

# Research on College Network Information Security Protection in the Digital Economy Era

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**Abstract:** In the era of the digital economy, the informatization degree of various industries is getting deeper and deeper, and network information security has also come into people's eyes. Colleges and universities are in the position of training applied talents, because of the needs of teaching and education, as well as the requirements of teaching reform, the information construction of colleges and universities has been gradually improved, but the problem of network information security is also worth causing people to ponder. The low security of the network environment will cause college network information security leaks, and even hackers will attack the official website of the university and leak the personal information of teachers and students. To solve such problems, this paper studies the protection of college network information security against the background of the digital economy era. This paper first analyzes the significance of network information security protection, then points out the current and moral problems, and finally puts forward specific countermeasures, hoping to create a safe learning environment for teachers and students for reference.

**Keywords:** Digital economy; Universities and colleges; Network information security; Protection status; Countermeasures

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## 1. Introduction

The upgrading of Internet technology has promoted the development of the digital economy. The 20th National Congress of the Communist Party of China pointed out that the future development of the digital economy still has great potential. The development of the digital economy requires relevant personnel to pay attention to digital ecology and governance, and more importantly, to attach equal importance to development and security. Although the digital economy has brought opportunities to all walks of life and diversified the teaching methods of colleges and universities, the ensuing problems of network information security cannot be ignored. Colleges and universities are places where talents gather, and they are the future successors of the country. Protecting the information security of such people is of great significance for building a harmonious campus and maintaining campus stability. This article has an insight into the advantages of the digital economy, and discusses the network information security of colleges and universities in this era, hoping to reduce information leakage incidents, maintain the information security of teachers and students in colleges and universities, improve the

level of information security protection, and build a truly stable and safe harmonious campus.

## **2. The significance of college network information security protection in the era of digital economy**

From the micro level, the network information security protection of colleges and universities in the digital economy era can protect the personal information of teachers and students; From the macro level, it can maintain the stability of the campus and society. Specifically, its significance is reflected in the following points.

### **2.1. It helps to protect the privacy of teachers and students**

Personal information is private and an important personal resource. In the era of the digital economy, college information covers student status information, family background information, personal contact information, etc. If the information is leaked, it may be abused by people with bad intentions, resulting in inestimable consequences. Therefore, colleges and universities need to take a variety of measures to ensure the security of students' personal information, which is extremely important for the personal privacy of teachers and students <sup>[1]</sup>.

### **2.2. It helps maintain the normal operation of the university**

With the help of digital technology, the university network system includes tasks such as educational administration, scientific research cooperation, and academic exchange. If the network system is considered an attack, teaching order will be disrupted and scientific research data may be lost. This will not only affect the reputation of the school but also hinder the long-term development of the school <sup>[2]</sup>. Therefore, based on the era of the digital economy, research on the network information security protection of colleges and universities can help the school maintain its normal operation.

### **2.3. It is conducive to maintaining national security and stability**

If the university network system is hacked, then the teachers' scientific research results will face the risk of being leaked, and some of the information may even be related to state secrets, which will aggravate the harm, not only affecting the stability of the school but also posing a threat to national security. From this perspective, the role of college network information security protection in national security and stability can not be ignored <sup>[3]</sup>.

## **3. The current situation of college network information security protection in the era of digital economy**

### **3.1. Insufficient attention to network information security**

Colleges and universities are important places to carry out higher education, and the teaching environment is characterized by openness. Because most of the staff in colleges and universities are free to enter and leave, they are both complicated and intensive in terms of personnel. The use and flow of various electronic devices on campus provide "opportunities" for network and virus attacks <sup>[4]</sup>. In addition, the information construction process of colleges and universities is gradually accelerating, and the network information security protection system of colleges and universities is not perfect, which results in the lack of awareness of network information security of teachers and students, and the lack of attention to it, and the security awareness is relatively weak. They tend to pay more attention to the shallow layer of network information, which may lead to a lack of in-depth understanding of information security risks <sup>[5]</sup>. Some administrators of colleges and universities also have

defects in the cognition of network information security accidents, treating them as small probability events, but ignoring the harm brought by them, and then investing less, so that many people with bad intentions can take advantage of it.

### **3.2. Lack of ability of network information method**

According to the author's survey of relevant colleges and universities, although qualified colleges and universities have made some achievements in information construction, they have begun the construction of information systems and set up information management departments <sup>[6]</sup>. However, because the work of colleges and universities focuses on the maintenance and construction of information technology, the measures on how to prevent it are not perfect. At the same time, the person in charge of network information management in colleges and universities is generally the faculty and staff of the school. Their information literacy is low, and they lack the ability to prevent it in terms of consciousness and ability. It is precisely because colleges and universities pay less attention to this aspect, the talent reserve is also at a disadvantage, which leads to the training of relevant personnel is not enough to meet the actual demand <sup>[7]</sup>.

### **3.3. The omission of information security protection mechanism**

The construction of network information security protection mechanism needs to be analyzed from both virtual and realistic aspects, as follows: On the virtual level, its main content is an information firewall, which has the function of lower than network virus intrusion; In reality, the intrusion of network information security in colleges and universities not only needs to find the weak points of the virtual world but also needs to improve the hardware facilities <sup>[8]</sup>. Given the current college network information security protection mechanism is not perfect, or failed to play a role, the lack of support of relevant technical personnel <sup>[9]</sup>.

