

Protection Mechanism of Network Rights and Interests of Minors in Cloud Era

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ABSTRACT

In the era of cloud computing, network rights infringement is becoming increasingly serious. This is particularly true for minors, who are a sensitive group and face growing threats. Whereas this, existing protective measures exhibit deficiencies, our project is committed to creating "Health Protection-Minor Edition" APP, which aims to provide customized network security protection for minors. We collected practical data through extensive questionnaires, random interviews, and in-depth interviews using multiple channels. We deeply analyzed key issues, including online fraud, addiction, and exposure to harmful information. Based on this analysis, we designed a series of innovative and systematic protection measures.. At the same time, our project aims to build a bridge between parents and children. We strive to create a more secure and educational network space. This space will provide comprehensive care for the physical and mental health of minors.

KEYWORDS: rights on the Internet, illegal infringement, minors, "Health Protection" APP

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I. INTRODUCTION

A. research background

The scale of underage Internet users in our country continues to expand. According to the "Youth Blue Book: Report on Internet Use by Chinese Minors (2022)", the penetration rate of Internet use among minors is as high as 99.9%, which is significantly higher than the national Internet penetration rate [1] of 73%. It can be seen that by 2022, minors had become the main force in cyberspace, but with the continuous promotion and popularization of intelligent social media applications in the cloud era, the risk of minors being infringed by illegal information on the Internet is increasing day by day, and problems such as "cyberbullying" and "personal privacy leakage" are gradually evolving into global social problems.

The reason is that minors have insufficient awareness of the risks of the online world, weak awareness of self-protection, and personal information and privacy are more likely to be leaked and infringed. They often disclose their identities, interests and other information due to network needs. The platform will be based on big data analysis and targeted push advertisements. What's more serious is that some

minors' information enters the underground market for illegal trading. At this time, the leakage and illegal use of digital identities become a precursor to risk of offline infringement, which poses a great threat to the information security of minors. [2] In addition, the Internet also makes unhealthy or dangerous behavior content, and even some content containing racism, discrimination or hate speech, more easily exposed to minors, which has a double negative impact on their physical and mental health and personal safety.

Based on this, it is crucial to find effective ways to strengthen network-level protection for minors.

B. research purpose

In view of the frequent infringement of minors' network rights and interests in the cloud era, the project team has carried out a series of practical research, and based on the exact data analysis, is committed to exploring an efficient solution mechanism-"Health Protection" APP design research, aiming to protect the network rights and interests of minors in an all-round way.

1. From the micro level, we conduct in-depth studies and analyses to assess the feasibility of the "Health Protection" APP design, build for minors against network rights to resolve the mechanism APP blueprint.

2. From a macro and long-term perspective, the final purpose of this project is to use the "Health Protection" APP to protect minors on the Internet from illegal infringement, and then create a clearer and safer network environment.

C. research significance

In the face of the immature physical and mental development of young people, the unformed values, the weak awareness of safe use of the Internet, and the illegal infringement on the Internet makes minors suffer physical and mental injuries and property losses. The significance of this study is mainly manifested in two aspects:

1. With the help of the "Health Protection" APP, we should better protect the rights and interests of minors, establish a more stringent network security protection system for minors, and form an effective mechanism for protecting the network rights and interests of minors in the cloud era. to prevent online bad information and activities targeting minors, a special group.

2. Highlight the strengthening of society all walks of life in building a healthy, good network environment, to protect minors this heavy large network group aspect indispensable responsibility.

II. The Influence and Consequences of Internet Rights Infringement on Minors

According to the 54th Statistical Report on the Development of China's Internet released by the China Internet Network Information Center (CNNIC), as of June 2024, the number of Internet users in my country was close to 1.1 billion (1.09967 billion people), and the Internet penetration rate reached 78.0. Young people have become the main new force accounting for 49.0 percent^[3]. Back two years ago, Internet use among minors was nearly saturated at 99.9 percent. these phenomena show that minors, as one of the main groups of Internet users, often lack sufficient discrimination and self-protection ability because their minds are not yet fully mature. While enjoying the convenience brought by the network in the cloud era, they also face more potential threats than adults and have become a high-risk group for network rights infringement.

