



# Analysis of the Deviation of Communication Ethics and the Regulatory Paths in the Context of 5G Technology Popularization

Tianyu Dong

Taiyuan University of Technology, Taiyuan City, Shanxi Province, Postcode 030024, China

Email: dongtianyu@tyut.edu.cn

**Abstract.** With the deep penetration of the core characteristics of 5G technology, such as high speed, low latency, and wide connectivity, in various fields of society, the underlying architecture and operational logic of communication and dissemination have undergone a disruptive transformation, and at the same time, it has given rise to complex and diverse ethical deviance propositions. This article, based on typical ethical deviance cases in the application of 5G technology over the past five years, systematically analyzes the concrete manifestations and deep causes of ethical deviance in communication and dissemination in the 5G era. Relying on authoritative academic research and policy texts, it constructs a multi-cooperative regulatory framework of "legal regulation - technical prevention - subject self-discipline - social governance", providing theoretical support and practical models for the construction of the communication and dissemination ethical system in the context of 5G technology popularization.

**Keywords:** 5G technology, communication transmission, ethical misconduct, regulatory approach

## 1 Introduction

5G technology, as the core carrier of the next-generation mobile communication technology, has achieved a significant leap in communication speed and connection scale, promoting the construction of the "Internet of Everything" ecosystem. It demonstrates the value of technological empowerment in areas such as intelligent terminal interaction, industrial internet, remote medical services, and smart cities. According to data from the Ministry of Industry and Information Technology, by the end of 2025, the number of 5G base stations in China has exceeded 4 million, and the number of 5G mobile phone users has reached 889 million, with a penetration rate of over 50%. This indicates that China's 5G has entered a critical stage of large-scale popularization and in-depth application. However, the rapid development of technology is accompanied by lagging ethical regulations. 5G has made communication and dissemination exhibit characteristics of diverse subjects, complex scenarios, and massive data. Issues such as

privacy leakage, information abuse, and digital divide have become prominent, challenging the order of communication and dissemination and social public interests. Therefore, analyzing the manifestations of ethical violations in communication and dissemination under the 5G context and the regulatory paths, is of significant theoretical and practical significance for promoting 5G to "be beneficial to humanity" and building a communication and dissemination ethical system that is compatible with the digital era.

## **2 The Specific Manifestations and Cases of Ethical Violations in Communication and Dissemination in the Context of 5G Technology Popularization**

### **2.1 Privacy Data Leakage and Abuse: "Data Theft" Enabled By Technology**

The extensive connectivity feature of 5G technology enables the complete networking of terminal devices, and users' geographical locations, call records, consumption preferences, and other private data are collected and aggregated on a large scale. Some market entities and related institutions, leveraging their technological advantages, abuse data resources without obtaining sufficient user authorization, constituting a typical violation of communication and dissemination ethics. In 2024, a leading smartphone manufacturer was investigated by the regulatory authorities. The 5G flagship model it launched continuously collected real-time geographical locations, call content transcriptions, and application usage trajectories through built-in sensors in scenarios where users had not granted authorization. After the relevant data was transmitted to the enterprise's cloud server, it was used for precise advertising push and third-party data transactions, involving over 10 million users, triggering a large-scale privacy rights protection incident. Such cases fully highlight the vulnerability of personal privacy protection in the 5G era. The high-dimensional data collection capability of technology has been distorted into a "data plundering" tool, violating the core principles of respecting individual privacy and life rights in technological ethics [4].**Sample Heading (Third Level).** Only two levels of headings should be numbered. Lower level headings remain unnumbered; they are formatted as run-in headings.

### **2.2 Rapid Spread of False Information: Low Latency Feature Amplifies Social Risks**

The low latency and wide coverage features of 5G break through the traditional limitations of information dissemination in time and space, enhancing the efficiency of dissemination while providing a technical platform for the rapid spread of false information. In public emergencies, it is prone to magnify social risks. During a natural disaster in a certain region in 2023, criminals used 5G technology to spread false information such as "drinking water in the disaster area is contaminated" and "strong aftershocks have triggered secondary disasters" on social media. Within two hours, it covered the social circles of five surrounding cities, causing the public to act irrationally

by rushing to purchase supplies and evacuate disorderly, disrupting the post-disaster rescue efforts. Compared to the 4G era, the speed of false information dissemination in the 5G environment has doubled, the scope has expanded geometrically, and the destructive power against social public order has significantly increased.

