Enterprise Big Data Management and Analysis System Based on Cloud Computing

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Abstract. In a large information environment, business problems are characterized by high reliability, uncertainties, and informational difficulties. Response ability has exceeded the ability of enterprises to manage them. In order to solve this problem, this article presents a design idea for emergency management system based on cloud computing technology in large data environment. It analyzes the main operation modes of the disaster management cloud platform, including LAS, PaaS, and SaaS, to meet the complex disaster management in large data environment. Using the advantage of cloud computing platform to achieve enterprise information crisis management can help enterprises to obtain timely and accurate information, and reduce the cost of decision-making problem. Cooperative crisis management of large groups under large information circumstances is a complex interactive decision-making process. The process of pushing for information resolution and providing authorization for crisis management, as well as mechanisms for demobilization, coordination, and crisis management, the evaluation and elimination mechanism of crisis response risks, and the feedback and negotiation mechanism of disposal results are the problems that need to be solved in the crisis management decision support system under big data.

Keywords: cloud computing; Big data; Enterprise crisis; management system.

1 Introduction

By studying the background of enterprise crisis management, that is, analyzing the essence and characteristics of the "cloud" era, the powerful information computing and processing ability of cloud computing is combined with the enterprise crisis management system in order to find more effective means and methods to manage enterprise crisis [1]. This research is a systematic project, mainly aiming at the new changes brought by new technology to the public, government, media, information dissemination mode, crisis communication mode and enterprise management in the "cloud" era, and analyzing the new crisis situation and characteristics that may be faced in the process of enterprise management. On the basis of mastering the mechanism of enterprise crisis communication in the "cloud" era, and on the basis of the traditional enterprise crisis management method system, this paper explores a new crisis management model, crisis management mechanism, crisis management process, crisis management technology and crisis management method by using new scientific and technological means and concepts [2]. Finally, through the crisis management problems exposed by China enterprises in the process of coping with crisis events, the "cloud" technology theory is combined with enterprise crisis management.

2 Characteristics of enterprise crisis management under the big data network environment

2.1 frequent corporate crises

In recent years, there have been frequent enterprise crisis events in China market, and the frequency and harm of enterprise crisis are increasing day by day. Although the causes of crisis are different, it has brought obstacles and negative effects to the development of enterprises through the expansion and spread of the network. Take the automobile industry in recent two years as an example, there are Toyota recalls that broke out in 2009 and lasted for several years. In 2012, Volkswagen 7-speed DSG, BYD e6 car accident, Volkswagen China public relations door incident, Dongfeng Citroen Elysee taxi reduction incident, Jianghuai rusty door incident in 2013, Fox gas penetration incident, Maverick broken axle door incident and so on, and so on, and automobile enterprise crisis incidents emerge one after another. The internal quality and management of most local enterprises in China are not perfect, and their ability to resist risks is poor. When a crisis occurs, the decision-makers of enterprises often face untimely, incomplete or even inaccurate information, which leads to the damage of corporate image or product reputation. Sometimes a crisis is enough to make the long-term investment of enterprises go down the drain, and the image is destroyed or even withdrawn from the market [3-4].

2.2 Network communication boosts enterprise crisis

It is almost impossible to control the spread of information on the network, and the negative information of enterprises in the network, even rumors, fake news and false news. In a sense, the network has become a distribution center for some negative information, and complaints, rumors, product defects and deficiencies have been focused and amplified and spread rapidly. The emergence of a large number of negative data will attract a lot of attention in a short time, and the network can quickly form a large-scale and high-intensity public opinion for emergencies. Network communication has triggered the rapid escalation and development of enterprise crisis, and constantly spawned new crises. At the same time, the crisis information in network communication has been accelerating to spread and penetrate into the traditional communication field, and its destructive power has been further enhanced. At the same time, due to the weakening of corporate communication control, coupled with the anonymity and concealment of the network, corporate negative information is more likely to be used by competitors, and with the help of online public opinion to artificially expand publicity, even rumors and incitement, making enterprises hard to prevent [5].

3 Enterprise Crisis Management Based on Computing Big Data

The era of mass data has brought many opportunities for people to collect and analyze data. The large amount of non- structured and semi- structured data, as well as the large data analysis period, needs a large amount of resources to support. The core of cloud computing is to centralize the resources and maximize the efficiency to support specific applications. From the infrastructure provided by the cloud computing technology, large data crisis management can be applied to this platform, as shown in Figure 1, the cloud computing service model.

