Analysis on the Change of Big Data and Computer Network Communication Technology Based on Multi-platform

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Abstract: Since the 20th century, information and network technology, mainly represented by microelectronics, computer communication and network technology, has progressed and developed rapidly, and its dissemination and application have had a significant impact on economic development and social transformation. Among them, modern computer communication is an emerging discipline that effectively combines modern computer technology and communication technology. It has developed rapidly after experiencing the information revolution, which has greatly changed the daily work and lifestyle of people in modern society, and the changes in communication have also changed. After entering the new era, the conversion stage from analog signal to digitization to communication signal has basically ended. However, in the field of modern digital communication, there is still a lot of room for the advancement and development of electronic computer technology. Many new technologies and new technologies are emerging in an endless stream, which also provides ample room for future development of the industry. This article analyzes the transformation of computer network communication technology based on multi-platform data. First, use literature research methods to analyze the advantages of computer network communication technology in the era of big data. And summarize the problems of computer network general technology, and then use questionnaires based on big data platform to investigate the impact of computer network communication technology changes on people and the failure of computer network communication in life. The result shows that the video upload fails. The occurrence is very high. About 60% of people have experienced video upload failures. There are relatively few failures in hacking and image upload failures. This shows that the solution to the information network security problem in China is still possible, but the video high incidence of upload failures indicates that the speed of computer network communication needs to be strengthened. The direct impact of the reform of computer network technology is that people have more frequent contacts. About 50% of people have more frequent contacts with family and friends after the reform of computer network technology.

Keywords: Big Data, Computer Network, Multi-platform, Communication Technology
1. Introduction
The era of great data has brought great ease to people's lives and work [1-2], and also has a specific impact on computer development [3-4]. The era of large data sets higher requirements for computer network communication technology. In order to achieve better development of computers in the era of large data [5-6]. In order to ensure that telecommunications technology can play its full role and value and provide guarantees for human life, technological innovation is necessary[7-8].

Many scholars have conducted research on the multi-platform-based big data and computer network communication technology revolution research, and achieved good results. For example, Kim YW proposed that the transformation of computer network communication technology can not only improve the production efficiency of the information and communication technology industry, but also improve the comprehensive production efficiency of these industries through application in traditional industries, thus becoming the main driving force for economic growth [9]. Li Y pointed out that the global Internet technology has developed rapidly in the past ten years and its application has become more and more in-depth, which poses a strong challenge to the traditional telecommunications industry. The emergence of Internet technology has completely changed the connotation of the traditional communications industry, lengthening the industrial chain and integrating more traditional industries into the information industry chain. Industries such as traditional publishing, traditional media, and traditional entertainment will, under the influence of information technology, change the previous channel model and form a new industrial form. The emergence of the Internet has formed global procurement activities, profoundly changing the pattern of global business competition [10].

This article first uses the literature research method to summarize the advantages of computer network communication technology in the era of big data and the problems of computer network general technology, and then uses a questionnaire based on the big data platform to investigate the impact of computer network communication technology changes on the service industry, according to The result analyzes the trend of computer network communication technology change.

2. Research on Multi-Platform Big Data and Computer Network Communication Technology

2.1 Research Methods
(1) Literature research method
The main purpose of the literature research method is to broadly refer to that scholars can obtain research data through various methods such as various books, newspapers, magazines, and electronic readings that they need to consult, and generate scientific research ideas and inspirations. Its greatest advantage is that we can understand the historical changes and development history of the object to be studied from our own sources, and understand the historical changes of the object to be studied. Through comparison with relevant data, we can promote a more comprehensive understanding of the objects we need to study

(2) Qualitative analysis method
Qualitative analysis is related to quantitative analysis. Quantitative analysis refers to the determination of mathematical assumptions, data collection, analysis and testing.

Qualitative analysis refers to the qualitative analysis of the research object. It refers to the process of conducting research based on subjective understanding and qualitative analysis, through research and bibliographic analysis.

