Chapter 76
Developing and Measuring the Business Case for Health Information Technology

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ABSTRACT

This chapter examines the adoption of information technology and information systems to support the clinical process. It explores popular models of information systems adoption and success, and relates these to the health it context. The end result of successful adoption of technology should be the improvement in performance of health care delivery, yet measurement of performance is complex. The various approaches to performance measurement are discussed. As one of the challenges in predicting the outcomes of adoption is the lack of consistent taxonomy, a solution to which is proposed. The chapter then looks at evaluation of it projects and considers what special factors may affect health it adoption and benefits in developing health care systems.

INTRODUCTION

Since the advent of the electronic computer, information technology has offered the potential to improve health care delivery. As early as 1946, the same year that ENIAC the first general-purpose computer was commissioned, the United States Army was looking to employ these new devices in planning of health care delivery (Rae, 1946). By the 1970s the use of computers had moved from the administrative realm into the clinical domain (Fanton, 1972). Much had been promised by the coming computer revolution, and in certain respects much has been achieved by computerisation.

In Australia where the authors are located, the announcement of a national electronic health record (EHR) system project in 2010 generated significant interest in health information systems in the wider community. Some researchers identified possible economic benefits to Australia of such a system to be in the order of billions of dollars (Sprivulis et al., 2007). The State of Victoria's Department of Health conducted a literature review of health information systems adoption around the world (Anonymous, 2012) and identified significant benefits associated with the adoption of electronic medical records (EMR) and concluded "*the literature reinforces the argument that EMR systems will be pivotal in enabling the efficient collection of meaningful, accurate and complete data that supports active clinical decision support and the development, implementation and optimisation of clinical pathways.*" As of 2016 we still see low adoption of the national EHR system[1] with the national government now looking to alter the regulatory regime to increase participation. Even in a country such as Australia that is generally regarded as an early adopter of new technology[2], the wide-scale uptake of health information systems has not been easy or simple.

Implementing information technology (IT) and particularly enterprise information systems into health provider organisations and networks is a complex organizational intervention that is mediated by many technical, structural, organizational, cultural and political factors. For this reason these projects are always challenging and often fail (Cresswell, Bates, & Sheikh, 2013; Nguyen, Bellucci, & Nguyen, 2014). There is increasing focus on the best protocols to use in implementation, stressing the need to consider the socio-technical aspects of implementation.

The methods of evaluating the business case for, and success of, health information technology are still in the early stages of evolution. There have been efforts to develop national systems of evaluation of IT adoption, for example the efforts in Canada are acknowledged to be highly advanced[3] (Lau, 2009; Lau, Hagens, & Muttitt, 2006; Lau, Kuziemsky, Price, & Gardner, 2010; Lau et al., 2012), and these have now been in use for nearly a decade.

Different technologies experience different challenges in implementation and adoption and have varying potentialities to generate benefit and improve health system performance; yet most of the research to date considers all technologies as being essentiality of singular type. One of the lacking elements required to support evaluation has been a comprehensive taxonomy of health IT. There has been something of a 'Tower Of Babel' problem in trying to compare one context of technology adoption to the next.

The goal of this chapter is to introduce the reader to a model that explains how a new information technology translates into better heath for patients and a better health system. It also introduces a taxonomy for classifying different technologies and a system for measuring benefits. This allows health system managers to measure and compare the relative return-on-investment from different technologies and to do this across organisations. The chapter concludes with a discussion on how to establish a systematic health IT evaluation program and uses the Canadian system as an example of a successful model. We will pay particular attention to factors that may affect establishment of such systems in developing countries.

BACKGROUND

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