

Big data: Application, potential problem, and prospect

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Abstract. In recent years, big data has gradually become a hot topic; its appearance makes people full of infinite reverie about future life. Big data, is not just a theory but has gradually begun to affect all aspects of people's lives. Many previous articles focused on the analysis principle and operation mechanism of big data and did not cover the practical application of big data too much. The specific application of big data is still a mystery to people. This paper uses literature analysis to describe the application, potential problems, and prospects of big data. This paper finds that big data, on the one hand, has appeared in all aspects of people's daily lives, which greatly facilitates people's lives, on the other hand, it also hides some problems. But risks always coexist with opportunities, if people can seize opportunities and control risks, big data will make a huge difference in people's lives.

Keywords: big data, healthy care, smart city, privacy and security.

1. Introduction

The 21st century is the age of information, and with the widespread use of the Internet, mankind has entered the information age. In this era, people face an enormous amount of information every day, and this information is stored as data in datasets. The term Big Data is used to describe digital information which is enormous, heterogeneous, unstructured, and hard to use traditional analytics to manage [1]. In the beginning, there are three words used to describe the main features of Big Data: volume, variety, and velocity (3V model) [2]. In recent research, researchers gave an extension to the 3V model, and there are two new features: value, and veracity [1].

Based on the 5V model the research of Big Data has a rapid development, most papers elaborate the analytics and algorithm of Big Data. The main purpose of this paper is to provide some basic idea of the application, potential problem, and prospect of big data Analytics. The section on application describes the application of Big Data Analytics in healthcare and smart city. The section on potential problems discusses the problems and hidden dangers of big data in privacy security. The last section focuses on the prospect of Big Data in the market and social public management. This article provides an initial introduction to big data so that readers can have a brief understanding of some of the concepts and applications of big data foundations.

2. Application of big data

The term big data has begun to be gradually known, but people's impression of it is still at the theoretical level, knowing that it is a kind of data, containing various information in people's daily lives, but the

specific application of big data and the impact on life is still unknown. This section will introduce the application of big data in health care and smart city.

2.1. Big data in health care

Because big data analysis tools and special changes are good at in-depth analysis and sorting of large amounts of data, based on electronic medicine and health records, big data analysis can often give predictive models, so that traditional medical information and modern social health are linked, so that doctors will have a deeper understanding of variety of diseases that were difficult to detect before.

The first important application in health care is the Electronic Health Record (EHR). EHR is patients' data including medical imaging, socio-behavioral, and environmental data over the next few years [3]. It is because EHR records the patient's medical data, so that medical workers can easily understand the patient's past clinical treatment records, medication records, and physical examination reports, Based on these data doctors can formulate a more suitable treatment plan for the patient, prescribe the right medicine, greatly improve the efficiency and accuracy of treatment, and medical resources have been better allocated. In the past, it was difficult to do this because most clinical data did not provide useful medical information because it was difficult to collect long-term medical data from patients. In today's medical data platform, the medical community collects, integrates, and establishes appropriate decision-making models for patients, so that medical staff can make medical orders that are more suitable for patients [4]. At the same time, EHR also greatly reduces the burden on patients, they do not need to go for various medical examination before clinical treatment, because their medical data has been recorded in the database, and only need to be examined according to the requirements of doctors. Big data has greatly improved medical efficiency, allowing doctors to better understand patients, and allowing patients to receive more professional treatment.

In addition, big data also plays a role in the biomedical field. The cell is a biological system, that plays an important role in the human body, and is the most basic unit of living things, and some series of human body behaviors are closely related to them. Biomedicine is to study the molecular movement and interaction between cells, which requires a large amount of experimental data to explain a given phenomenon [3]. A large amount of data can be provided, and this large amount of data can reveal information that in the past could not be discovered or unidentified due to insufficient sample size. Hence, biomedicine has entered the '-omics' era. The discipline of "omics" has made significant progress, as scientists can now study the entire "genome" of an object in the study of "genomics" in each amount of time, rather than studying individual "genes" [3-4]. Like genomics, proteomics and metabolomics have also developed greatly. For example, the database contained in big data provides a large amount of experimental metabolite concentration data, and this data provides a lot of information for clinical practice. It can be said that the emergence of big data has provided rich soil for biomedical research and made more ideas possible.

2.2. Big data in smart city

There is currently no unified definition of the concept of smart city because everyone has heard of smart city, but the understanding of its deep connotation varies from person to person [5]. However, there is a consensus on the main characteristics of smart cities. A smart city is a comprehensive city built on data, through information to plan and manage the city's transportation, electricity, buildings, constitute a unified, efficient, and harmonious community.

One of the biggest advantages of big data is the huge database, and based on these databases, resources can be allocated more reasonably. In modern society, the rational use of resources is the common goal of all people, and big data can analyze the stored information, establish efficient and accurate models, and make the allocation of resources more reasonable. And through big data for resource allocation, avoid the embezzlement and waste caused by traditional methods. The electronic monitoring of big data makes the coming and going of resources traceable, which undoubtedly improves the transparency of urban administration. At the same time, big data builds models according to people's

needs and provides people with more professional and reasonable services and suggestions, which will greatly improve people's quality of life.

