

Computer Network Security Maintenance and Management in the Era of Big Data

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ABSTRACT

With the development of information technology, the big data network has been initially formed. However, the network security problem is becoming more and more serious in this environment. China has put network security in an important position of national security. This paper analyzes the text of China's network security governance policy from the perspective of big data, builds an analysis framework based on big data, analyzes the relevant provisions of China's network security governance policy, analyzes the existing problems and puts forward optimization suggestions, in order to provide reference for the formulation of China's network security governance policy and improve China's network security governance policy system. This paper collects the information of network security incidents and policies in 2020 from Google data analysis platform. After preliminary collection and sorting, 195 relevant policies on network security governance are obtained. In order to ensure the accuracy and pertinence of the materials, all policies are analyzed. The research results show that the application of some big data of network security governance is concentrated on the regulatory level, lacking specific implementation rules and methods. There are 183 policies involving regulatory control, accounting for 31.6%. Therefore, the national network information department should cooperate with the legislative department to formulate policies for the problems in the network ecosystem. Network is not only the extension of people's daily life, but also an important part of economic and social life.

KEYWORDS: Big Data Era, Computer Network Security, Maintenance and Management, Information Security

Introduction

With the development and popularization of network technology and network equipment, the Internet is widely integrated into life, and real society continues to expand into cyberspace.

Network has gradually become a necessity of people's daily life. However, with the rapid development of network technology and network industry economy, the problem of network security has become increasingly prominent.

As the Internet has gradually entered a period of thick accumulation from a period of steady progress, the attention of all parties to "network governance" is increasing. From the existing research results, researchers are concerned about the following issues: Governance of network ecology in combination with regional characteristics, Including the localization of governance according to the uniqueness of China's border areas and the comparison of other countries and China's network security law. . This paper analyzes the text of China's network security governance policy from the perspective of big data, builds an analysis framework based on big data, analyzes the relevant provisions of China's network security governance policy, analyzes the existing problems and puts forward optimization suggestions, in order to provide reference for the formulation of China's network security governance policy and improve China's network security governance policy system.

Network Security Management and Maintenance Model

After receiving the input data, the model first conducts feature learning through the DAE network and records the learning results. According to the learning results and DNN classifier, the input data is classified, and then the classification results are applied to the subsequent quantitative assessment process of the network security situation. Dae-dnn model can be used not only for binary classification, but also for multi classification

$$d_{jh} = \int_0^{\infty} dF_j(y) \int_0^y (y-x) dF_h(x) \quad (1)$$

The closer the value is to 1, the easier it is to be judged as abnormal flow. The calculation formula of sigmoid function (fsgm) is as follows:

$$f(x) = \frac{1}{Nh} \sum_{i=1}^N k\left(\frac{X_i - x}{h}\right) \quad (2)$$

The sum of the output values of each category is equal to 1. The model selects the category with the largest output value as the predicted category. The calculation formula of softmax function (fsfm) is as follows:

$$h_t = \tanh(w_c x_t + u_c (r_t \Theta h_{t-1}) + b_c) \quad (3)$$

In order to make the DNN classifier fully learn the feature extraction results of the DAE, improve the performance of the model and reduce the risk of over fitting, the daednn model is trained by stages. In order to obtain the training results of the DAE model, the weight value of

the DAE network in the daednn model is set to the reserved weight value, and the parameters of the DAE layer are set to untrainable, which is trained together with the DNN network

$$\sigma = \frac{\sqrt{\frac{1}{n} \sum_{i=1}^n (FI_{it} - FI_{it})^2}}{FI_{it}} \quad (4)$$

