

# The Training Path of Big Data Talents in the Chinese Government in the field of Emergency Management

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**Abstract**—In the field of emergency management, the number of big data talents in the Chinese government is small and the quality is poor. In order to cope with the public crisis events better and meet the actual needs of emergency management, the Chinese government needs to cultivate more excellent big data talents. By applying the documentation method and consulting the relevant research both at home and abroad, it is obtained the latest research trends in the training of big data talents in the field of emergency management. Based on the analysis of detailed data, it is found that the reasons for the shortage of the emergency management talents are due to the weakness of big data awareness of governmental personnel, the lack of specialized laws for the use of big data, and the unreasonable talent training mechanism. The training of big data talents of emergency management in Chinese government should strengthen the staff's awareness of big data, enact laws to normalize the use of big data, and innovate the training mechanism for big data talents. It will improve the quality of big data talents, increase the number of talents, and provide intellectual support for emergency management.

**Keywords**—Emergency management; Big data; Big data talents; Public crisis events

## I. INTRODUCTION

At present, Chinese economy and society are developing continuously, and there are many data generated every day. People live in an "Era of Big Data" which is filled with various data. Big data has been widely used in business, transportation, health care, military and other fields. Faced with the huge value of application, China attached great importance to the development of big data, and issued the "Outline for Promoting Big Data Development" in 2015, so as to use big data to develop the economy, improve people's livelihood, and ensure public safety. In the Age of Big Data, Chinese emergency management field has been brought new opportunities for development, but also great challenges, especially, the lack of big data talents in government emergency management is in urgent need of improvement.

## II. CURRENT STATUS OF GOVERNMENT BIG DATA TALENTS IN THE EMERGENCY MANAGEMENT FIELD

In China, the government occupies predominant position in the field of emergency management and plays a pivotal role. Adequate talent is an essential prerequisite for emergency management. However, in the Era of Big Data, the talents in

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the field of emergency management in the Chinese government are still difficult to satisfy the actual needs, mainly in the following two aspects.

### A. The number of big data talents is small

In recent years, with the continuous presentation of the value of big data, government, enterprises and society have gradually recognized the importance of big data. In the field of emergency management, the government can improve the quality, efficiency and intelligent level of decision-making by means of big data technology. Big data enhances the staff's capabilities of early warning, disposition, coordination, communication and rehabilitating in the public crisis events. Achieving these capabilities objectively requires the government to possess sufficient big data talents. However, at the present, the number of big data talents in the field of emergency management is still unsatisfied with the demands in reality, and it is difficult to change in the short term. Although there is no definitive official data on the number of big data talent gaps in China's emergency management field, evidence can be found in the data of big data talents and emergency management talents gap. "According to data from IT enquiry agency Gartner, big data created 4.4 million job vacancies worldwide up to 2015," "the global employment rate for big data-related jobs was only 30%" [1]. In terms of emergency management, "On the basis of preliminary predictions, by 2020, only the professional emergency rescue talents at all levels of China including national emergency rescue headquarters, rescue field work teams, emergency rescue teams should reach the scale of 10,000 or even tens of thousands of people. The gradual training model in the past has been unable to meet the huge demand for talents in the field of emergency rescue in the future" [2]. In China, big data technology and emergency management started relatively late, the total amount of big data talents is less, and the big data talents in the field of emergency management from the government are scarce.

### B. The quality of big data talents is poor

When the public crisis occurs, the big data talents of the government emergency management should be able to respond to the unstable state timely and effectively. However, at present, in the field of emergency management, the Chinese government lacks leading talents, technical talents and public relations talents who are proficient in big data.

(1) The ability of leading talents is insufficient. When the public crisis happens, the leadership and command of emergency management is generally in charge of the head of the government department. A competent leader in emergency management needs to scientifically predict and identify public crises beforehand, quickly coordinate and deal with public crisis events, and cope with the aftermath and recover effectively. Nevertheless, the leaders of government's emergency management are weak in early warning and identification. The leading talents couldn't effectively capture relevant data that can predict public crisis events. Their abilities of mobilization and organization are poor, and they can't coordinate different rescue forces efficiently. In the process of rehabilitation, these talents prefer material reconstruction to summary of the process of public crisis events, reflection of causes, and evaluation of disposal effects.

(2) The ability of technical talents is weak. Big data mainly includes five types. First, Web and social media data, such as Facebook posts, web content, etc. Second, machine-to-machine data, for example, RFID readings, GPS signals. Third, large amount transaction data, such as telecom call details. Fourth, biometric data, like face recognition, genetics, etc. Fifth, artificially generated data which come from call center voice recording, e-mail, etc. [3]. The Chinese government isn't short of data, but lacks technical talents for researching and managing data.

Faced with various growing data, some people in the department of emergency management from government often ignore the data that may be related to public crisis events. Some of the staff only pay attention to one type of data but turn a blind eye to other types of data. There are still some shortcomings in the data collection, data mining, data cleaning, data analysis, etc. The value of big data needs to be developed.

