

## Chapter 73

# Impact of Privacy Issues on Successful Implementation of Personalized Medicare System: An Empirical Study

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### **ABSTRACT**

*Personalized medicare systems is an emerging field of research, which bears the potential to significantly reduce healthcare expenditures and treatment errors and thereby to revolutionize the entire treatment procedure. In this novel approach, genomic variation in different individuals is duly taken into consideration. However, there exist several serious issues (e.g. privacy concerns) that provide hindrance to large-scale adoption of this medicare system. The main objective of this study has been to identify the privacy issues and to evaluate their impact on successful implementation of this novel medical treatment. The methodology used is empirical and is based on a survey-based post facto procedure. The data collected from the survey are analyzed by using the method of structural modelling analysis. This is an original study in the realm of healthcare management, which reveals that the technology related factors and privacy concerns have considerable impact on the successful implementation of personalized medicare system on a large scale. But the privacy concerns have no significant moderating effect on the impact of technology related factors, so far, the success of implementation of personalized medicine is concerned.*

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## **1. INTRODUCTION**

The need for personalized healthcare (PHC) is realized from the fact that each individual is unique and so is each disease. This is why the treatment of a diseased person should be based on his genetic characteristics rather than the type of disease that the person is suffering from. This is supported by the observation of the clinicians that the same medicine does not work for all patients suffering from a particular disease. This observation suggests that medical diagnosis should start from a molecular level and that detailed genetic information of the patient be made available to the clinician before prescribing the medicines. It is further suggested that since there can be several causes for the onset of particular diseases, the population of patients suffering from that disease can be subdivided into different groups, on the basis of their genomic characteristics. It is hoped that in the current age of digital technology, personalized healthcare will enable physicians to tailor medical treatment according to the requirement of individual patients. The latest developments of molecular biology coupled with modern diagnostic procedures bear the potential to elevate the personalized healthcare system to a new paradigm.

Electronic medical records (EMR) are very useful in treating patients in the personalized healthcare system, because by using EMR, a clinician is able to track data of particular patients over time and to monitor different parameters, such as blood pressure and cardiac conditions, etc. Due to this reason, the overall quality of medical care can be greatly improved. Electronic health records (EHR), provide a more comprehensive history of a patient, than EMR. The advantage of EHRs in contrast to EMRs is that the patient can carry his records, when he/she is moved to any other hospital/nursing home, or when he/she wants to visit specialists for consultation.

Since EMRs of patients are accessible to multiple authorized persons, maintaining the confidentiality and privacy of information regarding a patient's healthcare data is a very difficult task. If the personal information of a patient is disclosed to others, it may be harmful to the patient due to psychological, economic and social factors. So, it is very essential to safeguard the confidentiality of a patient's healthcare data. However, according to Barrows Jr. and Clayton (1996), if adequate safeguard is adopted, electronic medical records may be made more secured than the conventional paper-record system.

Miller and Tucker (2017) dwelt on some issues related to protection of privacy in genetic testing and personalized medicine. These authors made an important observation that privacy is the key issue that should be paid adequate attention in the development of personalized medicine and genetic information systems. In the case of electronic medical records, the need for privacy protection and technology diffusion was discussed by Miller and Tucker (2009). Healthcare monitoring systems architectures were discussed in detail by Manirabona et al. (2017).

The discussion made above emphasizes the need for investigating the impact of privacy issues on personalized healthcare systems. In view of this, here we have undertaken an empirical study to explore the same, with an aim to brighten the prospect of personalized healthcare.

Rest of paper is organized in the following manner Section 2 discusses the theoretical background, which includes a brief review of exciting literatures on the topic. 'Success' measures in the context of adoption of personalized medicine are discussed in Section 3, while Section 4 presents a discussion on technology related success factors. Section 5 gives an elaborate discussion on various privacy issues, which play key roles in the success of implementation of personalized healthcare. The criteria for the preparation of the survey questionnaire and the method of data collection, used in the empirical study are mentioned in Section 6, while the details of data analysis are presented in Section 7. An elaborate

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