

Research on the Causes of the Social System of Contemporary Technology Risk

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Abstract—From the perspective of the social system, the negative impact of technological risks caused by the misconduct of risk subjects represented by government management agencies, technical experts, the public and the media has rapidly spread beyond technology itself, and the risks of each risk subject Anomie is an important factor in the risk of contemporary technology. In the face of many problems facing contemporary technological risks, research on the causes of the social system of technological risks will help to find a way to avoid technological risks.

Keywords: *technical risk, government system, technical expert system, media system, public*

I. INTRODUCTION

Facing the impact of contemporary technological risks, many scholars at home and abroad have constructed corresponding theories, explored the causes of technological risks, and actively sought ways to avoid technological risks. Specifically, the study of the causes of contemporary technological risk in foreign academic circles is mainly carried out from three perspectives: the objective reality of technological risk, the subjective construction of technological risk, and the organic combination of subjective and objective aspects of technological risk. Scholars who hold a view of contemporary technological risk as an objective reality view advocate a quantitative analysis of the negative impact of technology through positivist methods based on the destructive objective facts brought by technology. Based on objective facts, Rachel Carson reveals the irreversible and continuous damage to the ecological environment caused by the misuse and abuse of technologies such as DDT; H. W. Lewis systematically analyzes toxic chemicals, non-ionizing radiation, ionizing radiation, and nuclear The risks of pollution and other technologies; Evan. W. M based on the specific cases of the Chernobyl incident and the millennium bug disaster, deeply analyzed many technical risks. Scholars who hold contemporary technological risks are subjective constructive views, and emphasize that technological risks are based on people's subjective cognition and are subjectively constructed under the overall framework of science, technology, and social systems. Mary Douglas and Aaro Wildavsky analyzed technology risk from the perspective of risk culture. They believe that the increase in technology risk today is essentially an increase in the risk that people can

"perceive", not an increase in objective risk. Factors such as people's living area and education level have an important influence on the degree of technological risk perception; Ortwin Renn and Bernd Rohrmann comprehensively analyze sociological, psychological, and cultural studies to analyze subjective elements such as risk culture and risk perception. Impact on technology risk generation. Scholars who hold the subjective and objective combination of technological risk are represented by Ulrich Beck and Anthony Giddens. They combine the objective reality and subjective constructive views of technological risk organically. Rush noted that "Baker and Giddens are still institutionalists. They define risk in a risk society supported by the structure of the system." [1] Ulrich Beck also claims to be an "institutionalist". He believes that contemporary technological risks are essentially "civilized risks." He explores the roots of technological risks from the perspectives of "ignorance" and "organized irresponsibility." "Political reconstruction" and "cross-border governance" to circumvent it. Anthony Giddens believes that contemporary technological risks are "manufactured risks", and design errors, operational errors, unintended consequences, and the circularity of knowledge are the causes. The research of Chinese academic circles on technological risk is based on the study of western scholars' risk theory, and it is continuously constructed and improved. From the perspective of modern technology risk causes and evasion perspectives, domestic scholars' research is roughly divided into three dimensions: First, reveal the causes of technology risks from the dimension of technical rationality, and avoid technical risks by means of rational reshaping and strengthening humanistic care. Secondly, from the perspective of STS, the traditional technology concepts and cultural construction are lagging behind. The lack of technical ethics, insufficient technical supervision and prevention are the causes of China's technological risk. And preventive system construction and other means to reduce the social negative effects of technological risks. Thirdly, from the overall dimensions of science, technology and society, it analyzes the uncertainty of science and the complexity of technology as the inherent factors of the generation of modern technological risks. The subjective construction of technological risks by various subjects in society is the external factors of its generation. And to avoid technical risks through the subjective construction of the mechanism.

II. RESEARCH PURPOSES

Generally speaking, the study of contemporary technological risk issues in foreign academic circles shows that there is an objective reality perspective to a subjective constructive perspective. However, the research content is relatively macro, and it tends to construct and improve the theoretical system. Foreign academic circles have rich research on the causes of contemporary technological risks, and have put forward many valuable methods for the avoidance of technological risks. However, from the perspective of the social system, a systematic analysis of the causes of technological risks and the search for ways to avoid them need further research. deepen. In view of the above, exploring the causes and avoidance of technological risks from the perspective of the social system has done at least two levels: First, technology has become an important driving force for the development of contemporary society, and the risks inherent in it will coexist with technological development; it must be weakened or to avoid the technical risks caused by contemporary technology, it is necessary to carry out a systematic analysis and research on the influencing factors that trigger and expand technological

risks from the social system level. Second, from the perspective of the social system, the main factors affecting contemporary technology risks include the government management system, the technical expert system, the public, and the media; clarifying the misbehavior of various risk subjects in the social system has led to the outbreak and proliferation of technological risks, and constructed evasion. The social system mechanism of technology risk is of great significance for weakening and avoiding the negative impact brought by technology.

