Chapter 14

User and Data Classification for a Secure and Practical Approach for Patient–Doctor Profiling Using an RFID Framework in Hospital

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EXECUTIVE SUMMARY

Utilization and application of the latest technologies can save lives and improve patient treatments and well-being. For this it is important to have accurate, near real-time data acquisition and evaluation. The delivery of patient’s medical data needs to be as fast and as secure as possible. Accurate almost real-time data acquisition and analysis of patient data and the ability to update such a data is a way to reduce cost and improve patient care. One possible solution to achieve this task is to use a wireless framework based on Radio Frequency Identification (RFID). This framework can integrate wireless networks for fast data acquisition and transmission, while maintaining the privacy issue. This chapter discusses the development of an intelligent multi-agent system in a framework in which RFID can be used.

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for patient data collection. This chapter presents a framework for the knowledge acquisition of patient and doctor profiling in a hospital. The acquisition of profile data is assisted by a profiling agent that is responsible for processing the raw data obtained through RFID and database of doctors and patients. A new method for data classification and access authorization is developed, which will assist in preserving privacy and security of data.

1. INTRODUCTION

Application of innovative architectures for secure access, retrieval, and update of data in healthcare systems continues to be needed for cost reduction and quality of service. To this end the use of Radio Frequency Identification (RFID) has been shown to be a viable and promising technology in the health care industry (Finkenzeller, 1999; Glover & Bhatt, 2006; Hedgepeth, 2007; Mohammadian & Jentzsch, 2008; Schuster, Allen, & Brock, 2007; Shepard, 2005; Angeles, 2007; Pramatari, Doukidis, & Kourouthanassis, 2005; Qiu & Sangwan, 2005; Mickey, 2004; Whiting, 2004). RFIDs has the capability to penetrate and add value to many areas of health care. RFIDs can lower the cost of some services as well as improve services to individuals and health care providers. The real value of RFID is achieved in conjunction with the use of intelligent software systems such as intelligent multi-agent systems. The integration of these two technologies can benefit and assist health care services.

Radio Frequency Identifiers (RFID) have been around for many years. Their use and projected use has only begun to be researched in hospitals (Fuhrer & Guinard, 2007). This research study considers the use of RFIDs and its potential in hospitals and similar environments. RFIDs can be more effectively used to collect data at the source thereby providing the data for monitoring patients well being in order to provide a higher level of patient health care. There are four areas where using RFIDs in their data collection role can have significant positive benefits in hospitals. These four areas are:

- **Care Tracking**: This is getting the right care to the right patient at the right time;
- **Quality of Care**: Improving the services given to the right patient at the right time in a timely manner;
- **Cost of Care**: Finding ways to be effective in the use of available resources such that the cost per patient per incident does not adversely increase to the cost of the resources; and