Academic Journal of Natural Science
Journal Home: http://ajns.suaspress.org | CODEN: AJNSAE
Vol. 2, No. 1, 2025 | ISSN 3078-5170 (Print) | ISSN 3078-5189 (Online) | ISSN 3078-5197 (Digital)

Enhancing Media Convergence with Artificial Intelligence to Stabilize Financial Markets

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Abstract: This study explores the application of artificial intelligence (AI) technology in media convergence, focusing on how AI is driving deep integration of media and financial markets through big data analytics, AIGC (AI-generated content), and intelligent communication technologies. Ai-driven sentiment analysis and fake news detection tools effectively solve the problem of information asymmetry and the spread of false news in the financial market and promote market stability and transparency. Through personalized recommendations and intelligent communication, AI provides users with a more accurate content experience and improves user engagement and satisfaction. In addition, the rapid development of AIGC and big data ecology has promoted the intellectualization of information dissemination and public opinion analysis, providing more forward-looking support for financial market decision-making.

Keywords: Artificial Intelligence (AI), Media Convergence, AIGC (AI-Generated Content), Sentiment Analysis and Fake News Detection.

Disciplines: Computer Science. **Subjects:** Artificial Intelligence.

DOI: https://doi.org/10.70393/616a6e73.323531 **ARK:** https://n2t.net/ark:/40704/AJNS.v2n1a01

1 INTRODUCTION

Artificial intelligence (AI) technologies are profoundly transforming the communication practices of journalism and reshaping human lifestyles, influencing both the depth and breadth of media convergence. In recent years, the rapid advancement of emerging technologies, represented by AI and big data, has significantly accelerated innovation in the media industry[1]. Applications such as AIGC (AI Generated Content)-driven intelligent advertising, computational public opinion analysis, and smart governance exemplify the tangible progress of AI in driving deeper media integration. These technologies are enhancing media capabilities and enabling synergies that promote comprehensive digital convergence. However, the adoption of AI in media convergence is not without challenges.

Risks such as the proliferation of fake news, privacy breaches, intellectual property infringements, and ideological tensions pose substantial concerns. These issues highlight the need for robust governance frameworks and ethical considerations as technology evolves. AI technologies, particularly those driven by AIGC[2], will undergo accelerated iterations, ushering media convergence into an intelligent era. This evolution presents significant opportunities for stabilizing financial markets, where integrated AI-driven media platforms can provide accurate, real-time insights to mitigate uncertainty, foster transparency, and support informed decision-making.

2 MEDIA CONVERGENCE AND THE CURRENT STATE OF FINANCIAL MARKETS

The Convergence theory postulates that progress in technology causes the convergence of independent media platforms, which is a basic determinant in understanding media convergence. In essence, the theory refers to the flow or movement of content across the different media channels brought about by digital technology[3-4]. The design makes a great demand based on the convergence theory for the creation of flexible and cross-media content to ensure consistency in user experiences, notwithstanding the medium. Designers have to know how to synergistically make use of the various formats of media to create more engaging and holistic user experiences.

2.1 THE KEY ROLE OF THE MEDIA IN FINANCIAL MARKETS

In the existing literature that explores the role of social

media in financial markets, studies highlight the importance of attention allocation by investors. Hirshleifer and Teoh (2003) and Hirshleifer et al. (2011) argue that due to the scarcity of cognitive resources (Kahneman, 1973), investors must allocate attention efficiently to encode and process information signals. Yuan (2015) further demonstrates that market-wide attention events predict investors' trading behaviors[5]. However, on social media platforms, the attention allocation process differs significantly due to the vast volume of information. For instance, Twitter's Cashtags service and investor-oriented platforms introduce challenges in identifying firm-specific signals amidst multiple hashtags.

The paper by Diao et al. (2024) [6]on "Research on Cancer Prediction and Identification based on Multimodal Medical Image Fusion" explores the application of advanced machine learning techniques to enhance cancer diagnosis through the fusion of multimodal medical images. This approach leverages deep learning algorithms to combine various imaging modalities (such as CT, MRI, and PET scans) to improve the accuracy of cancer prediction and identification. The fusion of these images enables a more comprehensive understanding of the tumor's characteristics, leading to more reliable and timely diagnoses.

