

# Chapter XV

## A Mobile Computing Framework for Passive RFID Detection System in Health Care

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### INTRODUCTION

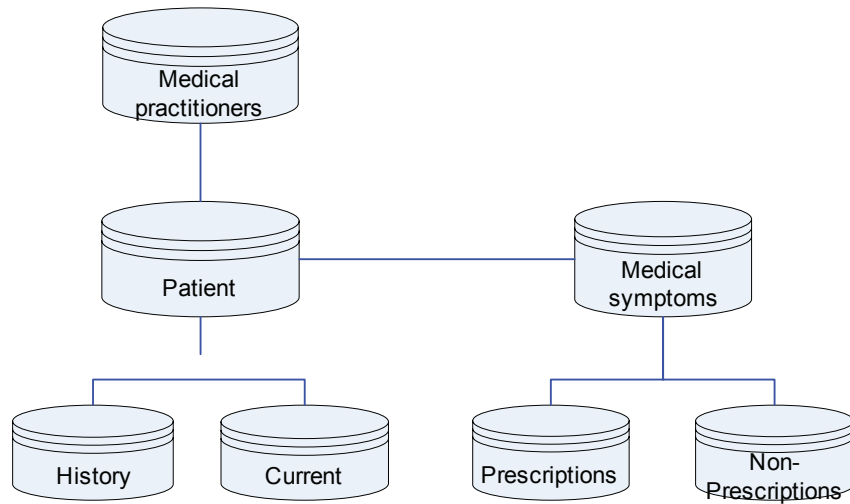
The cost of health care continues to be a world wide issue. Research continues into ways and how the utilization of evolving technologies can be applied to reduce costs and improve patient care, while maintaining patient's lives. To achieve these needs requires accurate, near real time data acquisition and analysis. At the same time there exists a need to acquire a profile on a patient and update that profile as fast and as possible. All types of confidentiality need to be addressed no matter which technology and application is used. One possible way to achieve this is to use a passive detection system that employs wireless radio frequency identification (RFID) technology. This detection system can integrate wireless networks for fast data acquisition and transmission, while maintaining the privacy issue. Once this data is

obtained, then up to date profiling can be integrated into the patient care system. This article discussed the use and need for a passive RFID system for patient data acquisition in health care facilities such as a hospital. The development of profile data is assisted by a profiling intelligent software agent that is responsible for processing the raw data obtained through RFID and database and invoking the creation and update of the patient profile.

### BACKGROUND

Health is on everyone's agenda whether they are old or young. Millions of hours of lost time is recorded each week by employers' whose staff are in need of health care. It is and has been known that more research into applications and

*Figure 1. Data repositories for patient and doctors*



innovative architectures is needed. To this end the use of Radio Frequency Identification (RFID), a relatively new technology and is showing itself to be a viable and promising technology as an aid to health care (Finkenzeller, 1999; Glover & Bhatt, 2006; Hedgepeth, 2007; Lahiri, 2005; Schuster, Allen, & Brock, 2007; Shepard, 2005). This technology has the capability to penetrate and add value to nearly every area of health care. It can be used to lower the cost of some services as well as improving service to individuals and the health care provider. Although many organizations are developing and testing the possible use of RFIDs, the real value of RFID is achieved in conjunction with the use of intelligent software agents. Thus the issue becomes the integration of these two great technologies for the benefit of assisting health care services.

To begin with, let us look at data collection. In health care, we can collect data on the patients, doctors, nurses, institution itself, drugs and prescriptions, diagnosis, and many other areas. It would not be feasible to do all of these nor would all of these be able to effectively use RFID. Thus for our perspective we will concentrate on a subset with the understanding that all areas could, directly or indirectly, benefit from

the use of RFID and intelligent software agents in a health care and hospital environment.

In this research, we begin to look at the architecture of integrating intelligent software agents technology with RFID technology, in particular in managing patients' health care data in a hospital environment.

An intelligent software agent can continuously profile a patient based on their medical history, current illness, and on going diagnostics. The RFID provides the passive vehicle to obtain the data via its monitoring capabilities. The intelligent software agent provides the active vehicle in the interpretation profiling of the data and reporting capacity. There are certain data that is stored about each patient in a hospital. The investigation of this data provides an analysis that describes the patient's condition, is able to monitor their status, and cross reflect on why the patient was admitted to the hospital. Using this information an evolving profile of each patient can be constructed and analysed.

Using the data and analysis this will allow us to assist in deciding what kind of care he/she requires, the effects of ongoing care, and how to best care for this patient using available resources (doctors, nurses, beds, etc.) for the patient. The

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