# Postprint: Integration of Computer Technology and New Media

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## Abstract

The rapid development of computer technology and the widespread application of Internet technology have profoundly transformed people' s lifestyles, while also altering the forms of media communication and thereby giving rise to new media. The integration of computer technology and new media has not only changed the operational models of traditional media and information dissemination methods, but has also promoted the diversity of media communication. The rapid development of new media and the explosive growth of its audience have, in turn, further propelled the advancement of computer technology. This paper elaborates on the characteristics of new media, analyzes the influence of computer technology on media communication, explores the new communication forms generated by emerging technologies and the future development trends of new media, and finally discusses the methods and significance of the integration between computer technology and new media.

## Full Text

## Preamble

**The Integration of Computer Technology and New Media**
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**Abstract:** The rapid development of computer technology and the widespread application of internet technology have profoundly transformed people' s lifestyles and the forms of media communication, giving rise to new media. The integration of computer technology and new media has not only altered the operational models and information dissemination methods of traditional media but has also promoted diversity in media communication. The rapid growth of new media and its explosive audience expansion have, in turn, further propelled advances in computer technology. This paper elaborates on the concept and characteristics of new media, analyzes the impact of computer

technology on media communication, explores new communication forms emerging from technological innovations and future development trends of new media, and finally discusses the methods and significance of integrating computer technology with new media.

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### 1.1 What is New Media?

There is currently no definitive consensus on what constitutes new media. Some categorize platforms like iQiyi, Mango TV, and IPTV as new media, while others include Douyin, Kuaishou, and WeChat in this classification. Indeed, the vast majority of self-media operations today rely on new media as their primary communication tool. So what exactly is new media?

New media is a relative concept, defined in contrast to traditional media, and it remains a dynamic notion. Scholars and institutions both domestically and internationally hold various perspectives on its definition. The renowned American technology magazine *Wired* defines new media as "communications for all, by all," suggesting that everyone can become a media outlet. While this captures an essential characteristic of new media communication, it does not constitute a rigorous definition in the strict sense. Professor Xiong Chengyu from Tsinghua University' s School of Journalism and Communication argues that contemporary new media encompasses media forms that have emerged and exert influence based on computer information processing technology, including online media and other digital media formats. This represents a relatively broad and flexible concept. Li Ruigang, President of Shanghai Media Group, similarly views new media as a relative concept referring to new media forms that have developed after traditional media.

The author contends that new media represents media forms distinct from previous communication modalities. Whereas information was once disseminated primarily through radio, television, and newspapers, we now have multiple channels including Weibo, WeChat, various self-media platforms, and other communication forms. As computer and digital technologies continue to evolve, future media forms will inevitably emerge to replace current new media. The new media discussed in this paper refers to emerging media forms developed under present conditions of computer technology and network communication technology.

### 1.2 Characteristics of New Media

The primary characteristics of new media include immediacy and interactivity, diversification and pluralization, fragmentation and sharing. These manifest in instantaneous communication speeds, interactive communication processes, diversified communication channels and subjects, pluralized content forms and communication methods, and fragmented communication nodes and reception times. In the new media era, both public media and self-media can simultaneously push different information to audiences through various platforms. For instance, the author' s own converged media center can broadcast its radio programs via FM transmission while simultaneously streaming them visually to the public through apps, Douyin, WeChat official accounts, and video channels, with the capability to integrate into digital television systems for broader coverage. During live broadcasts, real-time interaction with users is possible through communication tools like WeChat and telephone. Audiences can directly participate through interactive methods and rapidly disseminate content by sharing livestream links via WeChat Moments and Weibo, making each audience member both a receiver and a transmitter of information, thereby amplifying communication effectiveness. New media content forms are diversified, capable of simultaneously transmitting information that integrates text, images, audio, and other formats, which enhances both the volume of information transmitted and the breadth and depth of communication. As the pace of life and work accelerates and mobile devices become universally accessible, people' s leisure time increasingly exhibits a fragmented pattern—a demand that new media precisely satisfies. Additionally, new media resources are shareable; on the internet, people can independently download needed resources while also uploading their own.