(3) Investigation and research method
The questionnaire survey method is that this article conducts a survey through pre-prepared questions and analyzes the answers of the interviewees to draw the necessary conclusions. Through the design of questionnaires, understand the views and attitudes of the research objects on the reform of computer network communication technology

2.2 The Characteristics of Computer Network Communication Technology
(1) Make data transmission more secure. Computer technology is transmitted through binary numbers, which are different from our traditional analog signals. Data information is transmitted in pulses of up to 470,000 characters per second. With the continuous update of modern information technology, the transmission of data will continue to occur. For example, the current optical fiber is gradually being replaced with traditional cables. The computer communication system can use binary to convert multimedia information, encrypt and then send, thus effectively ensuring the security of data information and effectively preventing the theft and omission of information.

(2) The computer communication response time is short. In an ordinary twisted pair cable, computer communication data is less than 1.1 seconds, and under normal long-distance conditions, it is less than 6 seconds. The situation will be worse if you use fiber optics, the traditional analog signal exceeds 16 seconds, sometimes up to a few minutes.

2.3 Advantages of Computer Network Communication Technology in the Era of Big Data

(1) The communication technology of the computer network has a strong anti-interference capability, because in today's age of the Internet and large data, a lot of network and data information will be produced every day, and a lot of information and data must be transmitted to the electronic network. Only to ensure that the process of transmission of information is not affected and is not hindered for other reasons, but can also ensure data and information security, at the same time ensure better use of data and information, ensure the authenticity of the data and the effectiveness of the information, resolve problems and resolve data distortion and other information transmission problems to the greatest extent.

(2) 5G technology has been created. Computer network communication technology can be combined with 5g technology. In addition, may be compatible with multiple mobile devices to ensure data transmission.

2.4 Problems in Computer Network Communication Technology

(1) Potential problems of network communication. The widespread use of computer network technology will inevitably bring some hidden dangers. If the network communication fails, on the one hand, information is stolen and criminals can use it; on the other hand, it will cause economic losses to the society and the people. Therefore, the environmental security of the computer communication network must be solved. For example, hackers break into computer web pages, use windows on the network to conduct activities that do not comply with the law, obtain information from other people or violate information for profit. This behavior hinders the development of my country's communication network and also makes people lose confidence in new technologies. Therefore, the security of computer network communication must be ensured.

(2) Technical problems of the communication network. Although my country's communication technology has developed rapidly and computer performance has been steadily improved, it cannot meet the technical requirements of people in the information society. For example, wireless network allocation issues. The ultimate requirement of computer network communication is to distribute the network to each site. Due to environmental and site restrictions, the network reception conditions in each area will be different. If information transmission is hindered, people’s communications will be severely affected. Inadequate network coverage in my country's rural areas and remote mountainous areas will prevent people from obtaining new information, making the region even more backward and underdeveloped.

2.5 Big Data Algorithm

(1) Min count algorithm

The probability density function sets x as a random variable. If there is a non-negative real number f(x), so that for any real number a<b, there is \( P\{a \leq x < b\} = \int f(x) dx \), then X is called continuous Type random variable, f(x) is the probability density function of x. The Min Count algorithm was proposed in Reference 667. The algorithm performs cardinality estimation based on the statistical information of the
hash result. As the name implies, it is based on the minimum value of the sequence to estimate the cardinality. Assuming that the minimum value of the hash result of all elements in the multiset is X, the algorithm approximates that the estimate of the set cardinality n is one. (1) The minimum probability density f(x) of n random X-machine uniform variables in the interval is n \((1-x)^{n-1}\), so the mathematical expectation of the minimum value satisfies the following equation:

\[
E(M) = \int_0^1 x \cdot n(n-1)^{n-1} dx = \frac{1}{n+1}. \tag{1}
\]

