HEALTH POLICY
AND TECHNOLOGY

VIEWPOINT PAPER

Is the adoption of electronic health record system "contagious"?

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Abstract
The adoption of Electronic Health Record (EHR) system is complicated. Based on extensive literature review and drawing upon two theories—social contagion theory and task technology fit theory—I argue that the adoption of EHR system is contagious among health care providers; however, the contagion effect depends on the fit between the characteristics of EHR system and the characteristics of health care providers. The statistical analysis on the responses from practitioners in various health care providers supports my argument.
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Introduction

Electronic Health Record (EHR) system is an emerging health information system and has received increasing attentions in the U.S. over recent years. Many studies found that EHR systems have clear benefits for the U.S. healthcare sector. For example, EHR system is regarded as "the foundation for a safer and more efficient healthcare system" [1], and is capable of providing timely and accurate clinical information for a better decision making [2]. However, adopting new information systems such as EHR systems in the U.S. healthcare sector has proven difficult. Historically, the U.S. healthcare sector has lagged behind other sectors in the adoption and use of IT [3], e.g., financial services, insurance, etc.

For instance, only 17% U.S. physician offices and 10% hospitals have adopted EHR systems in 2009 [4].

This gap between the expected benefits of EHR systems and the slow and low rate of adoption presents a good opportunity for researchers to understand how EHR systems are adopted in the U.S. Prior studies mainly focused on EHR system itself [5,6] but paid less attention to the institutions that adopted/would adopt it. As an emerging HIT, EHR systems have both benefits and risks; there have been instances that adoption of HITs failed. Some institutions choose to be the "followers" rather than "leader" in adopting new HITs. In this sense, the adoption of EHR systems in some institutions would affect other institutions' adoption decisions and therefore, is "contagious". However, "blindly" following others without considering its own characteristics would also be problematic. This paper strives to tackle these two problems by looking into both the characteristics of EHR systems and of the institutions that adopt them, and the interactions between these institutions,

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from two theoretical perspectives: task-technology fit (TTF) theory and social contagion theory. TTF theory is useful in explaining how technology interacts with tasks or activities of an organization and impacts its performance [7]. Fichman (2004) called for research that links IT and its impact on organization performance in explaining the adoption of ITs. On the other hand, in the context of EHR system adoption, physician resistance has been extensively discussed in the literature as an important barrier to EHR system adoption [8-10]. However, physician resistance would be mitigated by the influences from other physicians who have adopted HIT [11]. Social contagion theory, which depicts how ideas or opinions spread in a social network [12-14], can be used to explain the influences from other physicians or other healthcare institutions.

This paper proceeds as follows. In the next section, the related literature was reviewed and hypotheses and research model were developed. Methodology and results of data analysis were then presented. In the end, the results and conclusions were provided.

Literature review

Task technology fit theory and EHR system

EHR system is "the software platform that physician offices and hospitals use to create, store, update, and maintain EHRs for patients" [1], and is an emerging HIT, which received great attention over recent years. Although EHR systems have common features and components, the implementations in different institutions vary. Therefore, it is necessary to evaluate whether a certain package of EHR system meets the requirements of a certain institution. Theoretically, TTF theory provides guidelines for institutions to evaluate technologies. TTF theory postulates that when a technology has features that fit the requirement of a task, performance of the organization will be improved [7,15]. TTF has been used to explain the adoption of various technologies including group decision support system [16], high-speed data services [17], technology-mediated distance education [18], mobile commerce [19], mobile banking [20], and mobile location systems [21], to name a few.

The adoption of an IT may be explained by the intention of the organization to improve organizational performance [22]. Performance is one of the most important underlying driving forces of the adoption of ITs. TTF focuses on the fit between IT and the requirements of the tasks and how the fit impacts performance, while other theories have different focuses. In the context of EHR, the research on how EHR can be used and potentially improve the performance of healthcare providers is called for. TTF looks at the features of a technology, and additionally, how these features fit or meet the requirements of a task or tasks to achieve the organizational goal. Therefore, TTF is in a good position to explain the adoption of EHR system.

Social contagion theory and EHR system

Many studies suggest that resistance from current physicians and staff in the healthcare provider institutions is one of the major barriers in adopting new HIT [23], while the administrators and IT professionals in the healthcare provider institutions, on the other hand, often advocate the adoption of ITs. Clinical professionals argue that they care more about treating patients, saving lives, rather than using new ITs, which may disrupt their daily activities. However, influences from other physicians could mitigate the resistance from current physicians. It is more interesting in knowing how other physicians' adoption decisions influence the focal provider. Social contagion theory provides an answer to this question. Social contagion theory has long been used in the research of diffusion of innovations [12-14]. Social contagion is analogous to the spread of epidemic diseases. Simply speaking, different person has different immunity to the disease, and different disease carrier has different ability to infect others. The closer a person is to the disease carrier, the more likely he or she will be infected. Using the terminology of social contagion theory, organizations are different in susceptibility, which refers to the propensity to accept others' ideas or opinions. Organizations also are different in infectiousness, which refers to the ability to influence others. For example, an organization, which has a high reputation, is more influential than less reputable ones [24]. The influence from others also depends on the physical and social proximity. Physical proximity refers to the distance between the focal organization and other organizations. Social proximity refers to the social relationship between the focal organization and other organizations. For example, a hospital has a closer relationship with another hospital in the same hospital network than a third hospital that is outside of the hospital network.

Social contagion theory holds that an actor's behavior is a function of its exposure to others' behavior [13]. The social contagion is determined by the focal provider's susceptibility, its proximity to other providers, and the infectiousness of other providers. Moreover, social contagion theory has been used to examine the adoption of EHR [12]. The organization's likelihood of adopting EHR is found to be "a function of its susceptibility to the influence of prior adopters, its proximity to prior adopters, and the infectiousness or potency of influence exerted by adopting [organizations]" (p. 1220). However, Angst et al. (2010) only revealed the dynamic social contagion process without considering other potential forces driving the adoption of EHR. The combination of social contagion theory and TTF will complement to their study and provide a more complete understanding toward EHR adoption. Although social contagion theory provides explanations toward how organizations are influenced by other organizations' behavior, it is hard to believe that an organization makes the decision mainly based on others' behavior; rather, it gives more weights on its own analysis on how the IT can improve its performance.

Hypotheses development

As discussed in the previous section, EHR systems vary in different healthcare provider institutions. Different institutions may have different requirements on a certain EHR system. Ultimately, the purpose of adopting EHR system would be to improve the performance of the institution. Therefore, the adoption of EHR may be explained by the intention of the healthcare organization to improve organizational performance through the fit between its clinical or