## 2. The Impact of Computer Technology on Media Communication

The emergence of new media has been made possible by the rapid development of computer technology and the internet. The influence of computer technology on media communication extends far beyond communication forms and speeds, affecting multiple dimensions.

### 2.1 Impact on Communication Methods

Traditional media such as radio, television, and newspapers are often constrained by time, space, and geography during information dissemination. New media, leveraging computer and network technologies, breaks through these limitations. Traditional media, restricted by their communication carriers, experience certain time lags in information collection and release, with some information losing its timeliness during the production process. They are also limited by space and geography, resulting in very restricted communication scope. In contrast, new media can utilize network apps, social circles, Weibo,

and other platforms to acquire and publish the latest information in real time, unrestricted by time or space. This cross-spatiotemporal communication method is incomparable to traditional media. The establishment and deployment of China' s new-generation mobile communication networks have rendered the era of traditional internet dependence on computer terminals obsolete, ushering in an era of convergence between mobile communication networks and the internet. Wherever network coverage exists, people can freely use internet-based new media to receive and disseminate information. The universally popular smartphone has become the most convenient mobile communication carrier, enabling people to access information anytime, discuss current events, and participate in online exchanges and interactions.

### 2.2 Impact on Information Storage

Traditional media typically use newspapers, radio, or television as communication carriers, but these methods lack effective storage space for information. Network-based new media built upon computer technology can utilize big data, mobile internet, and cloud storage functions to achieve information flow storage and optimization. With modern storage technologies, new media can not only permanently preserve information content but also accurately record when information occurred and its dissemination pathways. This enables rapid information retrieval and queries using keywords, as well as repeated reading and data tracing, all unrestricted by time or space.

### 2.3 Impact on Communication Costs

Communication costs encompass both the human, material, and financial resources expended by media organizations to collect and disseminate information, and the costs incurred by audiences to receive information. Traditional media must invest considerable resources to collect, process, and publish information, resulting in relatively high communication costs compared to new media. Internet-based new media can publish information for free through online platforms, significantly reducing communication costs. The method is also remarkably simple: information can be published anytime through relevant transmission platforms as long as terminal devices and network coverage are available. Consequently, everyone can become a media outlet.

### 2.4 Impact on Communication Interactivity

Traditional media typically employ one-way communication with limited interactivity, preventing audiences from publicly expressing their viewpoints and forcing them to passively receive influence from public media. New media breaks down this inequality in communication. It facilitates multi-channel and diversified interaction with audiences, transforming information transmission into free dialogue. Audiences can use computers, mobile phones, and other terminal devices to freely express their comments and opinions on hot news through online platforms provided by network media. This not only enhances public attention

to hot news but also increases the volume of information dissemination. Typical examples include online education platforms, the comment sections of *NetEase News*, and bullet comments on video-on-demand platforms, all of which satisfy the public' s desire for learning, entertainment, and online interaction through internet-based communication methods.

### 2.5 Impact on Communication Immediacy

Immediacy represents a crucial characteristic of new media, leveraging the convenient and rapid technical advantages of internet communication. New media content can be updated in minutes or seconds, whereas traditional radio and television content requires updates calculated in hours or days, and newspapers and journals in days or weeks. New media can release news within the first moments of an event and rapidly disseminate it across different network platforms to every corner of the world. Traditional media must undergo certain production and distribution cycles, and while this ensures content quality, it increases information transmission time. Compared to traditional media, the immediacy characteristic of new media is fully demonstrated, making it the preferred carrier for information dissemination.

## 3. Types of Computer Technologies Affecting and Transforming New Media

Future computers will possess greater intelligence components, including certain thinking and judgment capabilities, logical reasoning, natural language processing, and various perception abilities. Innovations such as DNA computers, nanocomputers, and quantum computers may eventually emerge. However, at present, the computer technologies that the author believes are primarily affecting and transforming new media include the following categories.

