Chapter 2.13
Enhancing 'Fit' of Health Information Systems Design Through Practice Support

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ABSTRACT

The design and implementation of healthcare information systems (HIS) is problematic as many HIS projects do not achieve the desired outcomes. There exist a number of theories to enhance our ability to successfully develop HIS. Examples of such theories include 'fit' and the sociotechnical approach. However, there are few empirical studies that illustrate how to understand and operationalize such theories at the empirical level needed for HIS design. This chapter introduces a practice support framework that bridges the gap between the theoretical and empirical aspects of HIS design by identifying specific process and information practice supports that need to be considered to actively produce fit of an HIS within a healthcare setting. The chapter also provides an empirical case study of how practice support was used to develop a computer based tool in the domain area of palliative care severe pain management.

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INTRODUCTION

The design and implementation of healthcare information systems (HIS) is problematic as many HIS projects do not achieve the desired outcomes. It has been reported that up to 30-50 percent of implemented HIS fail (Anderson, Aydin, & Jay, 1994) and in fact we may not know the true rate of failure of HIS due to the disincentives to publish about failures (Pratt, Reddy, & McDonald, 2004). Part of the problem is that a HIS needs to reconcile the complexity of both a healthcare domain area and an information system. Introducing a technical artifact such as a HIS will impact workflow, communication and other clinical tasks. Having some understanding about user requirements to achieve those clinical tasks will enhance our ability to design and implement HIS that meet user needs.

The concept of 'fit' refers to the need to establish fit between HIS and the organizational context where it is being implemented. 'Fit' was first introduced by Southon, Sauer and Dampney (1997) and further described by Kaplan (2001). Aarts, Dooreward,

and Berg (2004) suggest that fit is not a passive process but rather needs to be actively produced between the HIS and organization where the HIS is being implemented. Although the citations on 'Fit' have acknowledged its importance to HIS design there are few empirical studies that illustrate how to understand and operationalize fit at the detailed level needed for HIS design. Fit requires methodological rigor through qualitative research methods for understanding how HIS implementation impacts healthcare settings and for actively constructing fit between a HIS and a healthcare setting. However, the range of analysis that is possible in qualitative studies can be an obstacle as it can be difficult to determine how to study a healthcare setting to establish fit.

This chapter extends existing research on 'fit' by introducing a framework called practice support. Practice support refers to the need to understand all perspectives of how a HIS will impact healthcare providers when implemented in a healthcare setting. The chapter will describe existing theories and models related to fit of HIS and outline some of the limitations in the theories and models. It will then introduce the practice support framework and methodology, and provide a case study illustrating how the practice support framework was used to construct fit of a computer-based tool for palliative care severe pain management.

BACKGROUND

Theories and Models Related to 'Fit' of HIS

There exist a number of theories and models to explain the fit of HIS with healthcare providers and settings.

Berg describes the sociotechnical approach, which refers to increasing our understanding of how information systems or other communication techniques are developed, introduced and become a part of social practices (Berg, 1999). Sociotechnical approaches emphasize the interrelation between information systems and the social environment where they are used (Berg, Aaarts, & van der Lei, 2003). HIS design from a sociotechnical perspective is about finding the synergy between the particularities of healthcare and information and communication technologies (Berg, 2003). The sociotechnical approach is also about designing interactions between users and technology such as interfaces and information retrieval not from the view of the technology but rather from the view of the agents that work with the technology and the work practices where the technology is embedded (Coeira, 2003). However Berg, Aarts, and van der Lei (2003) subsequently point out that there is no actual sociotechnical per se, but rather it has many roots including methods such as participatory design and fields such as computer supported collaborative work.

The concept of 'fit,' which refers to the need to establish fit between the HIS and the organizational context where it is being implemented, has been discussed by Southon, Sauer, and Dampney (1997) and Kaplan (2001). Kaplan (2001) summarizes studies about fit that identify a number of dimensions as being part of fit including clinical workflow (Kaplan, 1995; Safran, Jones, Rind et al., 1998; Sicotte, Lehoux, & Denis, 1998), healthcare providers level of expertise (Sicotte et al., 1998), organizational setting and cultures (Kaplan, 1988; Massaro, 1993), communication patterns (Aydin, 1994) and cognitive processes (Patel, Allen, Arocha, & Shortliffe, 1998). An important consideration is that Aarts et al. (2004) suggest that establishing fit is not a passive process but rather fit needs to be actively produced between the technology and the practice where the technology is being implemented.

As the HIS discipline has evolved so has the appreciation for conducting studies within an interpretative framework. Interpretative studies have shown to be valuable for "producing an understanding of the context of the information