(3) Public relations talents lack correlative abilities. When public crisis events occurs, many government departments are unable to publish a variety of information related to crisis events in a timely, transparent and accurate way, and they are not good at dealing with media scientifically. It leads to public suspicion, negative news and various speculations from time to time. When some government departments hold a press conference on public crisis events, the staff evade the important questions for the easy, or cover up some information, or hastily wind up a matter. These kinds of behavior aggravate the media and the public's suspicion. These phenomena reflect the government personnel's public relation ability in emergency management is poor. Sometimes, the media is referred to as "the fourth power" which shows its great influence. In the emergency management, if there are some professional public relations practitioners in the government to collect data from various sources, analyze the social mentality, and correctly guide the media and the public, it can help to deal with crisis events. On the contrary, public crisis events may be misled by negative public opinion, which is adverse to or even deteriorate the disposition of public crisis.

### III. REASONS FOR THE LACK OF BIG DATA TALENTS IN THE EMERGENCY MANAGEMENT FIELD OF THE CHINESE GOVERNMENT

There are many reasons why the Chinese government lacks big data talents in the field of emergency management, but the main reasons are concentrated in the following three aspects.

#### A. Staff's awareness of big data is weak

In recent years, the government's awareness of big data has been greatly improved, and some documents have been introduced to guide the development of big data. However, compared with the actual needs, the awareness of government's big data in emergency management still has a big gap. The thinking of traditional emergency management mainly focuses on the political thinking of "stress politics" and "bear the overall situation in mind", the regular causal thinking, the compulsory administrative thinking, the secret monopoly thinking, and the staged cycle thinking [4]. Therefore, the Chinese government leaders and grassroots staff are still accustomed to the working model of uploading and issuing, lack of big data awareness, and have not recognized the great value of applying big data. Government personnel tend to focus on their own experience and intuition in emergency management rather than scientific data. The big data department established by the government often becomes a kind of furnishings or stunt. Many other departments do not share and integrate their internal data in the big data department, but as a "private item" of itself. It leads to the closure among various departments and forms a "digital divide" that makes it difficult to use these data effectively. In the era of big data, the relation of data is correlative, no longer a traditional causality. Nevertheless, most staff are inclined to causal analysis in emergency management. Because of the lack of big data idea, the government has a large amount of data but cannot give full play to the role of big data in emergency management.

#### B. Lack of specialized laws

As an emerging thing, big data has yet to be regulated and guided by the law. Regarding the legal provisions on big data, China has introduced the "Network Security Law". Other provisions are scattered in the statutes of the Criminal Law and the Anti-Unfair Competition Law. "The main reason why the legal protection of big data has become a concerned topic in the field of law is that China has not yet introduced special laws and regulations to protect the legitimate use of big data. [5]" While people pay attention to the value of big data, anxieties about the adverse consequences of big data may come into being. Everyone's behaviors and habits in life or on the Internet can be recorded. These data of individual behaviors which are seemingly disorganized are collected together, then they will show the individual's behavioral regularity and become valuable information when they reach a certain number. If someone has an ulterior motive for the information, the consequences are hard to predict. "In theory, no matter whether individuals, social organizations, or countries are no place to hide in the Internet Era. Things like personal privacy, trade secrets, and state secrets can be

obtained by using big data technology, so information security faces unprecedented threats.”[6]. In order to normalize the development of big data, it is particularly vital to enact specialized laws.

#### C. The training mechanism for big data talents is unreasonable

In the final analysis, the development of emergency management in the era of big data relies on the development of big data talents. However, the Chinese government does not have a scientific mechanism for the training of big data talents, which leads to a slow growth in the number of big data talents in the field of emergency management, and it is difficult to improve the quality of talents rapidly. The cultivation of big data talents in the field of emergency management stays in the traditional mode. The government has not established a multi-level and multi-type talent training system for big data talents, and the efficiency of talent fostering is low. China has not established an overall plan about big data talents. There is a lack of talent reserve about big data in the field of emergency management. Emergency management in the era of big data requires knowledge from different discipline backgrounds. However, the talents in the field of emergency management in the Chinese government often have a single background of knowledge and are short of interdisciplinary and integrated talents who are proficient in big data. In the government's emergency management, most of the staff usually improve their abilities of big data through internal training or self-learning. The government rarely cultivates talents with universities and enterprises, and does not rely on the big data resources of universities and enterprises. The current pattern of introducing big data talents is mainly civil servant examinations. It has a small number of recruits and a long period, so it is almost impossible to effectively solve the present shortage of big data talents.

### IV. PATHS OF TALENT TRAINING IN THE FIELD OF EMERGENCY MANAGEMENT

Although the current situation of government's big data talents in the field of emergency management is not optimistic, as long as the government adopts the problem - oriented strategy shoots the arrow at the target, and improves from the following paths, China will cultivate more excellent big data talents and enhance the capability of emergency management.

