentless pursuit of integrating cutting-edge technology with storytelling. He pioneered advanced techniques like performance capture, which records actors' body movements, facial expressions, and eye movements, notably used in films like *Avatar* to create highly realistic CGI (Computer Generated Images) characters. Cameron fosters a culture where risk-taking and failure are celebrated as essential steps toward innovation, encouraging his teams to think outside the box and bring unconventional ideas to the table.

In *Avatar*, the way of water required water effects for 2,225 shots, some taking up to eight days of simulation to achieve the high resolution needed. There were also numerous scenes where water interacted with over 50 creatures in a single shot. This presented the challenge of needing simulations to be accurate at scale, from large domains for bigger creatures, to submillimeter resolution for thin film on skin. As it was not

computationally feasible to create a single-representation water system, the toolset was developed with several distinct solvers to keep compute times to a minimum.

James Cameron chose the cameras used in *Avatar* the Way of Water primarily for their ability to deliver top-tier image quality and to meet the unique demands of shooting in 3D and underwater environments. The Sony Venice cameras were selected because they offer exceptional digital image quality and flexibility, essential for capturing the detailed visual effects-heavy scenes and virtual production elements of the film. To achieve the film's groundbreaking underwater sequences, Cameron collaborated with Sony to develop a specialized system that splits the camera into separate sensor and processing units connected by a tether. This innovation allowed the camera to be lightweight and compact enough to operate underwater without sacrificing image quality. Additionally, the DeepX 3D beam splitter rig, using Nikonos underwater lenses, was employed to capture native 3D IMAX footage underwater, overcoming traditional challenges like distortion and bulkiness of underwater camera housings.

Cameron's use of a beam splitter rig combining two Sony Venice cameras allowed precise control over stereoscopy, enabling the cameras to be positioned very close together or even overlapping to avoid unnatural effects like miniature or gigantic appearances of subjects. This setup also made the 3D camera system more manageable and versatile, allowing for dynamic handheld shots and complex movements in both virtual and physical environments and a 40-year-old woman in the *Avatar* movie, as per the *Avatar* Wiki, is portrayed by the actress Sigourney Weaver. Her character name is Dr. Grace Augustine. She is an exobiologist and the head of the *Avatar* Program in the film.

Theoretical Framework

Technological Determinism Theory, as proposed by Marshall McLuhan in 1964, posits that technology specifically media technology plays a central role in shaping human behavior, culture, and societal structures. McLuhan suggested that technologies of mass media facilitate cultural diffusion within society, leading to changes in human attitudes and actions. His famous quote, "shape our tools, and they in turn shape us," encapsulates the idea that as humans create technologies, those technologies subsequently influence and determine how we live and interact. The content of a new medium is often the form of the previous medium, meaning technological evolution builds upon itself. The medium fundamentally shapes the message and thus the social environment and human perception. According to McLuhan, society adapts to the qualities of the media they use, shaping collective experience and behavior uniformly across users. The theory is often considered deterministic because it implies that technology largely governs societal change and human behavior, often downplaying the role of human agency or social factors independent of technological influence. It is a foundation of media ecology, exploring how media environments affect culture and society.

The Creative/Artistic Concept in the Film *Avatar* as Produced by James Cameron

James Cameron is a Canadian director, producer, editor, screenwriter, and inventor, best known for his blockbuster films like *The Terminator*, *Titanic*, and *Avatar*. Born in Kapuskasing, Ontario, in 1954, he was raised in Niagara Falls, where his interest in filmmaking was sparked by watching *A Space Odyssey* in 2001. He later pursued physics and film technology, eventually working his way up from special effects to art direction to directing.

Avatar follows Jake Sully, a paraplegic ex-Marine who replaces his deceased twin brother in the *Avatar* Program on the moon Pandora. Using a genetically engineered Na'vi-human hybrid body called an avatar, Jake explores Pandora's lush environment and its native Na'vi people. Initially sent to gather intelligence for a mining corporation seeking a valuable mineral, Jake grows to respect the Na'vi and falls in love with Neytiri, a Na'vi princess. Torn between his orders and his new home, Jake leads the Na'vi in a battle to protect Pandora from human exploitation and destruction.