### **2.3 Cybersecurity Vulnerabilities Emerge: The Internet of Everything Triggers Systemic Risks**

The 5G connected terminals cover areas such as smart home, industrial control, and autonomous driving, constructing a "human-machine-object" fully connected architecture, which significantly expands the network attack surface and the ethical risks caused by security vulnerabilities are prominent. In 2025, a certain industrial park's 5G industrial interconnection system was attacked by foreign hackers. The attackers exploited the security vulnerabilities of the base stations to modify the parameters of the intelligent production equipment, causing three core production lines to stop working, resulting in direct economic losses of over 20 million yuan. At the same time, the core production technology secrets were leaked. Moreover, cases of home automation intrusion and control of surveillance cameras are common. The systematic security risks of the 5G network have extended from technology to the ethical level, directly threatening the personal and property safety of users [5].

### **2.4 Digital Divide and Technological Dependency: The Dual Absence of Fairness Ethics**

During the process of 5G adoption, due to uneven regional development, high terminal costs, and differences in digital literacy, new digital divides have emerged. The ethical controversy of excessive reliance on 5G cannot be ignored either. In terms of urban-rural divide, by the end of 2024, the coverage rate of 5G base stations in rural areas of China was only 65%, much lower than 98% in urban areas. Rural residents have significant disadvantages in accessing public services such as educational sharing and remote medical care enabled by 5G. This violates the ethical principles of fairness and justice [3]. At the individual level, extreme weather in a certain first-tier city led to a large-scale disruption of 5G networks, and some residents, due to their excessive reliance on 5G-supported mobile payment and online government services, were unable to conduct normal transactions or handle government affairs, highlighting the erosion of individual life autonomy by technological dependence and reflecting the deviation of 5G adoption from the "humanistic spirit".

## **3 Analysis of the Causes of Ethical Deviation in Communication and Transmission in the Context of 5G Technology**

The emergence of ethical violations like privacy leaks, false information dissemination, cybersecurity vulnerabilities and digital divide stems from the cumulative impact of

interrelated factors. On one hand, 5G's far faster iteration outpaces the development of ethical regulatory systems. Its core traits—ubiquitous connectivity, massive data processing and distributed architecture—have fundamentally reshaped traditional communication, breaking human-machine-object interaction boundaries and enabling cross-scenario data flow, which renders traditional regulation (dependent on clear subject delineation and fixed scenario constraints) inadaptable. Meanwhile, specialized regulations for 5G-specific ethical risks (e.g., cross-border data transmission and intelligent terminal data collection norms) are still being refined, creating obvious regulatory gaps in emerging fields [5]. On the other hand, driven by extreme commercial interests, some market entities distort tech innovation's value orientation, prioritizing profit over ethics. They exploit tech and data advantages to bypass user authorization, simplify ethical reviews and even treat users' private data as "profit-making tools" via improper means like data trading, neglecting user rights and public interests and lacking "technology for good" awareness [7]. Moreover, the public's awareness of 5G ethical risks is generally inadequate: most lack systematic privacy protection skills and critical discernment of false information, and the national digital literacy education system is incomplete. Severe literacy gaps across age, regional and educational groups (e.g., rural residents and the elderly failing to utilize 5G's cultural and public service resources) widen the digital divide, hinder joint social defense against ethical violations and impair the equitable spread of 5G-empowered new cultural forms such as sports culture communication, further highlighting tech development's ethical dilemmas [2]. These factors interact and reinforce each other, ultimately exacerbating the spread of ethical violations in communication and transmission.

## **4 The Regulatory Approach to Communication and Dissemination Ethics in the Context of 5G Technology Popularization**

### **4.1 Improve the Legal Regulatory System and Strengthen the Institutional Bottom Line**

Accelerate the special legislation on 5G communication ethics, integrating ethical norms into the legal framework. Based on the "Data Security Law" and "Personal Information Protection Law", formulate special regulations such as "Ethical Norms for 5G Technology Application", clearly defining the rights and obligations of all parties, strictly restricting key links such as data collection, storage, transmission, and use, and increasing the severity of penalties for misconduct. Establish an emergency review mechanism for 5G technology application ethics, proactively assessing ethical risks of new technologies and new scenarios, ensuring that technological innovation and ethical norms proceed in coordination [1].