### 3.1 Artificial Intelligence Technology

In recent years, artificial intelligence technology has been widely applied in the media communication field and is demonstrating an intelligent development trend. On August 8, 2017, when a 7.0-magnitude earthquake struck Jiuzhaigou, Sichuan, the China Earthquake Networks Center (CENC) robot published a 540-word article with four images [Figure 4: see original paper] in less than half a minute. Some television stations have already launched virtual anchors and intelligent hosts to replace traditional human presenters. For example, "Shenya," the virtual anchor officially launched by Shanghai Television during the third China International Import Expo in 2020, was created by integrating optical capture and AR shooting technologies, providing audiences with a cross-screen interactive experience. Most converged production systems currently used by media centers (with functions including audio-video storage, editing, retrieval, and distribution) incorporate artificial intelligence technologies such as intelligent speech and semantic recognition, as well as intelligent image and video

retrieval. Douyin, a recently popular short-video app, also utilizes intelligent algorithms and artificial intelligence technology to infer user preferences and recommend content, thereby enhancing user stickiness.

### 3.2 VR and AR Technologies

VR (Virtual Reality) technology provides users with immersive experiences through panoramic video. For instance, the Auto Home app' s panoramic car viewing function allows users to experience both interior and exterior vehicle scenes on their mobile phones, and the Beike app' s VR function enables customers to view properties online anytime and anywhere. The application of VR technology offers new media novel communication perspectives and methods, making audiences feel less like "outsiders" and more like "eyewitnesses at news scenes." On the thirtieth anniversary of the Chernobyl nuclear disaster in 2016, NetEase attracted a large audience by adopting VR panoramic video as a unique reporting method. VR has become more than just a technical form; it is increasingly becoming a news reporting method favored by media organizations.

AR (Augmented Reality) technology seamlessly integrates the real and virtual, presenting them to human vision to create human-computer interaction and achieve sensory experiences beyond reality. The studio system currently used by Shanghai' s Chongming District Converged Media Center employs AR scene fusion technology to facilitate real-time interaction between hosts and virtual images. As AR technology matures and costs decrease, the combination of AR with mobile phones brings audiences refreshing experiences in both visual presentation and interactive methods.

### 3.3 Big Data and Cloud Computing

New media can also leverage big data technology to mine, analyze, and evaluate data, using intelligent algorithms and big data analysis to identify potential hot topics of greatest social concern from massive datasets, thereby promptly understanding user needs and pushing information to users after intelligent analysis, making communication more precise. The continuously increasing volume of information data processing, growing data storage demands, increasingly diverse data formats, and widely varied receiving terminals have raised new media' s requirements for data storage capacity and processing capabilities. Cloud computing can rapidly process massive amounts of data, conveniently upgrade and expand data business systems, handle data redundancy, allocate resources and manage application platforms according to demand, and provide stable and efficient technical support for new media development.

### 3.4 Blockchain Technology

While the internet transmits information, blockchain transmits value. The application of blockchain technology in the media industry helps trace and confirm data assets for both media and users. This data traceability and confirmation

system cannot be reversed, assisting creators and investors in content tracing and copyright verification, thereby more securely achieving ecological value creation and transformation. In June 2019, Block.one, creator of the industry-renowned open-source blockchain platform software EOSIO, demonstrated a blockchain social application called Voice at the B1June event in Washington, D.C., aiming to use blockchain' s decentralized intelligent algorithms to record chat data and ensure user information transmission security.

### 3.5 Internet of Things Technology

As an extension and expansion of the internet, the Internet of Things (IoT) has ushered in an era of ubiquitous connectivity. The combination of IoT technology with new media has created various media forms, endowing media with powerful intelligent perception and information collection capabilities and extending the reach of media communication to all things. Media forms triggered by IoT are collectively referred to as MOT (Media of Things), which can be further subdivided into object-based media and object-oriented media. Object-based media refers to media forms where various intelligent objects other than humans serve as information sources, such as outdoor cameras, studio control systems, and machine news creation. Object-oriented media refers to media where various "things" other than humans serve as the audience. In the era of ubiquitous connectivity, smart homes, and even plants and animals can become information audiences. For example, smart sweepers and smart home appliances allow users to remotely access and control home conditions through mobile terminals via networks. In the IoT era, media can accomplish richer information delivery through more diversified forms, with all people and objects becoming part of a universally connected world, ushering humanity into an era where everything is media.