Young Cameron didn't know it at the time, but a simple act he did back in the 70s saved him from a lot of headaches that would come when the franchise finally kicked off. After he had the dream, he decided to do some drawings that became early concepts of the franchise. Cameron also knew it wouldn't be an easy project to bring to life, so first he had to establish himself as a hitmaker before a studio would trust him to tell the story of blue aliens fighting for their homeland. And it all according to Errick Massoto:

I woke up after dreaming of this kind of bioluminescent forest with these trees that look kind of like fiber-optic lamps and this river that was glowing bioluminescent particles and kind of purple moss on the ground that lit up when you walked on it. And these kinds of lizards that didn't look like much until they took off. And then they turned into these rotating fans, kind of like living Frisbees, and they come down and land on something. It was all in the dream. I woke up super excited and I drew it. So, I have a drawing. It saved us from about 10 lawsuits. Any successful film, there's always some freak with tinfoil under their wig that thinks you've beamed the idea out of their head. And it turned out there were 10 or 11 of them. ...and so, I pointed at this drawing I did when I was 19, when I was going to Fullerton Junior College, and said, See this? See these glowing trees? See this glowing lizard that spins around, that's orange? See the purple moss? And everybody went away (np).

The characters in *Avatar* were brought to life using groundbreaking performance-capture technology developed by James Cameron and his team. Each actor also wore a lightweight head rig with a tiny high-definition camera positioned inches from their face, recording every subtle facial expression and muscle movement. This facial data was mapped onto the digital characters, allowing the Computer Generated Na'vi to display a full range of human emotions and nuanced performances.

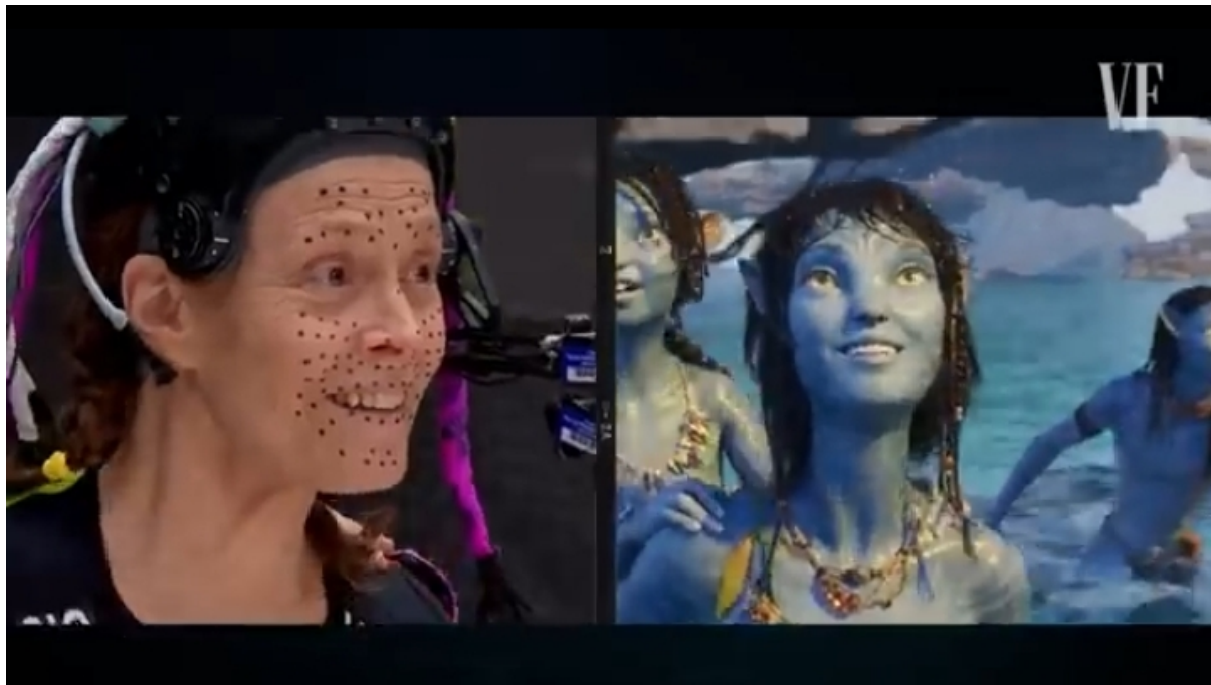


Plate 1: Actors wore bodysuits with reflective markers tracked by up to 140 cameras to capture their movements in 3D space, this interpreted the impact of heavy technology tools used in *Avatar*. Source: James Cameroon



Plate 2: The shooting location and technological outcome in *Avatar*. Source: James Cameron.

