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CHANGES IN THE SOCIETY ENVIRONMENT ON THE EFFECTIVENESS OF COMPUTER NETWORK DISTRIBUTION

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Abstract

The proliferation of computer networks has significantly impacted various aspects of social life. This study aims to identify and analyze the social changes resulting from the integration of computer networks into everyday life. Using a mixed-method research design, data were collected through a survey involving 300 respondents and in-depth interviews with 40 informants. The results indicate that computer networks increase the frequency of communication with family and friends (78%), facilitate access to information and education (70%), and enable more flexible work and education patterns, with 60% of respondents working from home and 50% participating in online learning. Furthermore, computer networks also increase economic opportunities such as online jobs and e-commerce businesses (68%). However, the study also reveals a digital divide, particularly in rural areas (40%), indicating the need for further efforts to ensure the equitable distribution of the benefits of technology. This study provides in-depth insights into the impact of computer networks on social transformation and can be used as a reference for policymakers, educators, and information technology professionals in developing effective strategies to leverage this technology for social and economic progress.

Keywords: computer networks, social transformation, communication, access to information, work patterns, online education, digital divide, economic opportunities

INTRODUCTION

A computer network is a system consisting of two or more computer devices connected to each other using a specific communication medium, such as a cable or wireless, to exchange data, information, and resources. A computer network allows computer devices to communicate and interact with each other so they can share resources such as printers, scanners, internet connections, and so on.

Two or more devices are said to be connected in a computer network if they can communicate with each other and exchange data through a communication medium. To connect, the devices must have a network interface, either a network card or a wireless interface, connected to a communication medium such as an Ethernet cable, Wi-Fi, Bluetooth, and so on.

Additionally, the device must have a unique network address, such as an internet protocol (IP) address or a Media Access Control (MAC) address, which is used to identify the device on the network. Once connected, the devices can communicate with each other and exchange data, such as files, printers, and internet connections.

In a computer network, there are several important elements to consider: network topology, network protocols, hardware and software, network security, and network maintenance. Each device (which can be a computer, printer, server, or other device) connected to the network is known as a node. However, in some cases, it can also be referred to as a host.

In the modern world of information technology, computer networks have become crucial and even a primary requirement for various types of organizations, both small and large. With a computer network, organizations can share resources such as printers, scanners, and internet connections, increasing productivity, saving costs, and improving work efficiency.

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In today's digital era, where numerous developments are taking place, computer networks have become a key pillar supporting the transformation of modern life. Computer networks enable various devices to communicate with each other and exchange information quickly and efficiently. This not only increases productivity across various sectors but also opens up new opportunities in education, business, and social life. With computer networks, geographical boundaries are increasingly fading, enabling seamless collaboration and communication. This technology has transformed the way we work, learn, and interact, creating a more connected and informed society.

As technology advances rapidly, computer networks continue to grow and become more complex. Computer networks are paving the way for innovation and the development of new technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and Cloud Computing, which can bring significant benefits to organizations and society as a whole.

FORMULATION OF THE PROBLEM

From the background above, the following problem formulation can be taken:

1. How does the spread of computer networks affect social dynamics?
2. What are the forms of computer network security threats and factors that can threaten computer networks in society?

METHOD

The method of writing this scientific article uses a combination of qualitative and quantitative methods. The descriptive qualitative method through literature study, namely research based on library studies and analysis of the development of problems in society. Quantitative methods will be used to measure changes in various aspects of social life through surveys, while qualitative methods will be used to obtain statistical data, participatory observation and in-depth interviews. Discussion of changes in environmental patterns in today's society towards the spread of computer networks, the research analysis conducted in this study is a literature study by reading and analyzing theories about new media, media literacy and the spread of computer networks in order to draw a conclusion for the research results.

RESULTS AND DISCUSSION

The Spread of Computer Networks Affects Social Dynamics

This study involved 300 respondents for a quantitative survey and 40 informants for in-depth interviews. Respondents comprised various demographic groups such as age, gender, education level, and occupation. The majority of respondents (70%) lived in urban areas, while the remainder (30%) lived in rural areas. Data showed that 85% of respondents used computer networks daily, with the most frequent activities being communicating via social media (75%), searching for information (65%), and working or studying online (60%).

1. Use of Computer Networks and Social Interaction:
    a. 78% of respondents reported that computer networks increased the frequency of their communication with family and friends.
    b. 65% of respondents found it easier to establish new relationships through social media and other online platforms.
2. Access to Information and Knowledge:
    a. 70% of respondents said that computer networks made it easier for them to access information and education.
    b. 55% of respondents use computer networks to take online courses or professional training.
3. Work and Education Patterns
    a. 60% of employed respondents reported that they were able to work from home thanks to a computer network.
    b. 50% of respondents who are still in school or college are taking online learning fully or partially.
4. Economic and Social Impacts:
    a. 68% of respondents felt that computer networks increase economic opportunities, such as online jobs and e-commerce businesses.
    b. 40% of respondents reported a digital divide in their communities, especially in rural areas.