With the help of computing resources of cloud computing, work is distributed to dozens, hundreds or even thousands of computers through MapReduce-like framework, and a large amount of data can be collected and processed; With the help of cloud computing distributed storage services, a large amount of data can be effectively stored, and the cloud deployment and management of resources can realize resource sharing and provide resource support for big data crisis management; On-demand service and delivery ability under cloud computing provide the possibility for the application of enterprise crisis management under big data through high-performance expansion; The computing resources of cloud computing also ensure that complex data mining and analysis tasks can be processed in real time, thus completing the crisis early warning and analysis tasks of big data; Service availability and rapid delivery under cloud computing can reduce the complexity of crisis management under big data and improve the efficiency of enterprise crisis collaborative response decision-making [6].
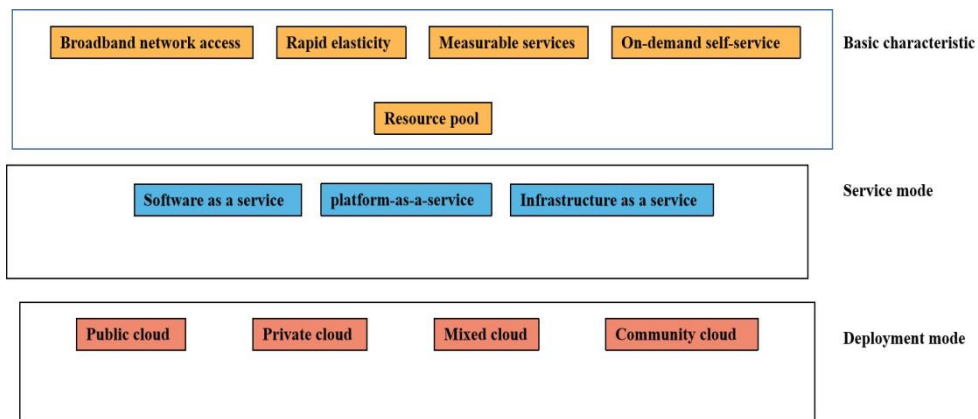

Figure. 1. Cloud computing service model

4 Cloud Computing Big Data Crisis Management System Framework

4.1 crisis management laaS cloud platform

Infrastructure as a Service (IaaS) provides a complete computer infrastructure and computing resources for crisis management system. Enterprise crisis management services are the utilization of all infrastructures, including data collection, preprocessing, storage and data management services [7].

Troubleshooting Information System: Data collection system is the center of enterprise information management system, which is often broken into different types of different information systems, with different information systems and structures.As shown in Table 1 and Table 2, it contains structured data such as organization, human resources, finance, manufacturing, market, etc. from MIS, ERP, financial management, SCM, CRM and other systems within the enterprise. Macro natural, political and economic environment information

from outside the enterprise, government policies, laws and regulations, and corporate public relations information mainly from media reports and online public opinion.

Table 1. Data Collection Indicators of Enterprise Crisis Management 1

Enterprise interior		
Crisis type	index	source
Organizational crisis	Organizational department structure	MIS、ERP
	Distribution of organizational functions	
	Operational efficiency of the organization	
	Organization's operating costs	
financial crisis	Asset-liability ratio	Financial system ERP
	Ratio of Profit to Capital	
	liquidity ratio	
	quick ratio	
production crisis	product percent of pass	SCM、ERP
	labor productivity	
	manufacturing technique	
	industrial accident	
Market crisis	market share	SCM、ERPCRM
	Sales growth rate	
	Price stability	
	User complaint rate	
	Stability of distribution channels	
	Marketing team stability	
Human resource crisis	Lack of talents	HR system
	Frequent flow of talents	
	Unreasonable talent structure	

Table 2. Data Collection Indicators of Enterprise Crisis Management 2

Enterprise interior		
Crisis type	index	source
Natural crisis	natural disaster	Government announcement public
	Man-made disaster	Information distribution
Political crisis	government policy	Government announcement
	Government ban	Analysis of political environment
	Regime alternation	
	military conflict	
	Terrorist activities	
Economic circumstances	Economic macro-environment	Government economic policy
	Industrial environment	Economic statistics
	industrial policy	Economic macro-environment analysis
	investment climate	
	technology standard	

	cultural context	
Public relations	Public-enterprise economy	Media coverage Internet public opinion
	Cognition of camp concept	
	Public perception of corporate brand image	
	Public perception of enterprise product image	
	Public perception of enterprise service level	
	Public's Cognition of Business Integrity of Enterprises	
	Public Cognition of Corporate Social Responsibility	

4.2 Crisis Management PaaS Cloud Platform

Platform as a Service (PaaS) provides an open application programming interface and development platform, and provides services such as crisis information discovery technology, crisis big data visualization technology and crisis management early warning.