## 4. Future Development Trends of New Media

From "mouth and ear" to "lead and fire," and from "light and electricity" to "data and networks," every communication revolution has vastly expanded the boundaries of human cognition and profoundly impacted social life [1]. As British historian Macaulay stated, "A wave may soon subside, but the tide never stops." Nearly every major technological breakthrough profoundly changes media forms and the ecology of public opinion. From big data to writing robots, from mobile livestreaming to short videos, from virtual reality to augmented reality, technological iteration has opened infinite imagination for media form transformation, reorganizing existing structures and turning impossibilities into possibilities.

### 4.1 Macro Perspective on New Media Development

From a macro perspective, the Chinese government attaches great importance to media convergence development and is accelerating the construction of a

full-media communication landscape. The integration of traditional and new media represents an inevitable trend. Although new media possesses numerous advantages over traditional media, we must not overlook the credibility and development potential of traditional media. When computer technology merges with traditional media, the resulting media forms appear before the public in entirely new ways. While computer technology development provides new media practitioners with broader thinking and enables barrier-free information dissemination, the lack of regulatory control systems for the new media industry has exposed certain drawbacks. For example, on May 22, 2021, regarding the news of Yuan Longping' s death, CGTN, as a central media outlet, forwarded the news at 11:00 AM without truly verifying its authenticity, only to apologize to the public at 12:00 PM for the erroneous report. Although Yuan Longping did pass away at 13:07 that day in Changsha, Hunan, CGTN should seriously reflect on the consequences of its hasty reporting. The state should also improve management standards for the new media industry, strengthen revisions to existing laws and regulations, ensure the authenticity of news communication in new media while guaranteeing cybersecurity management, and promote the healthy development of the new media industry.

### 4.2 Technical Perspective on New Media Development

From a technical perspective, continuous advances in AR and VR, artificial intelligence, IoT, and other technologies are producing unprecedented changes in the new media field. New media is evolving from an era where everyone is media (the "omnimedia" age) toward an intelligent media era of human-machine interaction. The entire news production process and information communication methods are undergoing disruptive transformation. Future technological trends will certainly be universal connectivity and intelligent integration [2]. Going forward, 5G, AI, and VR will become the three major engines of new media development. 5G will focus on the transmission end, achieving high-speed mobile network connectivity and unified access; AI will reorganize the content production system, building an intelligent content production platform; VR will act on the user end, reconstructing the pattern of human-world interaction through immersive experiences and interactivity, revolutionizing reception methods, and ultimately forming a new intelligent media communication technology pattern of 5G+AI+VR. At that time, intelligent media will not merely be media but will integrate with society, greatly enhancing social automation and intelligence levels, comprehensively transforming the world, and heralding the arrival of a socialized media era.

## 5. The Integration of Computer Technology and New Media

The rapid development of computer technology and mobile communication technology has driven the continuous evolution of mobile terminal devices, with emerging applications and scenarios creating favorable conditions for new media

development. The rapid growth of new media and its explosive audience expansion have further promoted and advanced computer technology. For new media development, the integration of computer technology and new media should place greater emphasis on understanding content and meaning, using technical means to analyze and master integration methods and measures, enabling new media to continuously progress in future development.

### 5.1 Strengthening New Technology Application to Consolidate New Media' s Core Position

Every major innovation in media communication models is inseparable from scientific progress and technological innovation. In the all-media era, media must not only stand at the forefront of content production and information dissemination but should also be at the cutting edge of applying advanced technology. Amid continuous integration and development between computer technology and new media, we must enhance recognition of new media' s core position, embrace new technologies, apply them to continuously improve content production efficiency and quality, and consolidate new media' s central role. Innovative breakthroughs in computer technology have expanded media boundaries and serve as the dynamic engine for continuous changes in the media landscape. Consolidating new media' s core position is not only inevitable for technological progress, era development, and media form upgrading but also a crucial measure to satisfy people' s growing spiritual and cultural needs and maintain social harmony and stability.