III. PROBLEM RESEARCH FRAMEWORK AND CONTENT

From the perspective of the social system, the negative impact of technological risk consequences caused by the deregulation of risk subjects represented by government management agencies, technical experts, the public and the media quickly spread beyond the technology itself, and the deregulation of each risk subject constitute An important factor in contemporary technological risk. Therefore, the systematic framework of the causes of the social system of technological risks is shown in “Fig. 1”:

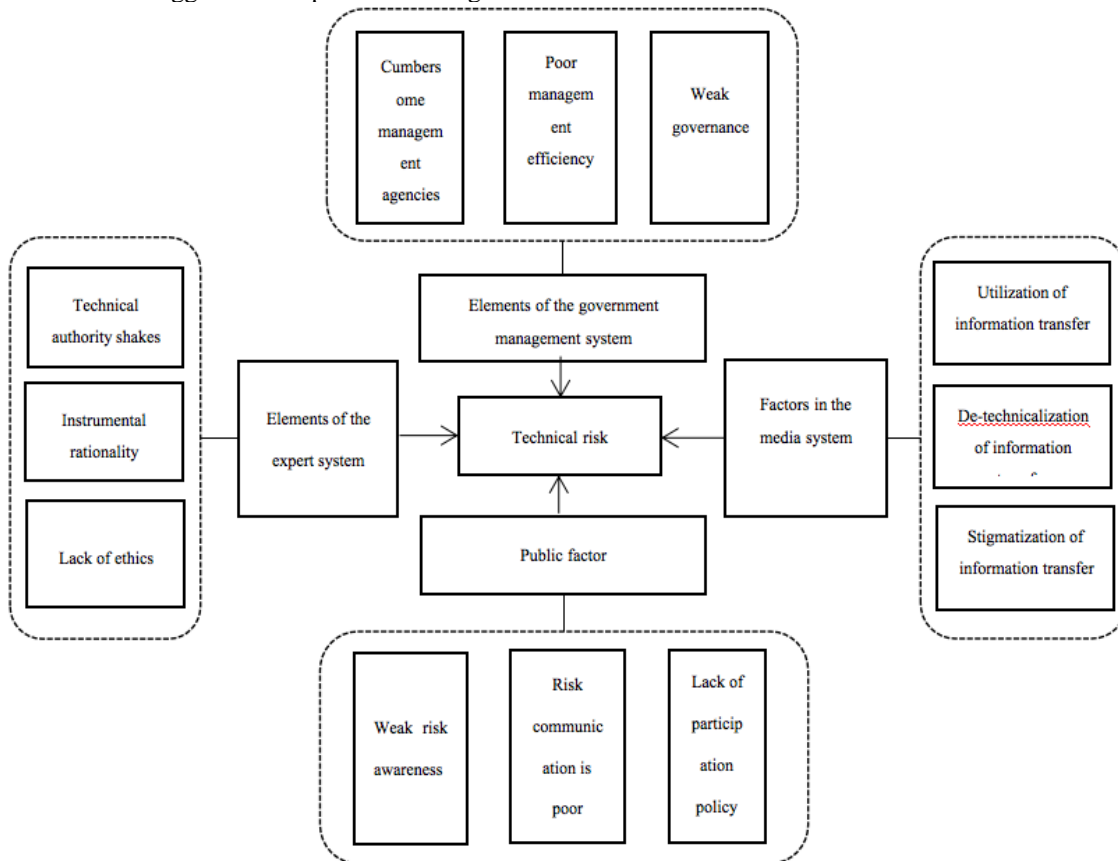


Fig. 1. A systematic framework of the causes of the social system of technological risks.

A. Causes of government management system for technology risk

The factors of the government risk management system of technology risk are mainly reflected in the lag in the

construction of the technology risk system. The construction of technology risk system is an important task in government management. It is related to whether technology risk management is effective and orderly, and it has a holistic and global effect. Due to the complexity of government

management agencies, unclear management rights and responsibilities, low management efficiency, and weak governance effectiveness, the impact of negative technology effects is a key factor in the construction of a technical risk governance system.