A. The adverse effects of network rights infringement

The infringement of network rights and interests will have many serious adverse effects on minors. First of

all, minors' long-term use of the Internet for browsing and casual games can lead to addiction, over-reliance on the network, and difficulty in extricating themselves. According to the results of the project questionnaire, the number of minors who have been addicted to the Internet for a long time is the most, accounting for up to 26.79 percent. This excessive use of electronic products will not only cause minor vision loss, lack of sleep, and even psychological problems, affecting physical health. It is undeniable that this will have an incalculable negative impact on the normal life and study of minors. In addition, according to the survey results of the "Mental Health Blue Book (2022 Edition)", 14.8 percent of the teenagers participating in the survey have varying degrees of depression risk, and the causes of these problems are mostly caused by ^[7]caused by mobile phone addiction. Secondly, when minors suffer from online fraud, cyber bullying, and browsing bad information, they do not have the ability to distinguish, resulting in property losses and serious consequences of personal information leakage. If these risks faced by minors cannot be resolved in time, they will further evolve into mental illnesses such as anxiety and depression. This psychological condition may accompany them throughout their growth process and profoundly impact their lives. Finally, minors are in an important stage of the formation of values and the development of the brain, usually have a strong ability to imitate and learn. Bandura, in his theory of social learning of aggression, has proposed that people will also learn aggressive behavior ^[8]when accepting and observing aggressive behavior. It can be seen that minors who have been infringed on their rights and interests on the Internet for a long time are very likely to be exposed to violence, pornography and other improper content at the same time, and imitate these bad behaviors. In the long run, this will lead to deviation of values, and even more may embark on the road of illegal crimes.

B. Negative Consequences of Infringement of Internet Rights and Interests

In view of the serious adverse effects caused by the infringement of network rights and interests, such violations will cause varying degrees of negative consequences to individuals and society in the long run. On the one hand, long-term infringement of network rights and interests will change people's thinking and behavior patterns, and reduce the public's trust in the network. According to a survey conducted by the China Youth Daily, of the 2397 valid questionnaires from 107 universities, 20.82 percent of the respondents believed that they would be largely affected by cyber violence, and 56.70

percent of the respondents believed that this would affect their judgment of the incident^[9]. The infringement of network rights and interests not only has an impact on personal mental health, but also may weaken the social trust in the network environment and change people's behavior and judgment. On the other hand, the infringement of network rights and interests is born with the Internet. Compared with the traditional illegal behavior, the network infringement breaks through the limitation of physical space. This characteristic undoubtedly aggravates the complexity and challenge of cracking down on illegal acts against individuals or groups with the network as the medium. There is no doubt that this will hinder the spread of real and useful information, disrupt social order, undermine the harmony and stability of cyberspace and even the real society, and even waste a large number of public resources, including judicial resources. Therefore, we must recognize the seriousness of the infringement of network rights and interests, and take active and effective measures to protect the security and order of the network environment.

III. Review on the current situation of the settlement mechanism of network rights infringement of minors

A. Overview of existing resolution mechanisms

In the context of the cloud era, in view of the particularity of the physical and mental development of minors, as well as the increasingly severe and accompanying far-reaching negative effects of the infringement of network rights and interests, the protection of minors' network security has become a focus of general concern and urgent need to be resolved by the whole society.

At the legal level, China has constructed a series of related protection systems. Represented by the the People's Republic of China Law on the Protection of Minors and the People's Republic of China Cyber Security Law, these laws use the state's coercive force to ensure the network security of minors and prevent young people from having their online rights and interests infringed upon.

At the social level, our country has also taken a variety of effective measures. Many online platforms actively respond to the policy and have launched the "youth model". These models can restrict and filter inappropriate content and help protect minors from bad information on the Internet. In addition, it launched a series of applications that allow guardians and minors to be bound to help parents monitor and manage their children's use of smartphones. For example, parents can learn about minors' mobile phone usage time, homework completion and remote

installation of applications through the parent management APP, in order to better protect minors.

At the same time, China has strengthened supervision and school education to enhance minors' network security and legal awareness. The implementation of these measures will not only help protect the legitimate rights and interests of minors, but also help cultivate their self-discipline and self-protection capabilities.

