

Mobile Health (mHealth)

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INTRODUCTION

Individuals have become attached to smartphones as they provide much needed functionality. Patients and their family have started using smartphones for many purposes such as searching health information, discussing healthcare matters with colleagues or friends, and seeking opinion of online healthcare services. In fact, smartphones and tablet computers are increasingly important instruments in the toolkit of public health professionals and researchers (Ritterband et al., 2006). The main advantage of smartphones is the ability to connect to the Internet anywhere-anytime, allowing people to work without physical and time boundaries. This allows them to remain continuously connected and in touch with their social networks (Weal, 2011). Mobile health (mHealth) can help improve health services as services can be conveniently accessed anywhere-anytime. According to Eysenbach (2011), mHealth health services (including treatment of patients) can be delivered through the mobile devices.

Most healthcare initiatives perceive patients as recipients of health/medical care, where they play little roles in the process of health decision making. For example, it is difficult for a patient to get access to his/her own health record to find out his/her health history. On the other hand, the advancement of mobile technology, which is adopted by many organizations, has given customers a greater role in taking part in the business process including the ability to gain access and control of information flow that fits with their personalized needs.

In addition, the wide adoption of smartphones and the emerging of their usage in healthcare raises the possibility to engage patients, patients' families, and society at large to actively participate in their own healthcare process. For instance, social networking which is accessible through smartphones can provide

an avenue to identify misuse or misunderstanding of antibiotics, share health information, promote positive behavior change, disseminate valid information, and explore how such tools can be used to gather real-time health data (Scanfeld et al., 2010). mHealth can offer healthcare providers the ability to broaden their services beyond its usual practices, and thus provide an environment in achieving complex healthcare goal(s) such as building lasting relationships with their patients. A good relationship between a healthcare provider and its patients is believed to improve customers' satisfaction, which in turn makes them loyal customers (Richard and Ronald, 2008).

The main goal of this article is to introduce a promising research direction, which may shape the future path of health services delivery through mHealth. We propose an mHealth model that extends the role of customers (patients) into three dimensions: as an individual health actor (mPersonal), social health agent (mSocial), and medical care partner for healthcare providers (mMedical). The model is designed to establish long-term relationships between patients and their healthcare providers, improve customer satisfaction, and raise health literacy of individuals and community at large.

BACKGROUND

The use of smartphones with the Internet connection has permeated almost all aspects of our life, including healthcare. Presently, almost every healthcare organization depends on information and communication technology (ICT) in almost every level of their activities. One of the most valued aspects of ICT is its capability to enhance an existing human process or function to improve consistency, accuracy, and efficiency. Similarly, efficient and effective healthcare services

DOI: 10.4018/978-1-4666-5888-2.ch553

have become increasingly dependent on accurate and detailed clinical information, which are transferred from interrelated departments or even between organizations (Conrick, 2006).

Nowadays, with the rapid adoption of smartphones, the space, time and distance barriers for customers, including the customers of the healthcare industry, to access information is reduced, to almost nothing. In fact, smartphones facilitate the use of dynamic web and application namely Web 2.0 that allows intensive and immediate interactivity through social networks. In Web 2.0, customers can collectively contribute contents and applications (O'Reilly, 2005). Web 2.0 is defined as a set of economic, social, and technology trend that collectively form the basis for the next generation of the Internet – a distinctive medium characterized by users' participation in using networks such as *Facebook*, *Twitter*, *Myspace*, *Friendster* and *LinkedIn*, which have indeed grown rapidly, facilitate peer-to-peer collaborations, ease of participation and ease of networking. The term social networks refer to the use of Web 2.0 that describes the social characteristics that supports the promotion collaborative sharing. Web 2.0 is commonly associated with technologies such as weblogs (blogs), social bookmarking, wikis, podcasts, Really Simple Syndication (RSS) feeds (and other forms of many-to-many publishing), social software, and Web application programming interfaces (APIs) (Kristaly et al., 2008). Web-oriented applications and services use the Internet as a platform to provide unique features by engaging and providing users with rich interactive experiences (Rodrigues & Vaidya, 2010).

The wide acceptance of the Web 2.0 services will affect the operation of future businesses. Greenberg (2009) explained these changes and that the customer's ownership of the conversation ultimately leads to organizations readjusting their business strategy. The fast adoption of smartphones has made customers or patients demand health services accessible through their smartphones. Health service providers have to respond these demands properly to sustain their business. In fact, health service providers can provide services that can take advantage of features of smartphones or other mobile devices such as Web 2.0 features.

Customers' demands have changed because they have been empowered by the vast amount of information available to them (Anshari et al., 2013), which are accessible through smartphones, including health related information. For example, half of smartphone

owners in US use their devices to get health information and one fifth of smartphone owners have health apps (Fox & Duggan, 2012). Despite some limitations of smartphones (Koushanfar et al., 2000), they can be used as services platforms for mobile health information delivery, access and communication (Nkosi et al., 2010).

MOBILE HEALTH

Challenges and Opportunities

As a business entity, a healthcare provider needs to have a comparable standard of customer service with other business organizations. It is a fact that customer expectations in healthcare are high, which create serious challenges for a healthcare provider, as it has to make an exceptional impression on every customer. In a competitive market, poor service drives customers to switch from one healthcare provider to another (Anshari & Almunawar, 2011). The adoption of mHealth will be a natural consequence of the adoption of smartphones. Hence, health services must be adjusted in such a way that people can access the service through their smartphones or other mobile devices (mHealth).

Most recent healthcare initiatives perceive customers (patients) as recipients of health care as they do not have a significant role in the decision making process of their health. However, the advancement of Web 2.0 offers patients to have a greater role in the decision making process related to their health. This is because they can be provided with the ability to have access and control of some of the personal information that fits with their personalized needs, which allows them to actively participate in decision-making process related to their health.

Web 2.0 tools have brought a possibility to extend e-health by enabling patients, patients' families, and the community at large to participate more actively in the process of health promotion and education through a social networking process. Embedding Web 2.0 in healthcare is a challenging task in order to provide a new meaning in building relationships between patients and healthcare organizations within a social network platform. In addition, social network applications that exist in smartphones can be utilized to facilitate interactions between patients and their healthcare providers.

Furthermore, the impact of Web 2.0 technologies for health continues to grow, and the term Medicine

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