The complex setting of relevant government management agencies, the "absence" and "offside" phenomena among the functions of related agencies, leading to unclear rights and responsibilities of the main bodies of the related agencies, and to a certain extent appear "bureaucratic" characteristics. The government plays an important role in ensuring the normal operation of the society. The organization is large and complex, and its operations are subject to various rules and regulations. The flexibility of its actions is relative to the suddenness of technical risks and the uncertainty and unpredictability of consequences. That said, it is slightly insufficient. The main manifestations are: under normal circumstances, although there are more or less functional overlaps and overlaps between different departments of various agencies, and the relevant division of responsibilities is unclear, they can all operate independently and in an orderly manner. Because institutions or departments rarely conduct targeted communication, coordination, and cooperation exercises under normal circumstances, when facing the challenges of technological risks, coordination and cooperation between institutions is not smooth. Position or misplacement, the phenomenon of shirk, shirk, and pass on responsibilities between various agencies or departments will appear. The "justification" of responsibility by relevant agencies or departments is not only detrimental to social stability and orderly operation, but also causes great damage to the government's image and credibility.

The efficiency of relevant government management agencies is slow, and the response to technology risk assessment, communication, and management is slow, resulting in a relatively weak society's ability to respond to technology risks. From the generation to the end of contemporary technology risks, they are roughly divided into four corner phases: "risk incubation period-risk brewing period-risk treatment period-risk calming period". At every stage of risk response, the efficiency of relevant government agencies is being tested. The technical risk latency period mainly refers to the period before the use of contemporary technology; in this period, if the relevant government agencies fail to fully "risk assess" the technology, it will lead to "cognitive" risks and "occurring" risks. There is a gap, which reduces the ability to respond to actual risks. The technical risk brewing period refers to the period when it is foreseen that there may be huge risks in related technologies; in this period, the slow development of the risk early warning mechanism of relevant government agencies directly led to the serious lack of conscious avoidance of risks by the society, which gave it an "irreversible" nature. The risk consequences of this increase bring greater uncertainty. The technical risk treatment period refers to the period from the negative effects of related technologies to the time when the negative effects are effectively controlled and the emerging problems are basically solved. During this

period, the government, through an authoritative platform, was slow, distorted, or even selectively "aphasia" about the occurrence, impact, consequences, and countermeasures of technological risk events, which would allow time for the spread of "rumors" and give risk to Expand free up space. The technical risk subsidy period refers to the period of experience summarization after the problems caused by the risks have been completely resolved; in this period, the experience summary of relevant government agencies has been slow, and the laws and regulations and systems to deal with related technical risks have not been constructed in a timely manner, which may cause similar technical risks. Happen once again.

The governance effectiveness of relevant government agencies is not strong, and excessive intervention or *laissez-faire* on the subject of risk responsibility results in a decline in the ability to jointly cope with technological risks. The main bodies responsible for risk include the relevant government agencies, expert systems, the public, and corporate media who participate in risk assessment, communication, and management. As the main responsible body for maintaining and managing the normal operation of the society, relevant government agencies should guide and help other responsible parties for technical risks and fully communicate with them to become a "community of responsibility" for jointly responding to technical risks. Excessive government intervention, even excessive "centralization" over other responsible parties, will lead to the weakening and loss of the ability of other responsible parties to participate in and respond to technological risk. If this happens, the technical expert system may become a "captive" of political organizations with ulterior motives, the enterprise may become a "captor" of related institutions, the media may become the "big speaker" of the technical "bureaucracy", and the public will become the ultimate technical risk bear By. Relevant government agencies' *laissez-faire* on other responsible parties, or even losing supervision of each responsible party, will cause each responsible party to use whatever means for its own interests, and eventually there will be more harmful consequences than technical risks, and the public will still have consequences the main bearer.

B. The causes of technical risk expert system

The technical expert system refers to "a system composed of technical achievements and professional teams." [2] As an important component category of the "de-domain" mechanism, the technical trust system is the core of its effective operation. [3] The establishment of trust is not completed overnight, so modern society depends on its operation The Yu Expert System was established during the long-term development of society. However, trust is fragile. Although it is not easy to establish trust, it is relatively simple to destroy it. Especially when the expectation of the trust subject cannot be achieved, the trust of the trust subject will decrease, and the "trust" relationship will be destroyed. The shake of the authority of the technical expert system, the expansion of the technical expert system's instrumental rationalism, and the lack of ethics will all make the technical

expert system's trust subjects reduce their trust, thereby causing the society to jointly reduce the "combined force" of technological risks .