Crisis information discovery technology: Cloud crisis discovery based on cloud computing is a new large-scale data analysis method, and data information discovery and analysis will be provided to decision makers as a service to support their crisis decision-making mouth [8-9]. Crisis monitoring and discovery must meet the needs of multi-source and massive information mining. With the help of data mining and knowledge discovery methods, we can find out the enterprise crisis information hidden in big data. First of all, through the enterprise's good crisis management system and the collection and arrangement of crisis data, the risks and threats in all aspects of enterprise operation are identified and analyzed, and potential business crises, institutional crises, management crises, security crises and competitive crises are found in time. Secondly, the information from outside the enterprise, among which the most influential is the public opinion information from the network, and the crisis monitoring mechanism and discovery technology for various information sources are established [10].

5 Conclusion

The arrival of the information big era has brought enormous problems to the enterprise management, but it also brought new challenges. By quickly capturing and analyzing the massive market information scattered in different systems, adjusting the enterprise management strategy in time and coping with the ever-changing market environment, risks can be turned into opportunities. In a word, crisis management in big data environment greatly increases the complexity of data collection and processing for enterprises. Enterprise crisis management based on cloud computing technology is an effective way to implement enterprise crisis management in the period of large-scale data. In today's complex and diversified information environment, managing the rapid emergence of large quantities of information in low cost and high efficient industries is a major challenge. The application of cloud computing technology to develop enterprise information management system that fits

the enterprise problem is a new idea. This article uses cloud computing technology to create enterprise crisis management in large-scale data,studies the system framework construction of three crisis management cloud service platforms, IaaS, PasS and SaaS, and analyzes their main implementation functions and technologies, so as to provide help for enterprises to carry out crisis management with low cost and high efficiency.

References

[1] Stergiou, C. L. , & Psannis, K. E. . (2022). Digital twin intelligent system for industrial iot-based big data management and analysis in cloud. Virtual Reality & Intelligent Hardware, 4(4), 279-291.

[2] Lv, X. , & Li, M. . (2021). Application and research of the intelligent management system based on internet of things technology in the era of big data. Mobile Information Systems, 2021(16), 1-6.

[3] Covei, D. P. , Canepa, E. C. , & Pirvu, T. A. . (2023). Stochastic production planning with regime switching. Journal of Industrial and Management Optimization, 19(3), 1697-1713.

[4] Srouji, D. , & Chronister, J. . (2022). Quality of reporting among systematic reviews underpinning the esc/acc guidelines on ventricular arrhythmias and sudden cardiac death. BMJ Evidence-Based Medicine, 7(N), 216-25.

[5] Edu, A. S. , Agoyi, M. , & Agozie, D. . (2021). Digital security vulnerabilities and threats implications for financial institutions deploying digital technology platforms and application: fmea and ftopsis analysis. PeerJ Computer Science, 7(e658), 1-26.

[6] Cheng, Z. , Ye, Y. , Huang, W. , Zhang, Y. , & Lan, L. . (2021). Research on power enterprise data model online management decision system based on big data. Journal of Physics: Conference Series, 1802(4), 042096 (7pp).

[7] Zou, T. , Bai, S. J. , & Rong, X. B. . (2021). Research on marketing management system based on independent erp and business bi using fuzzy topsis. Journal of Intelligent and Fuzzy Systems, 40(4), 1-9.

[8] Yang, H. , Yi, Z. , Wang, X. A. , Su, Y. , & Yang, X. . (2021). Improved lightweight cloud storage auditing protocol for shared medical data. Wireless Communications and Mobile Computing, 2021(21), 1-13.

[9] Zainab, A. , Ghrayeb, A. , Syed, D. , Abu-Rub, H. , & Bouhali, O. . (2021). Big data management in smart grids: technologies and challenges. IEEE Access, PP(99), 1-1.

[10] Yan, X. , Jin, S. , Yue, W. , & Takahashi, Y. . (2021). Performance analysis and system optimization of an energy-saving mechanism in cloud computing with correlated traffic. Journal of Industrial and Management Optimization, 18(5), 3133-3154.