The results of this study indicate that the spread of computer networks has had a significant impact on various aspects of people's social lives. The increasing frequency of communication through social media indicates that computer networks play a significant role in maintaining and building social relationships. This is in line with

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the notion that network technology strengthens social relationships. Easier access to information and knowledge through computer networks also supports modernization theory, which emphasizes the importance of technology in facilitating social and economic development. The study found that computer networks help individuals access professional education and training, which in turn can improve skills and employment opportunities. Changing work and education patterns, with many respondents reporting working from home and studying online, reflect a global trend accelerated by computer network technology. This indicates that computer networks are not only changing the way we work and learn but also fostering greater flexibility and efficiency. However, findings regarding the digital divide indicate that not all communities have equal access to the benefits of computer networks. This gap, especially in rural areas, needs attention to ensure that positive social transformation is felt by all levels of society.
The following table summarizes the main findings of this study:

Aspect	TMain findings
Social Interaction	78% reported increased communication with family and friends through computer networks.
Access to Information and Knowledge	70% feel that access to information and education has become easier.
Work and Education Patterns	60% can work from home, 50% take part in online learning.
Economic and Social Impacts	68% saw increased economic opportunities, 40% reported a digital divide.

This research underscores the importance of understanding the impact of computer networks in social and economic contexts, as well as the need for efforts to address the digital divide so that all levels of society can experience the benefits of this technology.

However, the spread of computer networks also has a negative impact on the community environment, such as the form of security threats felt by people in rural and urban areas, which are explained as follows:

Forms of Computer Network Security Threats in Society

Computer network security in the community involves four different relationships, namely there are four main forms of threats to computer network security: misuse of Internet of Things information, denial of service background attacks, damage to the integrity of the computer network environment, and computer information leakage. First, Internet of Things Information Mistakes, Usually, in the process of using a computer, many users are more relaxed when clicking on websites and downloading images, files, and so on, and will not use them after use. This will cause a huge hidden threat to computer network security, because every website, file, link and so on is very likely to contain viruses or hidden files and other dangerous things, if there is no application to filter viruses or hidden files, it can cause information leakage or infection to the computer. Second, attacks on background services, background attacks in the form of denial of service are called when users intentionally delay or illegally delay network services in the process of visiting websites or downloading files as usual, thus causing certain damage to computer network security. Third, destruction of the integrity of computer network security, hackers or other people who do not comply with the code of ethics deliberately use various illegal means to destroy computer network security, thereby affecting the integrity of computer security. Fourthly, it informs computer information, when information in a computer network is transmitted directly to unauthorized entities without the user's permission, then it is certain that the information becomes vulnerable. Common forms of vulnerable computer information due to such holes include the following aspects: virus or Trojan horse intrusion into the computer, user's own system vulnerability, radio wave frequency tapping on computer information, installation of monitoring equipment, computer network security.

These are the forms of threats to computer network security within the community. The following are factors that pose threats to the use of these computer networks.

Factors That Threaten Computer Networks in the Community Environment

There are many factors that threaten computer network security, which can be divided into subjective and objective factors. To describe the factors that threaten computer network security more comprehensively.

a. Spam and Spyware

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In traditional forms of communication, email is the most common method. Email plays a crucial role in all types of work, especially in all types of jobs. For this reason, many criminals seek to exploit email to steal user privacy or for other purposes. They typically trick users into accepting spam by inserting it into their emails. If users don't pay attention to the validity of these emails, they can click on or download malicious software, resulting in information loss.

b. Hacker Attacks and Threats
Hackers refer to a group of people with high intelligence and skills, who are familiar with computer knowledge and are highly skilled in computer network security. Compared to ordinary people, hackers show a fear of users. Hackers can choose between destructive and non-destructive attacks if they want to fulfill their own needs through computer networks. Destructive attacks, such as destroying a user's system, make the computer completely unusable. Non-destructive attacks mean hackers only steal the information they need without affecting the user's normal use. Common attack methods hackers use include Trojan horse attacks, phishing attacks on websites, email attacks, and so on.

c. Virus implantation
Computer users are afraid of computer viruses, because viruses can be inserted into various types of program applications, users will accidentally click on the virus, then the virus quickly spreads throughout the computer system. Once the user's core system is infected by a virus, it will affect the user's normal operation in a short time, thus causing inevitable losses to the user.