For instance, the emergence of intelligent traffic lights will provide great convenience for urban transportation. As the population grows, cities must expand to accommodate more people, which makes the roads in the city more and more complex, and the large population and complex road conditions make traffic jams often occur. This often makes it difficult for vehicles to travel at some intersections, while others are very empty. The intelligent traffic light is networked with the big data information database, monitoring the road conditions in real-time, controlling the traffic lights according to the road conditions, and controlling the speed, quantity, and density of traffic flow by changing the signal lights [5]. This allows empty roads to be used and congested roads to be released.

A further example is the application of smart grids. Electricity can be said to be the 'blood' of a city, and the power grid is to deliver this blood to all corners of the city. Big data can model supply and demand by analyzing the generation and consumption of electricity, thereby controlling the production and distribution of electricity in power stations [5-6]. For example, it can increase power generation during peak periods to avoid blackouts and reduce power generation during low valleys to avoid waste. This undoubtedly improves the utilization of resources and reduces waste, so smart cities are also sustainable cities.

3. Potential problems of big data

While the development of science and technology brings convenience to people, it inevitably brings a series of problems. The application of big data improves people's quality of life and facilitates people's lives, but it also contains great hidden dangers. This section will discuss the potential issues posed by big data, such as security and privacy, and bias of big data algorithms.

3.1. Security and privacy

As mentioned above, the twenty-first century is the age of information, and the security and privacy of people's information is undoubtedly a top priority. People's medical information, private business activities, and travel routes are all collected and stored in databases by big data. As mentioned earlier, this data facilitates people's lives, but it puts a person's privacy at risk at any time [7]. This information can be used illegally, such as sold to third-party companies, resulting in privacy leaks that provide fertile ground for violations of crime, such as telecommunications fraud and financial fraud. This harm is not only economic, as once people's residential addresses are leaked, they will be targeted by criminals on the Internet, and may even endanger personal safety.

3.2. Bias of big data analytics

All the behavior of big data is based on the research and analysis of data, but data also has classification, some data is accurate and objective, but some data is full of bias or even wrong. The data in the database on which big data relies records human behavior, and the information generated by humans cannot be completely objective and contains a large amount of biased information. A large amount of data input does not make the model established by big data more objective but makes the model full of human bias culture, such as gender discrimination, racial discrimination, and class discrimination [8]. Wrong information input can only get wrong results, how to identify spam information, is a challenge to face in the development of big data.

4. Prospect of big data

Although there are potential dangers, opportunities always coexist with crises, and the prospect of big data is still broad. This section mainly focuses on the possibilities of big data in market decisions and government management.

4.1. Big data in market

People's preferences are hidden in messages, and messages people leave on social media, such as Facebook, Twitter, reveal their preferences and emotions [9]. This information is valuable to market decisions, providing data that allows the market to better understand consumer preferences and thus provide more consumer-friendly goods. Advertisers can also push advertisements to the corresponding groups of people who are interested in it to achieve the purpose of accurate delivery. In the past, due to the blockage of information, consumers could not find their satisfactory commodities, and producers could not find suitable consumers, but now big data can directly connect consumers and producers, which will greatly promote the activity of the market.

4.2. Big data in social management

Big data can also play a huge role in the public management of governments. The government can establish a government-specific database and build models through the database, for example, the government can analyze the income information of residents in a certain area to issue more appropriate economic policies [9]. The database established by the government department can free the staff from the repetitive and tedious work of the past, and the efficiency of the government will be greatly improved.

5. Conclusion

This paper analyzes the applications, potential problems and prospects of big data, providing a basic perspective on big data. Big data technology has appeared in all aspects of people's daily lives, and it has gradually changed the way people live. It helps people get more efficient and professional medical treatment, reduces the burden of patients, and broadens the field of future biomedicine, providing more possibilities for the development and clinical treatment of future biomedicine. In terms of urban planning, big data can make full use of resources through reasonable allocation, eliminating waste. The macro-control of the city has also improved people's quality of life, and at the same time made the management of the city more transparent. Big data also inevitably brings a series of problems, such as the privacy and security of information, algorithm discrimination and so on. For privacy and security, this requires the intervention and supervision of government departments to standardize the use of big data and reduce corresponding crimes. For algorithm discrimination, further development of technology is required to update the algorithm to eliminate spam. The promise of big data is equally promising, stimulating the market by integrating information to connect consumers and producers in market decisions. The participation of big data allows governments to enact more suitable policies. With the development of big data, opportunities and crises coexist, and the future will be full of infinite possibilities. This paper also has some shortcomings, such as the lack of detailed explanation and description of the concept of big data, and the operation of big data is not explained, which is also a direction for future authors to improve.

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