1. Advantage effects of existing resolution mechanisms

To some extent, the existing settlement mechanism reduces the extent to which minors suffer from infringement of online rights and interests. First of all, the state through the formulation of clear laws and regulations to regulate network behavior, to give minors strong legal protection, and secondly, the school through the system of network security education, to help minors to improve the identification and resistance to network infringement ability. In addition, most of the existing network platforms have set up a "youth model", which has multiple functions such as time management, content screening, and functional restrictions to create a safe and healthy network environment for minors. These comprehensive settlement mechanisms provide all-round protection for minors and ensure that they can grow up healthily and explore freely in the online world.

2. Disadvantage effects of existing resolution mechanisms

In the complex network environment, the existing solution mechanism still has some drawbacks in practical application. First of all, although legislative protection has played a certain role with the help of national coercive force, its lag is difficult to adapt to the rapid evolution of network technology and criminal means, and cannot achieve comprehensive protection of network security. Secondly, the level of school network security education is uneven, and the popularity is also limited, which weakens the effectiveness of effectively preventing network rights infringement by improving minors' network literacy and security awareness. Furthermore, the current non-mandatory and "one size fits all" implementation of the "youth model" has led to monotonous content and serious younger age, imperfect functions, and greatly reduced practicality, which in turn affects the willingness^[10] of parents and minors to use. Finally, although the parental monitoring APP on the market has real-time supervision function, it has strong commercial color and is difficult to uninstall, which may infringe on the personal privacy of teenagers and

is not conducive to their independent growth and mental health and safety.

B. Causes of Disadvantages of Existing Resolution Mechanisms

1. The regulatory system is not perfect

At this stage, the regulatory system for the infringement of the rights and interests of minors on the Internet is still inadequate. In the "time" dimension of supervision, the current regulatory measures mainly focus on the punishment and education after the occurrence of illegal infringement, but ignore the importance of prevention in advance, intervention and suppression in the event, and it is urgent to build a set of dynamic regulatory mechanism. in order to achieve the supervision coverage of the whole chain.

In addition, in the degree of "space" of supervision, the supervision of online platforms in the protection of minors also needs to be strengthened. We should ensure that the network platform not only stays in the superficial form, but really implements practical and effective protection measures to eliminate any perfunctory behavior.

2. Insufficient technical means

In the process of preventing the infringement of network rights and interests, the existing technical means need to be innovated according to the actual needs. On the one hand, the common "youth model" of online platforms often focuses on the perspective of "guardianship" in terms of technical means, restricting the online activities of minors, rather than from the perspective of "minors" to gain in-depth insight into their real needs. Therefore, we should fully mobilize their initiative, timely capture their feedback, demand-oriented, and constantly optimize the model. On the other hand, the special public welfare APP for the infringement of minors' online rights and interests is still blank, which is undoubtedly a major shortcoming in the current prevention system. It is worth noting that the market of parental care APP, in the functional design often has the hidden danger of infringing minors' privacy, in the questionnaire in the early stage of the project, minors also generally believe that these APP can not find a balance in protecting minors' network security and respecting their personal privacy. In addition, the existing APP is also difficult to achieve the effect of accurately identifying and shielding bad information, and there is no function of identifying sensitive words and feeding them back to the guardian.

3. Inadequate social education

In February 2023, the media briefing held by the Ministry of Education introduced the progress of promoting the digitalization of education in the past

years and pointed out that the Internet access rate of primary and secondary schools (including teaching points) across the country reached 100 percent^[11]. China's promotion of the Internet into the campus can not achieve high-quality use of the Internet, but also the lack of social and school education for minors against the network rights and interests. It is mainly manifested in two aspects. First, the form of network security education is single and not personalized. According to the results of the previous questionnaire, the traditional network security education often adopts lectures or brochures, which is lack of interaction and interest, which is difficult to arouse the interest of minors and greatly reduces the effect of education. Second, network security education often stays at the theoretical level, and minors lack practical opportunities. This not only makes minors lack of attention to network security, but also makes them lack the ability to respond to real network threats.

