

# Chapter 19

## Mobility in Healthcare: M-Health

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### ABSTRACT

*Mobility is the blossoming technology of our era. Mobile devices, especially smart phones, tablets, phablets are becoming common, and they are being a part of us as we carry all the time with us. Business discovered the easy-to-reach-customer facility of mobility and companies focus on this area. Scientific research focused on this area as well. Using the facilities provided with all the time with us mobile devices, especially healthcare can gain tremendous advances and have already done in some applications. Remote healthcare, decreased costs, advanced healthcare access, prioritizing the patients, can be given as examples to the advances that have been gained. As the mobile healthcare applications becoming common, there exists a danger of abuse and misuse. The need for regulations has emerged. The purpose of this study is to give basic information and vision about the usage of mobility in medical domain to ease healthcare and make it more effective. The mobile technologies used in the healthcare information systems, together with the challenges, problems and regulations, is explained.*

### INTRODUCTION

Mobility is the indispensable part of life today. We carry our computers in our pockets. First tablets appeared, used as an alternative of laptop PCs, when we are roaming and need computer for any purpose. Then they become smaller. Finally the phones become the mobile computers that we carry, they become Phablet, meaning phone tablet. As the storage and processing technologies make the hardware possible to be smaller, all areas of business try to make use of this fantastic

development. The more common the Phablet, the more in number the mobile applications are. Now almost all known companies have mobile applications, that can be used in Phablets. From banks to many commercial enterprises developed a mobile application for Phablets/smart phones and the users, we, liked it very much. We can make banking operations in the bus, have shopping at home, view and pay bills without depending on the place and time.

One of the areas which makes use of this facility to a great extent is Healthcare. Healthcare has

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welcomed mobility very well. The nature of the healthcare needed mobile technology and applications and it has forced the development for years.

Every healthcare institution, no matter what size, uses an information system. The information systems used in healthcare institutions are called as Healthcare Information System (HCIS). Electronic-Health (E-health) is the term for the use of electronic computation facilities in healthcare. HCIS is a part of E-health. The data and information is stored and disseminated electronically and easier when compared to the paper based system used in the past.

The orders of the patients are given by means of HCIS, test results of the patients are viewed by means of HCIS, in short we can say that, every piece of patient data is recorded and viewed by means of HCIS. The common way is employing desktop PCs in HCIS as clients. The nature of the work, especially for the inpatients, urges system designers to employ mobile technologies in HCIS. The mobility of healthcare staff, both in the institution and outside of it, makes it impossible to use HCIS by desktop PCs or stationary equipment. Morning patient visits, surgery side entries or views, inpatient monitoring, etc. are the additional issues that enforce mobility.

Mobility is not limited to access to HCIS for sure. There are many applications and hardware used. Wearable devices are available for patients. The term M-health (or mHealth), abbreviation used for mobile health, tells more about how intensively mobility is used in healthcare. It can be defined as “the use of wireless communication devices to support public health and clinical practice” (Kahn, Yang, & Kahn, 2010). Another wider definition may be “M-Health is the application of mobile computing, wireless communications and network technologies to deliver or enhance diverse healthcare services and functions in which the patient has a freedom to be mobile, perhaps within a limited area” (Pawar, Jones, Beijnum, & Hermens, 2012).

Wearable devices are used for a variety of purpose, most commonly to record vital signs of the patient during the daily life. Body/Personal Area Network (BAN/PAN) are constituted to manage and integrate these devices. Home Area Networks (HAN) are also available too. These issues will be examined in detail in the further parts.

Mobile healthcare applications have a wide area. In the USA, the mobile healthcare applications increased so much that Food and Drug Administration (FDA) drafted regulation guidance (FDA, 2012). In the USA, it is reported that more than 80% of health care providers use mobile devices and software applications (Moyer, 2013). Health Insurance Portability and Accountability Act (HIPAA) has also regulations for mobile device management policies. These regulations will constitute a part of the chapter.

Mobile healthcare applications are ranging from communication between individuals and health systems (call centers, appointment giving, treatment compliance, medication reminders) to the monitoring of health and surveillance (surveys, patient monitoring devices, recording vital signs), and they access to the information at the healthcare institution (test results, health records) (Barton, 2012). The healthcare areas using mobility intensively will be covered in the chapter.

To have the opportunity of mobility, we must have an infrastructure. Wireless technologies should be employed. Wireless Sensor Networks (WSN), Wireless Personal Area Networks (WPANs) (Examples are given above as BAN/PAN/HAN), Wireless Local Area Networks (WLANs), Wireless Access Protocol (WAP), Bluetooth, 3G should be employed for communication of mobile devices. The mobile infrastructures are another part that will be examined in this chapter.

When it comes to mobility, security issues become a big deal. Mobile devices give way to theft, loss, and computer virus exposure of the HCIS (Moyer, 2013). As of July 2012, 54% of the

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