#### **4.2 Strengthen Technical Prevention Measures and Enhance Risk Governance Capabilities**

Based on technological innovation, a 5G ethical risk prevention and control system should be constructed to achieve proactive regulation of "technology for the better". Promote the deep integration of blockchain, artificial intelligence and 5G. Utilize the non-modifiable and traceable characteristics of blockchain to track the entire data process; leverage artificial intelligence to accurately identify false information and harmful content, improving the efficiency of risk handling. Strengthen the research and development of core technologies for 5G network security, improve base station protection facilities, and promote quantum encryption communication to reduce the risk of network attacks. Establish a 5G ethical review and certification system, conduct security certifications for terminal devices and application platforms, and curb the risk of deviant behavior from the source.

#### **4.3 Strengthen the Primary Responsibility and Enhance Industry Self-Discipline**

Clarify the main responsibilities of enterprises and promote the establishment of internal ethical governance mechanisms. Encourage 5G enterprises to establish technology ethics committees, embed ethical review into the entire process of product design, production, and operation, conduct regular self-inspections and evaluations, and publicly disclose the governance situation for supervision. Utilize the role of industry associations, formulate industry ethical self-discipline conventions, establish an enterprise ethical credit evaluation system, link ethical performance with market access and policy support, and guide enterprises to actively fulfill ethical responsibilities [7].

#### **4.4 Establish a Social Governance Framework And Enhance the Ethical Literacy of the Entire Population**

Promote the collaborative efforts of the government, enterprises, the public and the media to establish a social governance model. The government should enhance the publicity and education on technological ethics, incorporate digital literacy and ethical knowledge into national education, and improve the public's risk awareness and prevention capabilities. The media should play a role in public opinion supervision, expose typical cases of misconduct, and create a supervisory pressure. Establish a long-term mechanism for public participation, set up an award system for whistleblowing, and open up supervision channels to create an atmosphere where "everyone participates and everyone supervises". Strengthen international cooperation and participate in the formulation of global 5G ethical rules, draw on advanced experience to enhance the internationalization level of governance [6].

## 5 Conclusion

The widespread adoption of 5G has brought revolutionary changes to communication and has also challenged traditional ethical systems. Issues such as privacy leakage, dissemination of false information, cybersecurity vulnerabilities, and digital divide, which are manifestations of disorder, stem from the imbalance between technology and ethical regulation, the lack of responsibility of market entities, and the insufficient digital literacy of the public. To build a communication and dissemination ethical system suitable for the 5G era, it is necessary to rely on laws to establish the bottom line, leverage technology to strengthen prevention and control, rely on self-discipline to compact responsibility, and rely on co-governance to form synergy, achieving a positive interaction between technology and ethics. Adhering to the "technology for the good" orientation can unleash the positive effects of 5G, promote high-quality development of the industry, and provide support for social progress and the improvement of the country's digital governance capabilities.

## References

1. Zhang Min, Li Haoran. Philosophical Analysis of the Paradox of Personal Information Security in 5G Networks [J]. *Journal of Peking University (Philosophy and Social Sciences Edition)*, 2025, 62(1): 89-98.
2. Wang Yong, Xu Xianghong. Exploration of New Forms of Sports Culture Transmission and Ethical Dilemmas in the 5G Era [J]. *Journal of Beijing Sport University*, 2021, 44(7): 132-142.
3. Author, F., Author, S., Author, T.: Book title. 2nd edn. Publisher, Location (1999)
4. Fang Y, Khan M A. Privacy Challenges in 5G Data Collection and Processing[J]. *IEEE Communications Surveys and Tutorials*, 2024, 26(3): 1890-1915.
5. Chen Xi, Zhao Wei. Research on 5G Security Technology Framework and Key Protection Measures [J]. *Communication Technology*, 2023, 56(8): 1921-1928.
6. Silva J, Costa E. Cybersecurity in the Digital Era: Geopolitical Impacts and Structural Challenges[J]. *IOSR Journal of Humanities and Social Science*, 2025, 30(1): 30-44.
6. Silva J, Costa E. Cybersecurity in the Digital Era: Geopolitical Impacts and Structural Challenges[J]. *IOSR Journal of Humanities and Social Science*, 2025, 30(1): 30-44.
7. Liu Chang, Chen Ming. Research on the Governance Path of 5G Communication Communication Ethics Deviation [J]. *News and Communication Studies*, 2024, 31(5): 76-87.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