IV. Minors' network rights infringement resolution mechanism optimization mechanism

After practical research, we found that, although the society is paying more and more attention to the network security of minors, the popularity of existing applications and user satisfaction are not satisfactory. In particular, most minors are awakening their awareness of personal privacy protection, and they have reservations about functions that may infringe privacy. This further emphasizes that when we protect the legitimate rights and interests of minors, we must attach great importance to privacy protection to ensure that while ensuring safety, we also respect the personal space of minors.

Therefore, we have launched an optimized solution mechanism-"Health Protection" APP design research, as a public welfare application, to fundamentally solve the problem of arbitrary charges. At the same time, the APP will integrate several innovative functions, including but not limited to anti-addiction system, sensitive vocabulary supervision system, legal science popularization system, guardian binding system, etc., to create a safe and free cyberspace for minors.

A. Design Basis of "Health Protection" APP

1. Legal basis

Minors optimization of network rights infringement the resolution mechanism should strictly follow the "Regulations on the Protection of Minors on the Internet" (hereinafter referred to as the "Regulations"), the "Prevention of Juvenile Delinquency Law", the "the People's Republic of China Cyber Security Law" and other protection of minors' online rights and interests in it is carried out

under the framework of the legal norm system to ensure that there are laws to follow and that laws must be followed. At the same time, the project actively implements the principle of "respect and participation", while effectively protecting minors, fully respecting and protecting their rights and freedom to use the Internet. Avoid "one size fits all" protection measures, excessively interfere with minors' online participation, encourage them to actively integrate into online life, and gradually cultivate their sense of online responsibility and citizenship through practical operations. Of course, in the process of protecting the legitimate rights and interests of minors from infringement, it is necessary to seek an appropriate balance, neither to restrict their online contact due to excessive protection, nor to indulge in excessive use, to ensure that the protection of rights and interests and respect for the reasonable use of the Internet Find the right balance. Compared with the parental guardianship APP on the market, which has the risk of infringing on the privacy of minors, the APP designed by this project adheres to the principle of "most beneficial to minors" in the regulations, and sets up multiple protection systems to comprehensively protect the network development of minors on the basis of protecting the network security of minors.

In addition, in order to deal with the evolving new network rights infringement problem, "Health Protection" APP plays an active role in the actual application, timely collection and feedback of these emerging challenges, so as to promote the relevant laws and regulations to keep pace with the times and ensure that they adapt to the needs of the development of the times.

2. Technical Support

At present, the national network technology has entered a highly mature stage. It can accurately identify and significantly mark suspected fraudulent phone calls and short messages, update a huge fraud database synchronously in real time, and even effectively block fraudulent calls without users' perception. This series of measures have been properly demonstrated in the National Anti-Fraud Center APP, and rich practical experience has been accumulated simultaneously. Based on this, the optimization mechanism APP designed by this project takes the National Anti-Fraud Center APP as the prototype. On the basis of retaining its original powerful functions, it focuses more on the special needs of minors. Through technical optimization and function expansion, it realizes more refined protection strategies, strengthens the pre-examination and dynamic monitoring mechanism of network

information, and realizes the dual guarantee of "pre-protection and immediate intervention, effectively shield the intrusion of bad information and ensure that minors are exposed to a healthy, positive and beneficial network environment. The design not only shows high feasibility in terms of technical realization, but also makes a positive contribution to the construction of a healthy network ecology for minors.

B. Functional Design of Health Protection APP

1. identification and detection

The design of user identification function can protect the legitimate rights and interests of minors, and carry out specific personalized detection for underage users. This APP needs to carry out real-name authentication on the identity of minors when logging in, and at least synchronously bind with the guardian. After successful identification of minors, the anti-addiction system, game time and recharge supervision system will be automatically turned on.

Specifically, the anti-addiction system refers to the implementation of a refined hierarchical screening strategy for online content to ensure that the information exposed to each minor matches their age and mental development level, and sets up a scientific browsing duration management function. When a minor continuously browses and uses mobile phone content for more than half an hour, the system will automatically trigger a rest warning. If the single browsing time accumulates to two hours, the system will automatically send SMS warnings to guardians to inform children of possible risks of Internet addiction, and jointly pay attention to and guide minors to plan their online time reasonably.

