Chapter 3.13
RFID in Hospitals and Factors Restricting Adoption

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ABSTRACT

Hospitals are traditionally slow to adopt new information systems (IS). However, health care funders and regulators are demanding greater use of IS as part of the solution to chronic problems with patient safety and access to medical records. One technology offering benefits in these areas is Radio Frequency Identification (RFID). Pilot systems have demonstrated the feasibility of a wide range of hospital applications, but few have been fully implemented. This chapter investigates the factors that have restricted the adoption of RFID technology in hospitals. It draws on related work on the adoption of IS generally, published case studies of RFID pilots, and interviews with clinicians, IS staff and RFID vendors operating in New Zealand (NZ) hospitals. The chapter concludes with an analysis of the key differences between RFID and other IS, and which RFID applications have the greatest chance of successful implementation in hospitals.

INTRODUCTION

In 1989 management guru Peter Drucker described hospitals as prototypical knowledge-based organisations (Drucker, 1989). Considering the variety and volume of information that hospitals,

and other health care organisations, deal with, it is easy to see why they might be expected to be early adopters of IS. Kim and Michelman (1990) identify the components of a typical integrated Hospital Information System (HIS): General accounting and budgeting; Staff payroll; Patient demographic information and medical records; Nursing care plans; Treatment orders; Test results; Surgery and resource schedules; and Databases of clinical information relating to Radiology, Pharmacology, Pathology, and other specialist departments.

Yet research suggests that in comparison to other industries, the health care sector invests relatively little in IS. Twelve years on from Drucker's statement, a British survey of annual IS spending per employee found that the health care sector spent approximately one-third that of the manufacturing sector, one-fifth that of the distribution sector, and one-ninth that of the financial sector (Wallace, 2004). This low level of investment has led various stakeholders to demand greater use of IS in the health care sector. Two key areas in which significant potential benefits have been identified are improving patient safety, and sharing electronic medical records amongst all the health care organisations that may treat a patient.

Patient safety is, of course, paramount in health care. 'First, Do No Harm' is the fundamental principle of the medical profession. Yet each year medical mistakes take a heavy toll in both human life and health care resources. For example, errors in administering drugs, known as Adverse Drug Events (ADEs), are believed to result in tens of thousands of deaths, many more serious injuries, and to cost the health care sector tens of billions of dollars (Classen, Pestotnik, Evans, Lloyd, & Burke, 1997; Davis et al., 2003; Johnson & Bootman, 1995; Wilson et al., 1995). The US Institute of Medicine (IOM) strongly advocate the use of IS to reduce the incidence of ADEs (Institute of Medicine, 2001). Regulatory agencies, such as the Food and Drug Administration (FDA) and Joint Commission on Accreditation on Healthcare

Organisations (JCAHO), have mandated the use of barcode technology in US hospitals to improve identification of medications and patients (Merry & Webster, 2004). The NZ Ministry of Health has recently announced plans to spend NZ$115 million to implement systems such as Computerised Physician Order Entry (CPOE) and Barcoded Medication Administration (BCMA) (Johnston, 2007).

The leading cause of ADEs is the prescription of unsuitable drugs (Bates, Cullen, & Laird, 1995; Leape, Bates, & Cullen, 1995). Unsuitable prescriptions result primarily from clinicians lacking ready access to patients' medical records, and thus being unaware of drug allergies, existing conditions, and current prescriptions. Storing medical records in electronic form, in a centralised database, enables timely access to such information for all clinicians who may treat a patient. In the UK, the government is planning to spend around £6 billion on an Electronic Patient Records (EPR) system for the National Health Service (NHS) as part of the 'Connecting for Health' initiative (Wallace, 2004). In NZ, the WAVE (Working to Add Value through E-information) Advisory Board to the Director-General of Health recommended a similar system (WAVE Advisory Board, 2001), which has been included in the country's Health Information Strategy (Health Information Strategy Steering Committee, 2005). In Australia a non-profit company created by federal and state governments, the National e-Health Transition Authority (NEHTA), invests in IS that supports sharing of EPRs. The same approach has been taken in Canada, with the Health Infoway corporation. In the US, major insurers, such as Medicare, require hospitals to provide details of treatment in electronic form (Jonietz, 2004).

One technology that has been gaining attention in the health care sector for its potential to address these issues is RFID. It offers very similar functionality to barcode technology, but with a number of advantages (Schuerenberg, 2007). Most notably, RFID allows multiple labels to be scanned

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