Cameron preferred the term "performance capture" over "motion capture" because the actors' full performances—including facial expressions—were directly recorded rather than animated separately. Additionally, a virtual camera system allowed Cameron to view and direct the CGI characters and environments in real time, as if filming live actors on set. This combination of advanced facial capture, body tracking, and virtual cinematography made the Na'vi characters feel emotive and lifelike, revolutionizing how digital characters are created in film.

James Cameron's Insight on AI

Artificial intelligence machine is invented to exhibit the actions of human or animals, scientifically develops through computer science field of study. The use of artificial intelligence is basically cutting across all segments and fields of study, it is conspicuous that the movement of Artificial intelligence is technically vast and engaging in our society. Theatre practitioners and film makers are also directly maximizing the use of Artificial intelligence in the making of their work, most especially some western film such as *Avatar*, *The Terminator*, *Titanic* and *Black panther* are heavily produced with Ai. According Boz' future Podcast:

Artificial intelligence as a creative assistant that enhances filmmaking efficiency without replacing human artists. He believes generative AI can double the speed of completing complex visual effects shots, allowing artists to focus on more creative tasks rather than tedious technical work (Youtube interview 29th May 2025).

From James Cameron's view theatrical and film making prowess through the involvement of Ai has a way in building and enhancing creativity with the aim of vehement productivity without stress in order to replace human theatre practitioners. In the case of artificial intelligence, deducing from James Cameron's work

Avatar, the fate of theatre performance and Ai especially in Nigeria theatre practitioners and film makers is to adopt training programs, collaboration with tech experts, exploring new formats, innovative productions, balancing AI and human creativity, focusing on unique human strengths, embracing technological advancements and addressing challenges. Economic Time Publication asserts that AI should streamline processes and automate and even add to certain elements of the film making process, Cameron said the essence of storytelling fundamentally relies on human emotions, experience, and imagination that cannot be replicated by machines (np).



Plate 3: Artificial intelligence manipulation in action in the film *Avatar*.
Source: James Cameroon



Plate 4: The use of Artificial Intelligence on the Pandora planet to make the unreal realistic. Source: James Cameroon



Plate 5: The Sophisticated scenario on the pandora planet easily actualized with the influence of Artificial intelligence. Source: James Cameroon

The advantage of AI generating system in theatrical world or film making is purposely to make the production less demanding and expensive without too much stress. The place of the machines is fundamentally to assist in the field; the system of AI cannot create emotions and deep traits that human factors do in storytelling. According to Economic Time Publication:

Cameron emphasizes that AI should double the speed of completing complex visual effects shots, allowing artists to focus on more creative work rather than cutting jobs. Cameron stresses that while AI can enhance production efficiency, it cannot replicate the emotional depth and originality essential to storytelling, maintaining that human creativity remains irreplaceable (np).

On the other hand, film makers and theatre practitioners need to focus their gaze on implementing technology and innovations into their artistic concepts in projecting scientific fictional concepts. According to Cameron stated affirmatively that, “I am fascinated by technology, how it shapes our world, where it's headed, it's impact on society and I've pushed tech boundaries myself as a means to my storytelling.” (Youtube 25th May 2025).

From the above statement, Cameron who is a director and film maker doesn't demean the place of technology and Artificial intelligence in his film making production which he believed strongly on the impact of storytelling in collaborating with Artificial Intelligence on the society. Cameron uses AI to streamline production processes, enabling faster and cost-effective filmmaking. In line of this Cameron emphatically explain that “So, this fusion of AI and robotics that's happening right now is one of the most thrilling technological leaps of my lifetime. We are no longer just building machines that execute, command, we are designing systems that can learn, adapt and even evolve on their own” (Youtube 28th May, 2025).

AI and robotics in film makings mark the technological shift in the world, most especially in theatre and film production. for example, AI as a tool to streamline production, particularly in visual effects, allowing filmmakers to focus on higher-level creative tasks. Ai can fill in the details of complex CGI (Computer Generated Images) enabling artists to develop grander visions without being bogged down by minutiae.

For instance, in *Avatar*, Cameron's team used advanced simulations for water effects, demonstrating how AI-driven tools can push artistic boundaries.