In the context of Enhancing Media Convergence with Artificial Intelligence to Stabilize Financial Markets, the methods discussed in Diao et al. [7](2024) offer relevant insights for applying AI and data fusion techniques to financial systems. Just as the integration of multiple imaging sources enhances the diagnostic power in medical applications, integrating diverse data sources in financial markets—such as real-time trading data, news, and social media content—can provide a more robust and precise picture of market trends. Using AI to analyze this multimodal data can help stabilize financial markets by predicting volatility, identifying emerging risks, and developing informed investment strategies. This convergence of AI with multiple data streams is pivotal in achieving greater market stability, just as multimodal image fusion improves medical diagnosis.

Recent advancements in artificial intelligence (AI) offer innovative solutions to address these challenges. AI and big data analytics can monitor social media and news platforms in real time, enabling the identification of market sentiment (sentiment analysis) and the detection of misinformation. [8-10]For example, natural language processing (NLP) techniques can analyze Twitter data or financial news to extract keywords, evaluate sentiment, and predict market behavior. Such AI-driven sentiment analysis allows for the construction of predictive models that anticipate market volatility and assist investors in making rational decisions. By filtering noise and recognizing significant information signals, AI can mitigate the impact of rumors and misinformation, reducing the likelihood of market panic.

This study leverages these AI tools to clean and analyze Twitter datasets, following methodologies outlined by Evans et al. (2019)[11-13], to predict investor trading behavior. Building on Kahneman's (1973) framework, where attention is the key resource for encoding market signals, we incorporate AI-driven sentiment analysis to enhance the efficiency of attention allocation in financial markets.

2.2 AI AND ML THEORIES RELEVANT TO MEDIA

Theories related to AI and ML are rooted in attempts to gain insight into the ways through which intelligent systems can be of help in upgrading the design of media. The AI theory simply has to do with the fact that human intelligence is simulated in machines, giving them the ability to perform such things that require cognitive functions like perception, reasoning, and learning. ML theory has to do with the development of algorithms that will let a system learn from data to make predictions [14-16]. All of these theories are put into effect in media design to form a more tailored and perfected user experience. For instance, AI would analyze user data to suggest content based on personal preference, while ML would automate video editing or render in real-time complex design tasks. Knowing these theories, designers can create more dynamic and interactive media experiences that exploit AI and ML to improve the user experience. The paper by Xu, Wei, Chen, and Xiao (2024) [17]introduces a hybrid price forecasting model for the stock trading market that combines artificial intelligence techniques to improve prediction accuracy. The authors integrate multiple AI methods, such as machine learning algorithms and deep learning models, to predict stock price movements more effectively. By leveraging both historical trading data and real-time market signals, their hybrid model aims to capture complex market behaviors, providing more reliable forecasts. The model’s ability to adapt to changing market conditions and identify hidden patterns in financial data makes it a powerful tool for enhancing stock trading strategies.

This work aligns with the growing trend of applying AI to financial forecasting, demonstrating how advanced algorithms can be integrated to handle the dynamic and volatile nature of financial markets[18-21]. Similar to other AI-driven approaches, the hybrid model's effectiveness underscores the potential for AI to enhance decision-making processes, ultimately contributing to more informed trading strategies and better risk management.

There is a huge demand for pedagogies to work with tools driven by AI and to work with algorithms of ML[22]. Courses on basic knowledge about AI and ML, with a focus on their use in media design, should be taught to students. Students should be in a position to learn the running of these technologies in user data analysis, content personalization, and automation of design tasks. Backed by convergence theory, AI, and ML theories and design principles, convergent media is allowed fertile ground on which further learning and innovation can take place. Following interdisciplinary curricula through problem-based learning, collaborating environments, and making use of AI and ML in

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education will prepare the new generation of designers to work within the dynamic and converging media landscape of today[23]. These approaches assist designers with the acquisition of skills and knowledge that can be applied in the development of multimedia platforms featuring seamless user experiences that are engaging and interactive.

2.3 Media Convergence and the Disadvantages of Financial Markets

2.3.1 False News and Information Asymmetry as Drivers of Market Volatility

In the financial market, where information flows rapidly, false news and information asymmetry are significant factors contributing to market volatility. Fake news, often spreading rapidly through social media and other channels, can trigger market panic or irrational investor behavior. For example, a false report about a company's bankruptcy may lead to a sharp decline in stock prices, causing substantial losses for investors and market instability[24]. Similarly, information asymmetry prevents some participants from accessing accurate and timely information, creating decision-making blind spots that further exacerbate market uncertainty.