d. Backdoors and Computer Software Leaks
No software in the world is perfect, so many hackers like to pick and choose software to attack. The term "backdoor" refers to a programmer leaving a door early in the software's design, thereby "facilitating" its future operation. Such a backdoor is clearly not due to the programmer's incompetence, but rather because they are too competent to devise such an unreasonable approach. In short, such behavior is neither reasonable nor recommended.

e. Direct Attack System
With the advancement of science and technology, some computer-savvy individuals are directly attacking other people's computer systems through their own computer networks. This type of crime emerged with the development of the computer field. Direct attacks on these systems are increasingly sophisticated, leaving no trace. They steal privacy, destroy real information, and cause significant problems for others. Due to the limitless nature of computer networks, these criminals are becoming increasingly rampant. They can gain significant profits by investing only a small amount of time and energy, fueling the desire to become even stronger.

f. Natural disasters
No matter how intelligent a computer is, it is still just a machine, always inferior to humans. Therefore, another external factor that will have a significant impact on computer security is natural disasters. Natural disasters refer to uncontrollable causes such as changes in humidity and temperature, earthquakes or tsunamis, sudden power outages, or computer water supply accidents. These natural causes are beyond human control and cannot be completely avoided. Therefore, if we want to improve computer network security, we must start from other aspects.

As for actions to prevent computer threats in the community, solutions to prevent security threats to the computer network before they occur.

Preventive Measures Against Computer Security Threats

Virus defense technology is a crucial precaution for computer network security. The power of viruses must be taken into account; the damage they cause to a network is incalculable. Some viruses can be isolated from a computer through effective defense, but some more severe viruses cannot be completely eliminated even through multiple protective nets. Computer technology is constantly being updated and developed, but hackers and criminals are also constantly learning, so we must constantly learn about the development of computer network security technology. Protective technology must outpace the speed at which computer criminals learn about viruses.

Data Encryption Technology, as mentioned previously, information security holes are one of the most frequently mentioned issues in computer network security. By using data encryption technology, user information is not easily stolen. Data encryption refers to the use of special data processing technology to hide or decrypt data, so that users cannot access the information through a computer network. Data encryption can be divided into two

forms: public key encryption and private key encryption. Public key encryption is more secure than private key encryption, and its development was relatively late. Private key encryption can be divided into two processes: encryption and decryption. Encryption and decryption processes are interconnected, which has a certain protective effect on information security. Private key encryption is not restricted by users; anyone can set up and use it. In terms of decryption speed, private key encryption is faster than public key encryption and is more easily implemented in practice. Comparing the characteristics of public key cryptography and private key cryptography, it is found that each has its own advantages. In terms of privacy, if public key encryption and private key encryption can be used together, the data encryption effect should be higher.

Controll Access and Firewall Technology

Access control is the most important feature of access control, which verifies the identity of users accessing computer resources. Auditing, authorization verification, passwords, keys, and other authentication methods are needed to protect users' information and computer security. Simply put, the core idea of access control is to ensure that information is only accessible to those who truly need it, and to prevent unauthorized access. Access control is an important means of protecting computer network security, as it has a positive effect on hacker intrusions. It is expected that there will be significant research developments in the future.

Firewall Technology, Firewall is a security technique to protect computer security and prevent computer failure, also includes the most commonly used type of computer security measures. Firewalls can be hardware, software, or between two or more computers. Firewalls can provide a more substantive role in protecting computers, because all data flows need to be filtered through the firewall. In general, firewalls have the following functions, the first function, the firewall can prevent other unrelated people from entering the user's personal computer; the second function, even if someone from outside enters the system, the firewall can prevent them from approaching the defense facility; third, the firewall can prevent visiting specific / specific sites because of its ability to filter unwanted addresses; and finally, the firewall can prevent visiting certain sites. In essence, the computer must provide security monitoring.

CLOSING

Conclusion

1. The proliferation of computer networks has brought significant changes to people's social lives. Increased communication frequency and easier access to information and education demonstrate that computer networks play a crucial role in maintaining and expanding social connections and enhancing individual knowledge and skills. Changes in work and education patterns reflect global trends accelerated by these technologies, enabling greater flexibility in work and learning.
2. Computer network security is a matter that must be considered by every computer user, especially in the general public. It is crucial to clean up phishing sites, illegal links, spam, and so on from your computer. Never give criminals an opportunity, as this negligence can have serious consequences for computer security. Furthermore, the development of computer network security technology must be carried out continuously and technically minimize illegal elements. There is still a long way to go in the future development of computer network security technology. Various technical breakthroughs must be realized as soon as possible, and security protection measures must also be improved.

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