The Future of Nollywood and AI

Nollywood is a Nigeria-based film production that encompasses the conglomeration of the Yoruba, Igbo, Hausa, Igala, Idoma, etc. Nollywood, Nigeria's vibrant film industry, has a rich history dating back to the colonial era when filmmakers produced films for local audiences. Nigerian cinema started in the 1920s and 1930s with films like *Palaver* in 1926 and *Sanders of the River* in 1935, showcasing Nigerian actors in speaking roles. Religion played a significant role in cinema culture, with Christian missionaries using filmmaking for propaganda. After Nigeria's independence in 1960, the film industry grew rapidly, with new film theatres emerging and foreign films dominating the market. The Indigenization Decree of 1972 mandated that 300 film theatres be given back to Nigerians, leading to more local participation in filmmaking. The 1990s saw a surge in video film production, with Alaba International Market in Lagos becoming a hub for video distribution. This era saw the rise of video rental clubs and a significant increase in film production, with over 6,000 registered video parlours and estimated annual sales revenue of 522 billion naira (\$3 billion) in 2007.

The cinema industry experienced a resurgence in the 2000s, with the emergence of new filmmakers and the construction of modern theatres in affluent cities. Films like *The Figurine* in 2009, *Ijé* in 2010, and *The Wedding Party* in 2016 showcased greater narrative complexity and production quality. The rise of streaming services like IROKO TV, Netflix, and Amazon's Prime Video has transformed the industry, providing new distribution channels and opportunities for filmmakers to reach a global audience. Netflix has committed \$23.6 million to locally produced content, and the industry is expected to generate \$1 billion in export income.

Today, Nollywood is a \$6.4 billion industry, with a global presence and acclaim for its dynamic storytelling and cultural richness. While there are challenges to overcome, the industry's future looks bright, with increasing investment and a growing audience worldwide. According to Oluseun Olorunjueda, Oluseye Abiodun Babatunde, and Fatonji Stephen posits that:

As technology continues to advance, filmmakers in Nigeria have embraced technology in some major aspects of film production, and these aspects of production are usually technical in nature. there have been major improvements from the point where filmmakers in Nigeria embraced sophisticated cameras that were designed to give a cinematic look that the TV and cinema screen in Nigeria change in its outlook, and audiences in Nigeria love the look and feel of those movies when they watch (19).

Nollywood filmmakers despite the current wave of Artificial intelligence in some sector like Academy, Business, Organizations, sport etc. AI is being utilize as an aided instrument to avoid long miles journey in these areas. Nigeria Filmmakers used minimal technological system most especially the technical aspect in some movie production like *Merryman* 1 and 2.

The Nollywood industry in Nigeria and Filmmakers need to fully transit into the use and implementation of Ai and high technological devices in complementing their creative storylines, concepts and film productions. However, invented machines can be arranged to replace human activities in filmmaking especially in actualizing critical scenario because Ai does not get tired and sleep like human, this can encourage increased in efficiency, cost savings, and enhanced storytelling capabilities, automate tasks, improve editing, and freeing up human filmmakers to focus on more creative aspects of the process. All these can be actualized if Nigeria filmmakers consults and collaborate with technological expert in Ai and Robotics studies in film making. According to Skill Lync:

Today, movies are a technical battlefield that requires engineers trained in specific skill sets that can help convert the vision of dreamers like James Cameron into reality. Movies today generate vast amounts of data that need to transport from the camera to the studios, where artists work their magic adding CGI (Computer Generated Images) elements to the story. These require data scientists and engineers working on 5G networks to provide reliable transmission for studios (np).

This collaboration can be deduced from Cameron's work even though, He is a scientist yet work with other experts such as Alexey Stomakhin, Joel Wretborn, Kevin Blom and "individuals from Wētā Digital, Wētā FX, and various academic institutions. Nollywood filmmakers should know that in transiting to this movement of collaborating with diverse scientists' experts in film making, the name Nollywood will not just be limited to Nigeria and a few countries but gain world recognition, recommendation, commendation by infusing Ai elements in movie Production. The Nigeria film makers can also collaborate with the Government, international company and organizations for funding, this can make our film to feature international our Awards and draw the whole world to Africa.

Conclusion

Cameron's creative concept presents a balanced and implementing artificial intelligence as a transformative yet collaborative force in arts and science. According to findings Artificial Intelligence should serve as a powerful assistant accelerating creative workflows without replacing the uniquely human elements of emotion and spontaneity-resonates deeply within the context of theatre performance. As Artificial Intelligence technologies continue to revolutionize, they offer exciting opportunities to enhance creativity, streamline production, and engage audiences in innovative ways. However, preserving the irreplaceable human connection and emotional depth that define live theatre remains important. This careful balance will shape the future of theatre, ensuring it remains original, vibrant, emotionally resonant art form in the digital age.

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