With the rise of new media, a clear distinction has emerged between traditional and digital platforms in content production and dissemination. While new media platforms offer fast transmission and wide coverage, their weaker content review mechanisms often lead to the proliferation of low-quality or false information[25-27]. In contrast, traditional media provide more reliable content but suffer from cumbersome editorial processes and poor timeliness, failing to meet the real-time information needs of financial markets. This imbalance complicates the ability of market participants to obtain timely, authoritative information, thereby increasing market uncertainty.

2.3.2 Leveraging AI to Combat False News

AI technologies offer powerful tools to address these challenges by improving the accuracy and reliability of information in financial markets[28]:

Content Verification with AI: Deep learning and machine learning models can be applied to verify the authenticity of news content. By analyzing textual data, sources, and dissemination patterns, AI can filter out false or misleading information, ensuring the accuracy of financial market data.

Real-Time Monitoring and Stability: AI systems can monitor the spread of false information across social media and communication platforms in real time. By analyzing its dissemination path and potential impact, AI helps mitigate market volatility caused by misinformation[29]. This ensures that market participants make informed, rational decisions, stabilizing price fluctuations.

Practical Application For example, AI-driven tools can automatically monitor stock forums, social media platforms, and financial news feeds to detect misleading or false information. These systems can flag dubious content and issue timely alerts to investors, preventing irrational trading behavior. A notable example is the "GameStop incident," where misinformation and market speculation amplified price volatility. AI tools could help identify similar risks early, providing investors with accurate insights and preventing panic-driven market disruptions.

By integrating AI technologies into financial markets, the spread of false news can be effectively curbed, and the impact of information asymmetry can be reduced. This fosters a more stable and transparent market environment, ensuring that information accuracy remains a cornerstone of rational decision-making[30].

3 The Technology Path of Media Fusion Enabled by Artificial Intelligence

3.1 AIGC (Generative Artificial Intelligence) Applications

AI-generated content (AIGC) is a technology that uses artificial intelligence technology to generate content. In recent years, AIGC technology has developed rapidly and become a hot spot in the field of artificial intelligence. [31]AIGC is not limited to text generation but also includes images, audio, video, and other forms, which greatly expands the boundaries of content creation. This paper will deeply discuss the definition, technical principle, application scenario, and future development trend of AIGC.

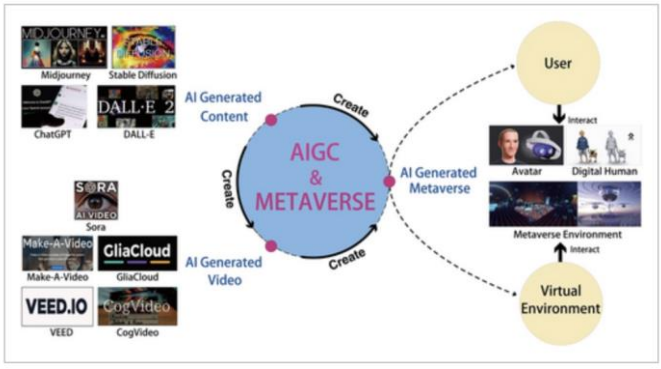

Figure 1. Related applications of AIGC in the Metaverse. AIGC, artificial intelligence generated content

AIGC (Artificial intelligence-generated content) is a new way of content creation after PGC (professional production content) and UGC (user-produced content). AIGC can create new forms of digital content generation and interaction in dialogue, story, image, video, and music production. It can be used in media, e-commerce, film and television, finance, medical and other industries.

AIGC is not only a kind of content classified from the perspective of content producers, but also a kind of content production mode, and a kind of technology collection for automatic content generation. Its rise stems from the rapid breakthrough of deep learning technology and the growing demand for digital content supply. [32]The international equivalent term is "artificial intelligence synthetic media", which is defined as "a general term for the production, manipulation, and modification of databases or media by artificial intelligence algorithms".