### 5.2 Managing the Relationship Between "Technology" and "Content"

Regardless of technological development, media's primary attribute remains content communication, though it will employ different methods, utilize different technologies, and use different communication media to enhance user experience and achieve communication objectives. While embracing new technologies, media must also distinguish the relationship between "technology" and "content," which concerns not only media' s responsibility and mission but also its foundation for survival. Technology serves content, while content relies on technology. Technological progress never ceases, and innovative content communication continuously stimulates technological iteration and advancement. Media must not only investigate truth and transmit values but also learn to use and master technology to realize public value for society, making the application of new technology truly become a new growth point for media. The development of radio technology gave birth to radio and television, while computer technology and the internet have formed new forms of content communication media. However, regardless of how media forms may change in the future, high-quality content will always be the lifeline of media.

### 5.3 Establishing Institutional Mechanisms Adapted to New Technologies and Forms

New technology has not only changed media' s content production processes and information communication methods but has also transformed organizational forms, management structures, and operational mechanisms. Therefore, to promote new media development through new technology, we must not only enhance awareness of technological changes but also establish institutional mechanisms adapted to new technologies and forms, maintaining sufficient flexibility in management [3]. Naturally, new media development has also revealed certain drawbacks, such as the proliferation of false information online, questionable authenticity, negative impacts on social public opinion during dissemination, and even copyright infringement issues. Therefore, while promoting new media development, we must also consider social issues, strengthen supervision of new media—particularly live streaming platforms, self-media, and official accounts—and formulate and improve relevant institutional norms. Only by making new media shoulder the responsibilities of purifying the internet and conducting responsible propaganda can we accelerate the integration of computer technology and new media and strengthen their functional roles in society.

### 5.4 Upholding Development Philosophy and Strengthening Convergence Innovation Awareness

For media practitioners and managers, following the wave of integration and development between computer technology and new media requires consistently upholding and implementing a development philosophy, firmly establishing the awareness that development is paramount. Only by keeping pace with the times and firmly grasping the direction of integration between new media and new technology can media lead the trend rather than be eliminated by it. We must strengthen convergence innovation awareness, rely on new technology for content creation, enhance sensitivity to new technology, and through integration, innovation, and reconstruction, build a new content communication ecology. Media managers must ensure the rationality, advancement, and scientific nature of decision-making in the context of promoting technology-content integration, establishing a communication system rooted in content construction, supported by advanced technology, and safeguarded by innovative management. We must be people-oriented, attach great importance to audience experience and interactivity, and enhance communication effectiveness.

### 5.5 Focusing on Talent Cultivation to Enhance Convergence Competitiveness

In the process of integrating computer technology and new media, media organizations must particularly emphasize talent cultivation to enhance convergence competitiveness. Technology is the prerequisite for ensuring novel program content, data security, and smooth communication. Neglecting technology or failing to keep up with new technology development trends will result in being elimi-

nated by the era. Currently, converged media centers across regions face a shortage of computer technology professionals, with talent pipelines suffering from a generational gap and scarce technical talent that is difficult to recruit and retain. Only by actively adapting to all-media development trends, concentrating efforts on cultivating and gathering outstanding technical talent, and striving to overcome technical bottlenecks in the media convergence process can media organizations achieve sustainable development and safeguard overall competitiveness. Outstanding talent is crucial, especially as technology continues to update and iterate and media convergence advances comprehensively, the demand for high-quality information technology professionals will only increase. Therefore, we must intensify talent cultivation efforts and reserves, build a high-quality and technically proficient team, continuously enhance talent competitiveness, and improve technical support and innovation capabilities. Meanwhile, media must extensively utilize their own and current content resources to attract more audiences, achieve integration and innovation between technology and content, gradually enhance overall strength in the new media field, and thereby create greater economic and social value.

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*Note: Figure translations are in progress. See original paper for figures.*