The contradiction between the systematic nature of contemporary technological development and the limitations of the recognition of technical experts has led to differences in the recognition of the same issue between technical experts in different fields, disputes between technical experts in the same field, and even the same expert at different stages. The conclusions drawn from the study are contradictory, thus shaking the "absolute" authority of the technical expert system. For technical experts in different research fields, due to the continuous refinement of contemporary technology research fields, each technical expert is only familiar with their research fields. Therefore, in the face of the innovation of contemporary technology, no expert has sufficient ability and courage to ensure that they fully understand and control it. For the technical experts in the same field, there will always be disputes on the same technology and research on the same issue. The higher the certainty of the technology, the more intense the disputes will appear. Such disputes will maintain a dynamic consensus among technical expert systems in the same field who are constantly "groping," "trial and error," and "correcting." [4] As for a single technical expert, as he continues to deepen his research in a certain technology field, he will continuously adjust the research conclusions previously determined by himself, or even draw completely similar to the previous Different results. With the improvement of public education, especially the Internet has provided rich learning resources and learning opportunities, shortened the "unreachable" distance between the public and technical experts, and the "mystery" that is positively related to the authority of technical experts has gradually subsided. The authority of the technical expert system is also reduced.

The expansion of instrumental rationality and the weakening of value rationality have made instrumental rationality dominate the technical expert system, created a "false image" that technology can always surpass nature, shaped a cold society, and reduced people to "one-dimensional people", resulting in humanities Weakness of spirit and value rationality. There is already a tension and conflict between instrumental rationality and value rationality. The former is mainly to solve the "what" problem, and the latter is mainly to solve the problem. "What to do" question. The conflict between the technical expert system and the public is essentially the collision of the "rational" and "humanistic" thinking. The former is concerned with objectivity and facts, while the latter is concerned with values, significance. Therefore, the expansion of instrumental rationality over the control of the technical expert system will greatly ignore the value and significance of the technology that the public cares about, and will increase the public's sense of fear and anxiety about technology. It is mainly manifested in three dimensions: In the natural dimension, the technical expert system will ignore the relationship between technical people and nature in the process of "design-research-development-experiment-application" of technology, and simply treat technology as

The tool that humans use to conquer nature and regard nature as a "vassal" of mankind, this subversive perception is the root cause of the contemporary ecological crisis. On the social dimension, technological alienation has flooded the corners of society, turning the "world of color, rhyme, and floral fragrance" into a "one world" without temperature. [5] In the personal dimension, the relationship between people is alienated and becomes a "one-dimensional person", and each person is designed as a "component" of the operation of the machine system, human dignity as a human being was completely destroyed, and the humanistic spirit was completely suppressed.

The lack of ethics of the technical expert system makes the technical practice break through the "cage" and move to an extremely dangerous situation, further aggravating the public's distrust of the technical expert system. Technology, as an important force for social development, bears social responsibility in itself. On the one hand, the neutral value of technology believes that the essence of technology lies in innovation, and should not be subject to too many social rules and bear too many ethical responsibilities. However, as the subject of technological innovation and practice, technical experts' ethics will directly affect the purpose, application and results of technological creation. From the perspective of knowledge, technology, as the content of knowledge form, has neutral characteristics, but social technology as an element to promote society, its production and application are permeated with ethical issues. Therefore, the technical expert system is the earliest perceiver of the risks inherent in the technology it develops and the application of the technology. It is full of unavoidable social, ethical, and historical responsibilities. In this process, the ethical, moral, and social responsibilities of the technical expert system, the lack of direct results in the expansion of uncertainty caused by technology. On the other hand, the drive of utilitarian values is another reason for the lack of moral ethics of technical expert systems. The concept of utilitarianism mainly refers to the basic principle of technical experts' research, development, creation and use of technology. It is undeniable that the pursuit of "utilitarianism" is the core of technological innovation, but losing the social responsibility of technology and overemphasizing utilitarianism, and taking "utility" as the only value goal pursued, resulting in only focusing on the short-term benefits of technology and weakening or ignoring the huge hidden dangers of technology Behavior, therefore, greatly increasing the probability of causing technical risks and the severity of negative effects caused by technology. The utilitarian value-driven technical expert system only serves itself or an interest group, and has become the "principal expert" and "interest spokesperson" of some interest groups, which has greatly damaged the publicly known image of the technical expert and caused public trust in it.

