

## Chapter 92

# The Contemporary Ethical and Privacy Issues of Smart Medical Fields

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### ABSTRACT

*With the development of big data technology, such as data mining and data matching, many industries have started a revolution, including medical field. Big data not only strengthens the accuracy of medical diagnosis, but it also enhances the efficiency of the entire medical system and relevant medical staff. Additionally, with the rethinking of innovation, the application of wearable intelligent device, RFID technology and sensor technology play positive roles in promoting medical interaction between hospital system and wearer. Smart medical provides effective methods for individual health management and promotes the progress of medical information. However, there are also some inevitable ethical problems, e.g., the leakage of privacy information, which cannot be avoided to some extents. The authors recommend some suggestions to reduce the possibilities of ethical problems happened during the data flow process.*

### 1. INTRODUCTION

With the rapid growth of the network and technology in recent years, the speed and quantity of digital data have been produced increasingly and rapidly. So far, all industries are actively involved in big data applications, and the smart healthcare industry has no exception. Big data has the potential to offer

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more health services for individuals and populations, since it can be more cost-effective for healthcare operations and can lead to new treatments for chronic and infectious diseases. Big data has brought a great impact on the development of the traditional medical industry, from the traditional paper records to electronic health records, to improve the efficiency and accuracy of the medical treatments. The popularity of wearable devices and smart home care systems has not only improved the emergency response of healthcare systems, but it has also raised awareness on health monitoring. The widespread use of RFID technology and sensor technology can enhance the quality and safety of pharmaceuticals and medical devices. However, due to the large and complex data in the field of medical industry, big data has greatly challenged the development of the medical industry. At the same time, it has posed great challenges to technology, social system and informal system such as ethics. Based on the existing research, this article summarizes the issues of morality, ethics and privacy in the field of smart medicine under the influence of big data and puts forward some suggestions.

## **2. LITERATURE REVIEW**

As the “new oil” in the 21st century, big data has become a hot topic in all walks of life. People have realized that big data can offer great opportunities in various fields such as commerce, healthcare and government. However, there are different versions of big data definitions. Big data can be defined as “relative terms” (Minelli et al., 2013) to describe the rapid development of computer technology and the dramatic increase in data volume (Albrecht & Fangerau, 2015). In the dialectical way of thinking, the definition of big data has four main aspects: a) Some scholars focus on the attributes of data, including the size, speed and diversity of data in order to highlight the novelty of big data (Laney, 2001). b) Other scholars focus their attention on the entire process, focusing on the collection, management and use of data. That is, data found through data processing (Boyd & Crawford, 2011). c) Of course, some scholars have also focused their attention on big data, especially on exploring the limitations of big data. In particular, Boyd and Crawford (2011) consider big data to describe the ability of businesses or individuals to collect, organize and use large databases. d) On the basis of the first three points of perception, some scholars have focused their attention on the socio-economic, cultural and political conditions underlying the phenomenon of big data (Ekbja et al., 2015). IBM does not define in that particular way, but rather in terms of quantity, breed, speed, and accuracy (IBM, 2017).

Although there is no unified definition of big data presently, it has been widely used in the modern society and has provided massive opportunities for the development in all fields. Therefore, many problems have emerged in the introduction of new technologies in different sectors. In particular, in addition to the various laws, regulations and policies, emerging issues such as ethics should be carefully evaluated, since it has direct impacts on the society and people. The issues of ethics and big data depend largely on how we define ethics (Herschel & Miori, 2017). In fact, the study of ethical issues began 2400 years ago, since there were mainly four kinds of views: Kant’s ethics, Bentham and Mill’s utilitarianism, Rousseau and Locke’s social contract theory, Dodd and Plato’s moral ethics (Herschel & Miori, 2017). Using these four theories to explain big data, Kant’s theory describes that everyone should follow a rule or a code of ethics that states that everyone’s information can or cannot be shared is obviously impossible, and Kant’s Theory is only suitable as a moral basis for big data analysis (Kantian ethics, 2016). Utilitarianism shows that assessing the ethics of big data from a practical point of view is complicated because it requires the quantifying the consequences of using big data and its services. In other words,

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