$$x_H = \frac{p_2 - p_1 + 1}{2} \quad (5)$$

Network Security Management and Maintenance Analysis

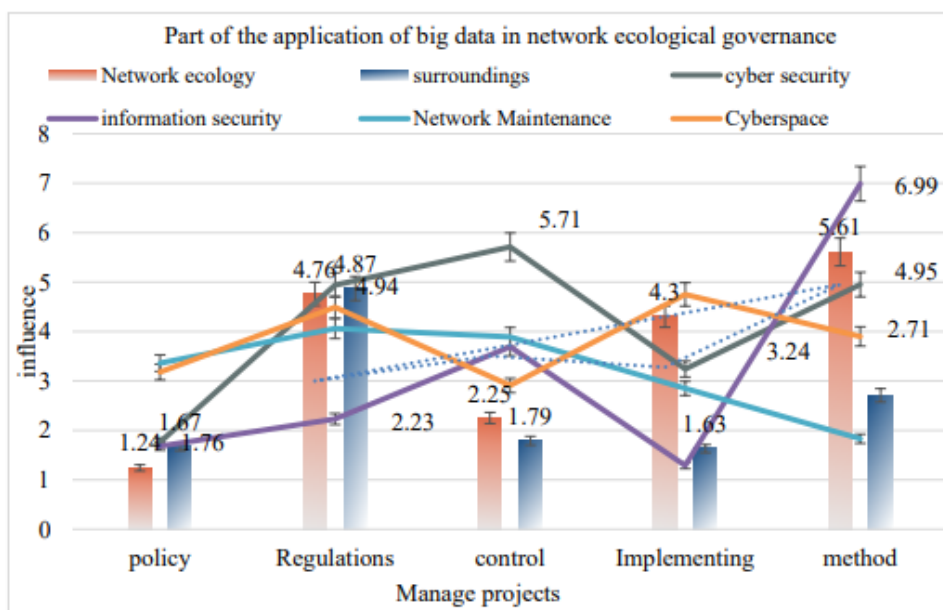
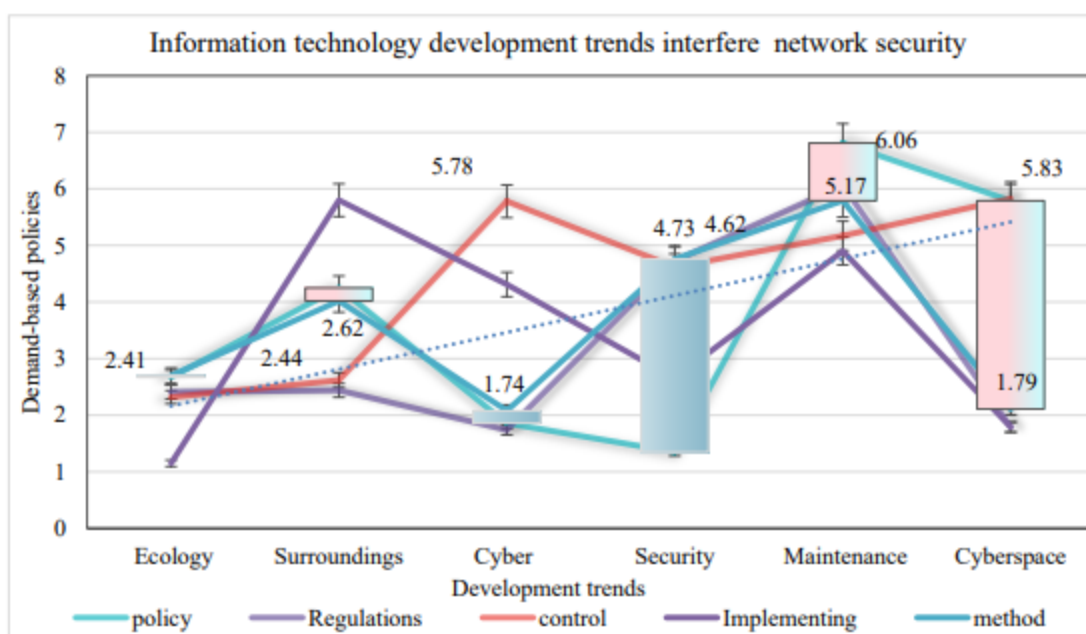


Figure 1.Part of the application of big data in network ecological governance

As shown in Figure 1, the application of some big data of network ecological governance is concentrated on the regulatory level, lacking specific implementation rules and methods. There are 183 policies involving regulatory control, accounting for 31.6%. Therefore, the national network information department should cooperate with the legislative department to formulate policies for the problems in the network ecosystem. Network is not only the extension of people's daily life, but also an important part of economic and social life. Therefore, we should improve the policies and regulations related to network ecological governance, enhance its operability, so as to form a more humanized and standardized network ecological environment.



As shown in Figure 2, the development of information technology will interfere with network security to a certain extent. Artificial intelligence has been used in the data acquisition, analysis, formation of judgment, and combat planning and other aspects of the human brain can not match

the advantages. The United States and other network developed countries have formulated and issued artificial intelligence strategies, and take artificial intelligence as an important means to maintain national security

Conclusions

The overflow of environmental big data in the big data of China's network ecological governance indicates that the current network ecological governance belongs to the big data under the administrative paradigm, lacks certain rationality and practicability, and is unable to solve the network security problems with uncertainty, which is not suitable for today's era environment of rapid development and change of network. Therefore, we should strengthen the use of supply-oriented big data and demand-oriented big data, optimize the structure of big data, and build a balanced network ecological governance big data system. Strengthening the use of demand-oriented big data can increase the stability of the network industry, and give better play to the governance role of big data under the macro guidance of the government, so as to establish a sound governance mechanism and improve the government's comprehensive allocation ability of network market resources. Increase the combination of big data in the network ecosystem elements. The network ecosystem is complex and diverse, and each problem involves multiple elements. A single big data cannot solve the problem effectively for a long time. Therefore, we should increase the combined use of big data in the network ecosystem elements, and give play to the comprehensive governance function of big data.