At the same time, the game time and recharge supervision system will strictly abide by the "notice on preventing minors from indulging in online games" (hereinafter referred to as the "notice "). The system can accurately identify the game software installed in the mobile phone. If the user tries to open these game-related applications during the non-preset game time period, the system will automatically trigger the forced offline mechanism to prevent users from over-indulging in the game during the non-game period. In addition, once the amount of recharge of minors in the game exceeds the amount limit stipulated in the notice, the system will automatically prevent further recharge operations to ensure that the consumption behavior of minors is reasonably controlled, and immediately notify the guardian in the form of SMS to inform the recharge situation in detail, so that the guardian can timely understand and take corresponding education and guidance measures

to reduce the occurrence of large recharge cases as much as possible.

2. information monitoring and filtering

Fraud warning, APP self-examination, risk inquiry, fraud exposure, I want to report, audio recording, report assistant and other functions are the existing functions of the international anti-fraud center APP. this project will be fully optimized and upgraded on the basis of the existing functions of the anti-fraud center APP, focusing on underage user groups to enhance the accuracy of information monitoring, ensuring that they can stay away from network fraud and illegal infringement, and timely discover and effectively deal with potential risks, to create a safer and healthier network environment for minors.

In order to accurately capture and immediately respond to illegal violations, we specially designed a personalized early warning system, which can customize a personalized safety monitoring program according to the user's age, interests and daily activity habits. For example, for minors who are keen on games, the system will strengthen the screening of in-game transactions and interactive information to ensure that potential fraud and illegal acts are detected and prevented at the first time, and provide tailor-made network security barriers for minors.

3. Safety Education and Publicity

In view of the increasingly serious situation of cyber bullying and violence, we have designed a sensitive word recognition system, which not only automatically filters out all words that may have a negative impact on the physical and mental health of minors, but also has a highly sensitive content monitoring mechanism. When the system detects that minors are searching for sensitive words such as "depression", "despair" or "self-harm", it will automatically strengthen supervision and push the psychological assistance hotline to share mental health knowledge and self-counseling skills to provide psychological support. Help them build a positive attitude and stay away from psychological difficulties.

In order to cultivate the needs of minors in the cloud era of comprehensive literacy, enhance the ability to deal with network bad behavior identification and resistance, we have specially designed a legal science popularization system. The content of popular science focuses on hot issues and closely conforms the guiding ideology of Article 21 of the regulations, so as to ensure the accuracy and educational value of the information. At the same time, in order to stimulate the interest of minors in learning, we adopt a variety of presentation methods, such as vivid and interesting video explanations, colorful animated stories,

fascinating comic series, etc., to make legal knowledge interesting. In addition, we have designed challenging interactive quiz games and role-playing activities so that minors can have fun while growing into wiser and safer online citizens.

4. Parental Guardianship and Control

The guardian binding system is designed to enhance parental supervision of minors' online activities and ensure the timely fulfillment of guardianship responsibilities. The system is closely connected with the sensitive vocabulary system. Once the system detects that minors frequently touch keywords such as sensitive or bad information, it will immediately trigger an early warning mechanism, quickly notify the guardian through text messages, remind them to pay attention to the child's psychological state, and attach Professional mental health guidance resources help parents scientifically guide their children out of psychological difficulties. In addition, when minors' Internet use exceeds the reasonable range and triggers the anti-addiction system, game time, and recharge supervision system, they will also send messages to the guardian so that they can quickly intervene, adjust children's Internet usage habits in time, and jointly promote minors Healthy growth, build a harmonious and safe family network environment.

C. Functional Design Reasons for Health Protection APP

1. Double regulation to prevent Internet addiction

Currently, although many applications are equipped with anti-addiction functions for minors, many minors often use the information of parents or other adults during the authentication process to avoid these restrictions, which undoubtedly increases the difficulty of protecting minors. In view of these problems, the APP designed by our project requires parents to accompany them when logging in, and carries out real name authentication, which effectively solves the problem of minor identification. In addition, our anti-addiction system and game time and recharge supervision system can automatically detect and prevent improper behavior, and send early warning to parents through SMS, so as to prevent minors from indulging in games and large-sum recharge events in a double guarantee way. This not only makes up for the lack of protection measures for minors in some software on the market, but also provides comprehensive protection for the network security of minors.