3.2 Big Data and Computational Public Opinion Analysis

Big Data is an area that has received a lot of attention in recent years. The use of new digital tools, the continuous update and iteration of information systems, and the advancement of data collection technology, these factors have led to the emergence of massive data. The ensuing Big Data Analytics (Big Data Analytics), and the rise of Artificial Intelligence (AI) technology in recent years have both crossed and complemented, jointly promoting the promotion and application of big data and related technologies in economic and social life. A big data ecology covering all aspects of economic and social operation has been formed. This ecology is influencing and reshaping the entire process of public policy formulation and implementation, including the process by which central banks (" central banks ") use monetary policy tools to control interest rates and the money supply in order to achieve the ultimate goals of monetary policy, such as full employment and price stability.

Research methods that use artificial intelligence (AI) algorithms to collect, process, and analyze massive amounts of data in a specific discipline (X), and make predictions based on this to obtain scientific discoveries. Compared with traditional research methods based on experiments or logical reasoning, AI+X data-driven research can make use of the powerful computing power of AI algorithms to efficiently conduct big data analysis, with the advantages of high input-output ratio and wide application range. AI+X data-driven research has been widely used in various fields, using AI algorithms to study genetic data for early cancer screening is one example. There are thousands of data of genome and cancer patients, and it is difficult to realize objectively by using traditional scientific research methods to analyze them, which involves a large amount of engineering and cumbersome process.

However, with the help of the convenient tool of AI algorithm, life scientists can establish a database based on massive genetic information of patients, compare with previous research results, quickly and accurately find rules and establish connections between the two, so as to make it possible to "standardize" cancer diagnosis.

3.3 Intelligent Communication and Personalized Recommendation

Machine learning becomes critical to any personalization of media content. It works by trying to meet the taste of the individual user. In other words, ML algorithms analyze user data and make predictions based on that information of what might interest each user. Such a personal approach increases engagement and raises user satisfaction by offering every user content tailored to his tastes and behaviors. For designers, this means knowing how to harness machine learning for personalization. It is on them to create flexible design frameworks, which in turn will dynamically change based on different user profiles so that the consistency and personalization of user experience is maintained across all platforms.

NLP joined forces with voice recognition technologies and changed the ways users interact with media. NLP enables a computer to understand and respond to human language, providing more natural ways of interaction. Speech recognition, a subdomain of NLP, allows for device control and access to content through spoken commands. These technologies are increasingly being accommodated within media design to come up with experiences that are accessible and easy to use. For example, designers come up with voice-activated interfaces and conversational agents supporting informational, entertainment, and assistant projects to make the experience of media applications more interactive and inclusive.

Other breakout areas in media design include AI- and ML-driven image and video analysis, which enable the easier way of automatic recognition, tagging, and categorization of visual content, hence organizing it for easier retrieval. AI-driven image and video analysis will further enhance such content by auto-enhancing quality, detecting objects, and generating metadata. This capability is of particular value in applications such as social media, where vast amounts of visual content get uploaded every day. Designers have to use tools to scale content management processes and build more engaging and interactive visual experiences.

4 CONCLUSION

The integration of AI technologies into media convergence holds transformative potential for reshaping the communication landscape and enhancing financial market stability. As AI-driven tools, such as AIGC, big data analytics, and intelligent recommendation systems, continue to mature, they will redefine the depth and breadth of media interactions. By leveraging real-time sentiment analysis, misinformation detection, and personalized communication, AI empowers media platforms to improve information accuracy, reduce market volatility, and foster transparency. The advancements in AI technologies provide critical support for financial market participants by filtering through vast information flows, identifying actionable signals, and enhancing rational decision-making processes.

Looking ahead, AI-enabled media convergence will accelerate the shift toward a fully intelligent era characterized

by synergistic integration across platforms, industries, and user experiences. Future developments will focus on creating ethical frameworks to address challenges such as false information, privacy risks, and intellectual property concerns, ensuring responsible AI implementation. In financial markets, AI-driven intelligent communication and big data analysis will continue to provide timely, reliable insights to stabilize global economies, offering opportunities to mitigate uncertainty, enhance user trust, and unlock new pathways for innovation.

ACKNOWLEDGMENTS

The authors thank the editor and anonymous reviewers for their helpful comments and valuable suggestions.

FUNDING

Not applicable.

INSTITUTIONAL REVIEW BOARD STATEMENT

Not applicable.

INFORMED CONSENT STATEMENT

Not applicable.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Not applicable.

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