#### A. The government should strengthen the staff's awareness of big data

The big data talents in the government's emergency management should strengthen their awareness of big data and thus improve their own big data technology. In the era of big data, the government's staff need to establish an awareness of relevance, think highly of the correlation between different data, and explore the value behind the data. The government must also have the awareness of open and sharing. Different departments work together in an open mind, cooperate closely with each other, share data, and break the “information island” effect. The leader of emergency management can take the overall situation into consideration through mastering the multi-faceted data of public crisis events, make decisive

decisions by relying on big data and other information means, dispose the crisis events timely, coordinate resources quickly, and prevent the expansion of the events. The technical talents of emergency management should collect and arrange information on various crisis events in daily work, monitor and track them, then take timely measures to enhance the handling and rehabilitating capabilities of emergency management. By promoting the awareness of big data, public relations talents of emergency management use big data technology to cope with the public crisis events effectively. They also come into contact with the mainstream media efficiently, pay attention to the post bar, forum, WeChat group, QQ group and other platforms on the network, as well as the public opinion in life. Analyzing related content through big data, public relations talents can accurately understand social mentality, purge the “noise”, eliminate public concerns, and win the understanding, trust and support from the society. The government transforms passivity into initiative in resolving public crises.

#### B. The government enacts specialized laws to regulate the development of big data

After the Third Plenary Session of the 18th CPC Central Committee, “the rule of law” has guided the development and construction of various fields, and the application of big data in emergency management is no exception. The government must formulate specialized laws to regulate the collection, organization, storage, application and other links of big data. Relevant laws need to stipulate the responsibility of different units and their personnel in the collection and other things of big data about public crisis events. They should cooperate actively with the big data talents' work. In the department of emergency management, the big data talents usually pay attention to data analysis and data mining to obtain accurate and valuable information. The talents should integrate these data into a database with a unified standard, then share them among different departments and regions. The government will also introduce laws that restrict the behavior of big data talents, so that every talent could be responsible for their words and deeds. The laws enacted must protect the privacy behind big data and prevent big data talents from invading the privacy of citizens or corporations. For those people who use big data to endanger social stability, implement power rent-seeking, or damage national security, the relevant departments must be held responsible legally, and those who constitute criminal offences must be investigated for criminal responsibility. The government should also avoid over-reliance on big data. Distorted data is difficult to monitor and deal with, and the losses may be more serious, which is not conducive to emergency management.

#### C. The government needs to innovate the training mechanism for big data talents

“Even if the emergency management plan is perfected, it is inseparable from the subjective initiative and execution ability in the emergency response. Training is a fast and effective way to improve this ability. [7] Therefore, the government should pay attention to training big data talents in the field of emergency management, and then strengthening the breadth and depth of learning knowledge, because good

reserve of knowledge is a necessary condition for emergency management talents to improve emergency management capabilities. The knowledge dimension of emergency management professionals includes laws and regulations related emergency management, professional knowledge, psychological knowledge and emergency disposal methods and procedures, and so on [8]. The training of big data talents in emergency management should be drawn up a scientific overall plan based on these knowledge, and divided into various stages reasonably, and then organized and targeted trainings are carried out. The focus of training is the learning of theoretical knowledge and improvement of application ability about big data and emergency management. The government should establish a multi-level, three-dimensional training system for big data talents, make full use of existing resources from enterprises, universities and society, encourage enterprises and society to engage in big data research, open majors or offer courses such as big data at university, and absorb college graduates in the major like information management and e-commerce to enrich the talent team in the domain of government emergency management. Big data talents need to build a learning mechanism. In the workday, they should understand the common sense of emergency management, study the knowledge of emergency management, be familiar with emergency response plans for various public crisis events, master crisis management methods, and improve rescue capabilities. The government has to reform the talent policy, increase investment in funds and other aspects, create a good atmosphere and environment for the competition and development of big data talents. It is also necessary to innovate the evaluation system for big data talents, and incorporate the capabilities of big data technology into the assessment content. For the sake of encouraging big data talents, the government introduces new mechanisms in the aspects such as salary and promotion. The government ought to reform the talent introduction mechanism to attract more big data talents to enter the government emergency management, thereby enriching and improving the overall strength of the big data talent team. In order to promote the training of big data talents better and faster, the government needs to establish a mechanism of talent exchange, strengthen personnel cooperation and communications between different departments, share resources, and improve the level and ability of emergency management.

## V. CONCLUSION

After human society entering the era of big data, big data talents are of great significance for emergency management. Cultivating big data talents through scientific paths, the government has to strengthen all aspects of the cultivating big data talents, raise the government's awareness of big data,

legislate specialized laws to regulate the development of big data, and innovate the personnel training mechanism. China will build a high-quality talent team in the field of emergency management. By means of big data technology, big data talents enhance the awareness of emergency management, reinforce the capabilities of emergency management, checkout the mechanisms in emergency management, perfect the emergency management systems, cooperate closely with other departments, provide intellectual support for emergency management, respond to public crisis events effectively, and make society more stable and orderly.

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