2. Pre-supervision, Avoiding unlawful infringement

From the perspective of network security, the current network fraud methods are constantly renovated,

making it difficult for minors with weak identification ability to prevent. A large number of minors are weak in identifying risks and self-protection, and are easily involved in the of cyber crime^[12]. In terms of defense strategies, ex post remedial measures are commonly used, that is, to intervene after minors have been infringed on the Internet. This method is not only detrimental to the physical and mental health of minors, but also brings additional pressure to the judicial and other relevant departments.

Therefore, the APP designed by our project adopts a more active pre-monitoring strategy and dynamic adjustment mechanism. It provides personalized early warning and scam exposure by analyzing users' usage habits. This kind of forward-looking protection measures can effectively prevent network risks and ensure that the legitimate rights and interests of minors are effectively protected.

3. Legal Science Popularization, Cultivating Safety Awareness

Compared with the illegal acts in the real world, the infringement of network rights is often more hidden and directly touches the inner world of minors, causing far-reaching and lasting harm to their hearts and spirits. As Mr. Zhang Zhenfeng of Renmin University of China stressed, cyber violence information may not only lead to ideological confusion and psychological abnormalities of minors, but also cause damage to their physical health^[13]. At the same time, the impact of cyber violence information on minors is far-reaching and lasting. American scholar George Gerbner believes that the violent content of the media has a "inducing effect" on children's crime in late childhood, but it is not necessarily related. This effect is a long-term, subtle process^[14]. Therefore, it is particularly critical to design a sensitive vocabulary system to detect and identify changes in the mental state of minors in time, and to provide them with timely psychological counseling and support.

In addition, the cultivation of minors' legal awareness through legal science education is also essential for the prevention of network rights infringement. However, our practice survey found that half of the minors think that the existing legal publicity content is boring and lack of diversity, which makes it difficult to stimulate their interest in learning. In order to solve these problems, the APP legal science popularization system designed by our project team aims to present legal knowledge in a more vivid and interesting way, so as to ensure that minors can improve their network digital literacy in a relaxed and happy atmosphere, so as to better protect themselves and enjoy a healthy network life.

4. Parental guardianship, to achieve precise protection

After a questionnaire survey, we found that nearly 60% of parents are more worried about the risks and challenges that minors will face on the Internet. In view of the fact that parents are the primary guides on the road of children's growth, they not only have natural emotional ties, but also have the unique advantages of immediate adjustment and effective intervention on the behavior of minors. Parents' norms and values will affect their children's behavior, and children will absorb and further imitate their parents' behavior standards, the so-called "internal sexual identity"^[15] in their hearts. In view of this characteristic, the APP function of this project design strengthens the parental monitoring and control function, and gives parents more powerful tools to manage and supervise their children's network activities. Through these functions, parents can more accurately assume the responsibility of protecting and guiding the healthy growth of minors, and ensure their safety and health in cyberspace.

V. Conclusion of Health Protection APP Project

At present, China is committed to continuously strengthening and improving the framework system of network security protection for minors. Although China has adopted diversified measures, the actual effect is still insufficient and has not yet fully met social expectations. In view of this, this project aims to analyze the shortcomings of the existing protection mechanism in depth, and put forward a series of innovative optimization strategies.

In the process of project preparation and implementation, the team used a variety of research methods such as literature review, questionnaire survey and face-to-face interview to ensure the comprehensiveness and depth of the research. After careful research and analysis, we finally conceived and designed the "Health Protection" APP-the intelligent application tailored for minors' network security. This design starts from the 3 core dimensions, that is, minor users, guardians and the application of their own functions, to build a comprehensive, multi-level protection network. It can not only effectively resist the infringement of network rights, but also find an appropriate balance between protecting the network security of minors and respecting their personal privacy. It is an intelligent monitoring tool that truly meets the actual needs of parents and minors, ensures network security, promotes parent-child communication, and helps minors grow up healthily.

In the future, with the continuous progress and iteration of technology, the 'Health Protection' APP designed based on this project will have more opportunities for close collaboration with institutions and platforms, and the prevention strategies and coping methods of minors' network security will also continue to innovate and improve, and respond to the challenges brought by the ever-changing network environment and illegal infringement with a more flexible and efficient attitude contributing China's Program to the Global Minor Cyber Security Governance System.

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