According to the calculation result of the minimum mathematical expectation of the interval \([0,1]\), it is easy to think of: when one is expected, its value is approximately equal to M. When the min Count algorithm is analyzed and studied mathematically, it is found that \(x=0\) is one. Mathematical expectation integral equation-a divergence point, the following formula:

\[
E\left(\frac{1}{M}\right) = \int_0^1 \frac{1}{x} \cdot n(1-x)^{n-1} dx = +\infty \tag{2}
\]

(2) LogLog Counting algorithm

The main idea of the algorithm: For the data set D, scan all the elements x in the set, and for each element x scanned, it is mapped into a binary bit string of \(\{0,1\}\) through a hash function, denoted by \(p(x)\) The position where the first number "1" appears in the binary bit string, such as \(p(,...,p_0(00..)=2,\) etc., when all elements in the set are hashed, record the first hash result. The maximum value of the position where "1" appears, expressed by \(pmx(x)\), can be considered as the base estimate:

\[
E = 2^{\rho_{\text{max}}(x)} \tag{3}
\]

3. Investigation on the Change of Big Data and Computer Network Communication Technology Based on Multiple Platforms

3.1 Research Purpose

Use questionnaires based on big data platforms to investigate the failures of computer network communication in life and the impact of technological changes on people. Based on the results, analyze where the computer network communication technology should be reformed.

3.2 Questionnaire Survey

(1) Number of questionnaires

According to the minimum sample size formula in statistics, the author sets the confidence level of the questionnaire to 80%, and the allowable error does not exceed 8%. Calculate the minimum sample size as

\[
n_0 = \left(\frac{t_{\alpha/2}}{2\delta}\right)^2 = \left(\frac{1.645}{2\times0.075}\right)^2 = 120 \tag{4}
\]

(2) Data source

There are a wide range of users of computer network communication, and there are no major restrictions on age, gender, and region, so there is no specific field of research topic. The way to distribute the questionnaire is: mainly conduct online surveys on the Star questionnaire website, and secondly distribute the printed questionnaires and conduct interviews between relatives and friends.

4. Data Analysis

This article uses questionnaires to investigate some of the failures of computer network communication in life. The results of the survey are shown in Table 1.

**Table 1. Failure of computer network communication in daily life**

|                  | male | women |
|------------------|------|-------|
| Picture upload failed | 23%  | 22%   |
| Video upload failed   | 56%  | 58%   |
| Hacker attack        | 21%  | 21%   |
It can be seen from Figure 1 that the failures of video upload failures are very high. About 60% of people have experienced video upload failures. There are relatively few failures in hacking and image upload failures. This can be seen in my country’s information. The network security problem can be solved, but the frequency of video upload failure is relatively high, indicating that the speed of computer network communication needs to be strengthened.

This article uses questionnaire surveys to investigate the impact of computer network communication technology on people. The results of the survey are in Table 2:

**Table 2. The influence of the change of computer network communication technology on people**

|                                    | male | women |
|------------------------------------|------|-------|
| The universality of communication  | 34%  | 20%   |
| Frequent communication              | 40%  | 55%   |
| The convenience of communication    | 36%  | 35%   |

![Bar chart showing the influence of change of computer network communication technology on people](image)

**Fig 2. The influence of the change of computer network communication technology on people**
It can be seen from Figure 2 that the direct impact of the reform of computer network technology is that people have more frequent communication. After the reform of computer network technology, about 50% of people have more frequent communication with family and friends.

5. Conclusions
With the continuous progress of society and the advent of the era of big data, a large amount of information data has penetrated into people's daily life, and a large amount of information has provided people with convenience and improved people's quality of life. The advent of the era of big data has brought convenience to people. At the same time, people should not underestimate the problems of computer communication technology in the era of big data. These problems will affect the quality and performance of computer network communications. Therefore, it is necessary to carry out continuous reforms according to the characteristics of the big data era to ensure perfect remote computer communication and good network security, thereby ensuring data transmission. People can use big data to change their lifestyles and use modern technology to continuously promote social development.

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