C. Causes of media risks in technology

As an "intermediary" for effective communication between various subjects, the media system is intervening in the entire process of technological risk processing at an

amazing speed and strength, and has also become an important factor in the generation of technological risk. The media, as the main channel for the public to perceive technological risks, plays an important role in the public's awareness of the risks of technology and technology, which also makes it an important role for the manufacture of technological risks.

Utilization of information transmission in media systems. Utilitarianization means that the media system is affected by various stakeholders, causing confusion in the transmission of information. The media system serves as the "mediator" for technical risk communication and cognition among the responsible parties. Its role is to enhance the public's awareness of technological risks, strengthen the technical risk communication between the government, technical experts and the public, and improve the public's technical risk. At the same time, it will feedback the public's opinions and doubts about the government and technical experts, and increase the public's trust in the government and technical experts through interaction. In fact, media reports on actual technological risks have not fully fulfilled their responsibilities. This is mainly because the media system is affected by the pressure of various stakeholders in the process of acting as a "speaker", which weakens its "independence" and then becomes an "arena" where different stakeholders win their own interests; different interests The main body asked the media to "voice", making the information received by the public about the occurrence and consequences of technological risks inconsistent, causing confusion in the public's perception of technological risks, and aggravating the public's distrust of government systems and technical expert systems. Concerns about the media system. As a result, relevant technical experts will complain that the media "create panic", the government system accuses the media of "irresponsible", and the public criticizes the media for "unfairness" and other conditions, which will cause technical risk events to cause public panic due to "confusing".

De-technicalization of media system information delivery. De-technizaton refers to "during the media's reporting or dissemination of contemporary technological risks, diluting the scientific principles of technological knowledge, rationality, and technological dependence, strengthening the social attributes of technology, leading to controversy surrounding technological risks away from technology itself and shifting to the social level." [6] The characteristic of media systems is that they must "grasp the eye" when transmitting information. Therefore, related technical risk events are not attractive to the media system in terms of expertise related to the technology itself, the risks inherent in it, and the uncertainty associated with technology applications. Therefore, in the process of reporting related technical risk events, the media pay attention to selecting controversial social disputes that seem to determine "facts", while ignoring the relevant knowledge content of the technical event itself. The "de-technicalization" of information transmission in media systems has brought huge negative effects to social development, leading it to irrational

discussions, causing confrontation between the public and experts, decreasing public trust in the government, and affecting social conflicts highlight. Relevant issues such as the media system's enthusiasm and speculation about the safety of genetically modified genes and the feasibility of gene editing have led to the public's strong rejection of genetically modified food and gene editing projects. Anxiety, panic, mistrust, hesitation and other emotions spread throughout society. It can be seen that the "de-technizaton" of information transmission in media systems will not only dissolve the public's trust in technical experts, become a resistance to shake technological innovation, but also become an important influencing factor for technological risks.

Stigmatization of information transfer in media systems. Stigmatization refers to the media's stigma for a certain technology in order to gain social attention in the process of reporting risks or technological risk events contained in technology, which has caused the public to strongly oppose the relevant technology or technology product. The "stigma" of technology roughly includes the stage of magnifying technology risks, the stage of "stigma" of technology being crowned, and the stage of public reaction to "stigma" of technology. [7] With the network, the continuous advancement of informatization and intelligence has greatly promoted the rise of emerging media, which in order to track the hot spots of the news and grab the attention of the society, constantly creating technical unknown events. Some media have chosen false "facts" and created "fake news" to cater to the public's psychology with seditious, irritating and extreme news headlines and media stigma. Causes technological stigma to accelerate, deepen, and shorten time. The stigmatization of technology by the news media will greatly exceed the negative impact of technology itself on social development.

D. Public causes of technological risks

The public, as an indirect or direct bearer of technology risks, has limited awareness of the consequences of technology design, technology itself, technology application, and technology operation, which results in technology risk consequences far exceeding the technology itself. The public, as an indirect or direct bearer and judge of the consequences of a technology risk event, has a relatively strong willingness to participate in the technology risk communication process. Failure to resolve the issue directly affects the public's trust in the government, the technical expert system, and the media system, and further results in the further expansion of the results of technological risk events.

