Chapter 15
Pervasive Applications in the Aged Care Service

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ABSTRACT
This chapter presents a case study about the adoption of a wireless handheld care management system at an aged care facility in Victoria, Australia. The research evaluated the motivation for adoption and usefulness of the system in collecting patient data. It employed a qualitative technique to gather insights from two perspectives: operations staff as end users and management as strategic decision makers. These findings indicate conflicting views in terms of the usefulness of the pervasive application by the operations staff and the significance of this IT investment by senior management. Based on the understanding that IT investment often cannot be measured solely in monetary terms, the authors propose the use of the Balanced Scorecard approach to systematically evaluate the performance of the pervasive application in aged care facilities as such.

INTRODUCTION
Wireless Technology has brought forward a new spectrum of business practices. It is the key driver for pervasive computing that significantly transforms the way people do business in virtually every sector. Pervasive computing is experiencing rapid growth in terms of the capabilities of hand-held devices, services and applications development, as well as standards and network implementations. Key characteristics brought forward by this technology include scalability, invisibility, integration and heterogeneity (Saha & Mukherjee, 2003).
With the convergence of wireless and computing technologies, the Australian health care and aged care industries are moving towards the adoption and deployment of pervasive systems. To date, research into the design of pervasive care applications includes: ways to incorporate human values in the design; identification of the issues involved in capturing and satisfying multiple stakeholders’ needs and requirements in the design; augmentation of health care applications into everyday mobile devices; and assurance about the systems’ validity and usability through the use of a set of standard evaluation methods. As health care technologies are increasingly pervasive, we need sound evaluation strategies to assist with measuring performance. Research in this field indicates that evaluating ubiquitous systems can be difficult as evaluation approaches tend to focus on different aspects of the system, such as the users and usability aspect, the suitability aspect and the dependability aspect, to name a few. A variety of factors including scalability and context made it difficult to introduce a technical based evaluation framework. Besides, as this case study shows, a uni-dimensional (technical) evaluation can lead to differences in opinion between management and operation staff. Hence this chapter proposes the adoption of the Balanced Scorecard approach to evaluate performance of the pervasive application.

In exploring this issue, the chapter is organised as follows. The following section provides the context of the study, namely aged health care services in Victoria, Australia and presents an overview of the health care options, both public and private. The next section outlines the use of IT and pervasive systems in aged care services, highlighting the potential for productivity improvements raised by the deployment of this technology. This is followed by the reporting of a case study on the adoption of a wireless handheld system as part of an integrated health care management system at an aged care facility. Motivation for adopting the medication management system was concerned with the increase in incidences of medication related errors. In the subsequent section we propose the use of the Balanced Scorecard approach as a performance management tool for evaluating the performance of this system, as well as guiding future development in the use of pervasive systems. Finally we conclude the chapter.

**CONTEXT OF THE STUDY**

The context of this study is aged care in the state of Victoria, Australia. We limit our study to one state because, while health care is a federal responsibility in Australia, each state in the Commonwealth has their framework for administering health. With this limitation aside, the study may easily be extended to many other countries because the issues faced are similar in situations like ours where there is a mix of private and public options for aged care.

In the context of this study *residential aged care services* are public-health funded residential options for older Victorians who need care and can no longer stay in their own homes. Care may be high or low (as assessed by an Aged Care Assessment Service). Low care includes accommodation together with services such as laundry, meals, cleaning, and personal care services that help with daily living activities. High care additionally includes 24-hour personal and nursing care, and medical equipment. Services may specialize in low or high care, or offer both. The latter means that low care residents do not need to transfer to another facility when they are assessed as high care. This is referred to as ‘ageing in place’.

*Supported Residential Services* (SRSs) differ from the above. SRSs are private businesses that provide accommodation and care for: the frail; aged; those that have a physical, psychiatric, intellectual, or acquired brain injury or other disability; or those with particular needs such as dementia. SRSs vary in the services they provide, people they accommodate and the fees they charge. Some specialize in particular types of care, but generally
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