

## Chapter 15

# The Development of a Secure Hospital Messaging and Communication Platform

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### ABSTRACT

*Pagers and phone conversations have been the stalwarts of hospital communication. With good reason - they are simple, reliable and relatively inexpensive. However, with the increasing complexity of patient care, the need for greater speed and the general inexorable progress of health technology, hospital communication systems appear to be increasingly inefficient, non-secure, and inadequate. Thus, this study is proposed to answer the key research question: How can ICT (information communication technology) solutions ameliorate the current challenges regarding communication inefficiencies within healthcare? To answer this question, the study will design and develop a bespoke ICT solution for a specific context using three strong theories; communication theory, activity theory and agency theory to make a robust body of knowledge for the proposed solution. Further, it will serve to establish proof of concept, usability and feasibility of the proffered solution. The study participants will be selected from medical and nursing staff.*

### INTRODUCTION

The penetration rate of mobile devices such as smartphone and tablet computers has increased globally and will continue to increase in the future. The number of global smartphone subscribers is expected to reach 3.5 billion by 2019 (“Forrester Research,” 2016). Due to the attractive features such as cost-effective sensors and wireless communication capabilities mobile devices have received great attention in the healthcare context. Kang et al. (2010) have notion that the ability to monitor patients’ health remotely is making mobile devices popular in the health domain. Mobile devices such as smartphone can

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measure heart rate, count the steps walked, and can tell calories consumed and utilized (Yu Rang, Yura, Guna, Jae Ho, & Soo-Yong, 2015). Mobile devices are being used in health care in different ways. For instance, patients are using mobile devices for consultation with doctors (Korzep, 2010). On the other hand, doctors are using mobile technology for real time monitoring/tele monitoring of patients (Slaper & Conkol, 2014; Zangbar et al., 2014). Therefore, mobile devices are changing the way healthcare is delivered and are offering mobility, flexibility, convenience and real time communication in healthcare.

The concept of using mobile devices in healthcare can be viewed as follows: any equipment (with different sensors) which can be worn as wrist band, implanted in the body or embedded with the living species, measuring different physical changes of the patients, monitoring physical activities, analyzing, alerting and communicating with healthcare professionals and patients from remote places (Dwivedi, Shareef, Simintiras, Lal, & Weerakkody, in press). The use of mobile devices in healthcare is benefiting the healthcare domain in many ways such as reducing cost and traveling time for patients and healthcare professionals. Hence, the concept of using mobile devices in healthcare is more beneficial than traditional healthcare services where patients have to wait in long queues and doctors remained overburdened.

The use of mobile devices in healthcare has enhanced the scope of health care services and in the near future will make health services more flexible (Agosti, Graziano, Artiaco, & Sorrentino, 2009; Ben-Zeev et al., 2013; I.-L. Wu, Li, & Fu, 2011). For example, Rana, Hume, Reilly, and Soar (2015) proposes an ensemble sensing network named w-health (wireless health) which can combine smart phone, smart watch and smart glass in one network and can be used in telehealth in the near future. Andersen, Lindgaard, Prgomet, Creswick, and Westbrook (2009) think nurses and clinician tasks performed during ward rounds, require highly mobile computing devices. With a clinical alert system, a message can be sent to doctors or nurses mobile device and they can talk while they walk. Further, use of mobile devices such as smartphones, pagers, tablets and Wi-Fi phones can speed up admit and discharge process, response quickly to patients, promote direct communication between clinicians and can communicate test results efficiently. However, the Academy of Australian Technology, Science and Engineering (ATSE) report says that assistive technologies such as mobile devices could play a vital role in reducing health care cost when they are socially accepted and widely adopted. Although, globally mobile devices are benefiting the healthcare system and widely used in healthcare however, their adoption is slow in the Australian healthcare system. Mobile devices such as tablets are used by doctors for only a small portion of clinical tasks such as sending reminders to the patients for next consultation. The Australian health department is in favor of using mobile devices (HCSC 2014). However, the majority of consultations are conducted face-to-face even after implementation of videoconferencing in primary care in Australia (Smith, Armfield, Croll & Gray 2012). An extensive systematic literature review reveals most of the mobile devices projects in the Australian healthcare system are implemented on a pilot basis. Hence, the uptake of mobile devices and their further use in the Australian healthcare is unknown.

Therefore, the objectives of this chapter are:

- To understand the perception of healthcare professionals about the use of the mobile devices in the Australian healthcare environment.
- To contribute to the knowledge of the adoption of mobile devices in the healthcare context.

The overall aim of this chapter is to develop a conceptual framework for the adoption of mobile devices in the Australian healthcare environment.

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