Weak awareness of technological risks refers to the public's lack of awareness and weak awareness of the consequences of technology itself, applications, and technology risk events, resulting in panic about technology or technology risk events. On the one hand, the lack of public awareness of related technologies has led to a lack of rational analysis and reflection on technological risk events. The public's professional knowledge of related technologies, the risks of technology, the advantages and disadvantages of

using technology, and how to prevent technological risks cannot be rationally understood and analyzed. The consequences of technological risk events will far exceed the scope of public experience. As a result, the public cannot effectively deal with the consequences of technological risk events, which will further expand the scope and extent of the consequences of technological events. On the other hand, changes in public psychology have contributed to the generation and expansion of technological risks. The public is seriously disturbed and anxious about the development of contemporary technology. In fact, people's fear of risks caused by familiar technology fields is far less severe than that of unfamiliar fields. Therefore, the uncertainty of technology in unfamiliar fields causes public psychological imbalance, which expands the public's negative impact on its risk consequences. From a social perspective, the above two factors cause the public to lose the correct judgement on the consequences of technological risk events, and there will be irrational seriousness such as "salting salt", "water grabbing", "grabbing blue roots" and "robbing double Huanglian" incidents that disrupt social order have caused the public to escalate the impact of technological risk events.

Poor communication channels for technical risks. Technical risk communication mainly refers to the communication and communication between the government and the public, and between technical experts and the public on the risks involved in technological development. As a management system of social operation, the government is affected by many factors. In the process of promoting technological development, it will hide the risks inherent in technology, conceal the process of technology risk event handling, and reduce public attention. However, in the process, once the information about related technical risks is leaked, the public has a huge rebound effect on it. The government's subjective view is that technical risks that the public can accept and are willing to accept do not require risk communication with the public. In essence, government measures ignore complex structures such as the public's personal cognition of technological risk, block the opportunity for the public to communicate risk with the government, and cause the public to lose their right to participate in technological risk governance, which in turn has aggravated the public's Distrust. Technologists, as promoters of technological innovation, have their own obvious professional advantages. In their technical design and application process, they often think that the public's knowledge of the technical field is a "layman". If they communicate with the public in the technical field, "Ignorance" or even "foolishness". Therefore, the "arrogance" and "dominance" of technical experts have caused the public and their communication channels to be blocked. As a result, public participation in the processing of technical or technical risk events can only be achieved through the media system, but the utilitarian, de-technical, and heavily stigmatized nature of the media system has caused the public to doubt the media system and ultimately lead to Comprehensive blockage of channels for public participation in technological development or the processing of technological events. In fact, the public pays attention to

the many risks and consequences in the development of technology, and pays more attention to the openness and transparency of the uncertainty that may arise in the process of technology application and technology, so as to safeguard its right to participate and to know.

Lack of public participation policies on technology risks. The public, as one of the important factors of technological risk, should participate in the risk governance process. However, the current public participation in technical risk governance faces greater difficulties. First, public awareness is low, which leads to poor efficiency and poor participation in technology risk governance; second, the policies and mechanisms for public participation in technology risk governance are not perfect; and finally, the legal system that guarantees public participation in technology risk governance is not perfect. Based on the above three issues, a system for effective public participation in technology risk is required to achieve at least several aspects: At the level of participation, the public itself should continue to strengthen the study of technology risk knowledge, increase the level of awareness of technology risks, and strengthen the public. The "fitness" of effective communication with government systems, technical expert systems, and news media; at the government level, the government should focus on enhancing the awareness of respect for public opinion, strengthening the openness and transparency of information, and continuously strengthening public citizenship, from the institutional level Establish an effective mechanism and legal mechanism for public participation in technology risk; at the media level, strengthen the study and reporting of technical risk-related professional content, pay attention to the integrity and systematic reporting of technology development and technology risk processing, and focus on the positive guidance of society reduces the "stigma" of technology and strengthens the public's trust in the media.

IV. CONCLUSION

In short, the increasingly innovative and rapid development of technology is a typical feature of contemporary social development. Gene, nano, nuclear, network and other contemporary technologies have not only brought benefits to human development in contemporary society, but also "brought risks-especially those unknown risks";[8]Contemporary technology has become a major factor in a risk society, and it also reflects an important characterization of the risk society. For example, does the editing and modification of human embryos undermine human ethics? Does cloning destroy traditional human relations? How to effectively manage online crime? Will there be a "nuclear winter"? Can artificial intelligence be completely controlled by humans? The many uncertainties brought by contemporary technology are unavoidable and urgent questions to be answered in this era. Faced with these problems, it is more meaningful to analyze the causes of technological risks from the perspective of social systems, and to study the governance and avoidance policies of technological risks.

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