## **4. College network information security protection strategy in the digital economy era**

### **4.1. Strengthen the management of network information security in colleges and universities**

In the era of the digital economy, cyberspace has become more complex, making the development of emerging technologies such as big data, cloud computing technology, and the Internet of Things more in-depth. With the rapid development of Internet technology, intelligent crimes, and data leakage channels have become more diverse, making people impossible to defend against. To maintain the network information security of colleges and universities, improve the level of protection, and achieve the expected protection goals, colleges and universities need to take system management as the core, through training or other ways to improve the awareness of relevant personnel in colleges and universities <sup>[10]</sup>. Network information security protection work requires personnel to possess expertise in professional computer technology and mastery of computer maintenance. Management personnel need to have a profound understanding of network information security in teaching and scientific research. The implementation of network security supervision standards in practice is crucial, and there should be a unified ideological understanding of network information security protection requirements. For the smooth development of network information security protection work, it is imperative to have rules and regulations as constraints to ensure proper regulation. In this regard, the author believes that administrators need to combine the actual situation of the network environment of colleges and universities, improve the current network information security management mechanism, and carry out overall planning for all links. For some network emergencies that may occur in the new era, managers should make plans in advance

to avoid network information security incidents caused by improper preparation in the early stage, prevent failure to deal with emergencies in time and expand the harm of events. In addition, colleges and universities also need to improve the level of information management, refine every detail of management, increase management efforts in the management process, and implement the principle of “responsibility to people” in place.

## **4.2. Improve all aspects of network information security protection**

### **4.2.1. Advance protection**

Prior protection refers to the scientific deployment of information security equipment using more advanced technical means to make it capable of resisting external attacks. Colleges and universities can take measures from the three aspects of network communication security, host security, and physical security to establish an effective barrier for college network protection. From the perspective of network communication security, colleges and universities can deploy firewalls between the campus Intranet and the Internet border, and between different departments, and use the firewall to scan the network traffic passing through it, thereby identifying whether there is a network attack. From the perspective of host security, colleges and universities should pay attention to the patch and update of the host to ensure that the vulnerabilities in the system can be solved <sup>[11]</sup>. In addition, colleges and universities can also choose the virus software with high performance, update the virus signature code in time, and realize comprehensive monitoring. From the perspective of physical security, it can ensure the network information security of colleges and universities, colleges and universities need to set up advanced electronic access control systems in scientific research departments, computer rooms, and other places to achieve control and record of personnel. If there is a security accident, the existing monitoring records can provide a basis for this.

### **4.2.2. Protect during an incident**

Protection refers to the university network information security accidents, such as network attacks or data leaks, the application of the information system has been set up to achieve the capture of the event. The system usually has the function of active blocking. If it encounters an extreme situation, it can pass the emergency to the management personnel and take necessary manual intervention. In the era of the digital economy, the network environment has become more complex and changeable, and the methods of attacking the network system have become more diversified. If the initial network security monitoring equipment is adopted, it is difficult to effectively block the network attack, which means that there are still strong risks in network security. Therefore, colleges and universities can choose the security perception platform supported by big data technology, which is the scope of active protection of colleges and universities <sup>[12]</sup>.

### **4.2.3. Post-event protection**

The function of this layer is to fully resist network attacks and minimize the damage caused by network attacks. After the event, the defense can find the source and path of the attack, locate the vulnerability, and take appropriate measures in time <sup>[13]</sup>. What should not be ignored is that post-event traceability also requires the use of big data technology, and the application of a security awareness platform, as far as possible to expand the association scenario, to obtain comprehensive data sources. Generally speaking, each cyber attack consists of seven stages, and each stage involves different data sources. Therefore, post-processing must find the data sources of each stage to find the complete attack chain and determine the cause of the attack.



### **4.3. Strengthen awareness of network information security protection**

Generally speaking, as long as it is a network information system, because of its particularity, it is difficult to completely avoid the problem of loopholes, and it is difficult to completely block the information loopholes. Therefore, to further protect the complete network information of colleges and universities and avoid information leakage, it is necessary to deepen the awareness of network information security prevention of relevant personnel from the root. Relevant personnel can use their knowledge and skills to design anti-virus software suitable for the school and regularly check the anti-virus software, such as system loopholes found in time to repair <sup>[14]</sup>. Based on the current era of the digital economy, the data information of the network information system of colleges and universities is growing rapidly every day, and at the same time, problems such as hacker intrusion, improper operation, and network loopholes are emerging endlessly. To ensure the security of college network information, it is not only necessary to formulate the working criteria for the repair of system loopholes but also to further deepen the awareness of relevant personnel. College network information security management organization needs to face the whole school staff and students, the school can carry out regular publicity activities, so that teachers and students on the deepening of network information security, but also can correct attitudes, understand and grasp the way of information leakage. When using the network platform for teaching, they should know how to avoid the risk of information leakage, greatly improve the network information security prevention ability on the original basis, and reduce the probability of network information security incidents <sup>[15]</sup>.

## **5. Conclusion**

To sum up, the era of the digital economy has been an irreversible trend. It is also a general trend for colleges and universities to apply information technology in this context and accelerate the process of information development, which means that the threat of network information security cannot be avoided. Given the significance of network information security protection in colleges and universities, along with the existing challenges, this paper proposes to enhance the management of network information security in colleges and universities, improve every aspect of network information security protection, raise awareness of network information security protection, and suggest adopting advanced information security protection measures. It is hoped that through efforts from various perspectives, assistance can be provided for network information security protection, thereby ensuring the best possible information security for colleges and universities in the era of the digital economy.

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