Using ANT to Uncover the Full Potential of an Intelligent Operational Planning and Support Tool (IOPST) for Acute Healthcare Contexts

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ABSTRACT

Based on initial pre-clinical data and results from focus group studies, proof of concept for an intelligent operational planning and support tool (IOPST) for nursing in acute healthcare contexts has been demonstrated. However, moving from a simulated context to a large scale clinical trial brings potential challenges associated with the many complexities and multiple people-technology interactions. To enable an in depth and rich analysis of such a context, it is the contention of this paper that incorporating an Actor-Network Theory (ANT) lens to facilitate analysis will be a prudent option as discussed below.

Keywords: Actor-Networks, Actor-Network Theory (ANT), Acute Care, Healthcare Delivery, Nursing Informatics, Operational Planning, Patient Safety, Quality Care

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INTRODUCTION

Acute healthcare settings are continually faced with a multiplicity of challenges. While there are many reasons for this, a key recurring cause relates to the volumes of disparate data and information that must be processed coupled with the multiple tasks that care givers, primarily nurses, must perform. Such a context appears to be appropriate to benefit from the design, development and use of an intelligent operational planning and support tool (IOPST). Based on results from both a pre-clinical simulation as well as from focus group studies, initial proof of concept for such a solution has been demonstrated. However, it is the contention of this paper that merely automating care planning and documentation of delivery is only a partial solution. The real benefits of such an intelligent solution lie in better understanding how it serves to augment and support various tasks that must be performed in an acute care context. To begin to explore these possibilities, it is essential to have a rigorous and systematic framework to guide such exploratory research. Thus, we have chosen to adopt Actor- Network Theory (ANT) as a suitable analytic lens to guide our research and analysis of findings. In this way, we are confident that we can in fact uncover the true potential of such a smart solution.

Further, we believe this approach can aid exploration of the “taken for granted” nature of technology by tracing the social as well as technical relations among actors and actants involved in the development, adoption, and use of a smart decision support system in acute healthcare settings (Callon, 1986; Law & Callon, 1992). Guided by the research question, “how can actor-network theory facilitate a deeper understanding of the true potential of an IOPST?”, the following serves to justify the role for using ANT in such a context. We begin by framing the IOPST in terms of the constructs of ANT.

ACTOR-NETWORK THEORY

Actor-Network Theory (ANT) is based on a recursive philosophy (Latour, 2005). Its fundamental stand is that technologies and people are linked in an often complex network. ANT tries to bridge the gap between a socio-technical divide by denying the existence of purely social or technical relations. In doing so, it takes a very radical stand and goes as far as challenging many of the conventional epistemological ideas and rejecting any distinction between subject or object, nature or culture and/or technology and society.

ANT assumes that each entity (such as technologies, organisations and humans) are actors. Therefore, they have the potential to transform and mediate social relationships (Cresswell et al., 2010). Further, it emphasises that entities (Actors/Actants), regardless of their nature; whether human, technologies or process, are not fixed. Thus, they do not have any significance on their own, but rather their significance depends on the nature of their relations with other entities in the network and their role which may change as their relations change (Law, 2006). This means that neither actors nor their relations are static and permanent; they change over time and across social and political contexts (Singleton, Michael, & UK, 1993).

Actors are essentially considered heterogeneous in nature, representing negotiations at different levels (e.g. political, social, technical and or economic levels). Further, the degrees of commitment, skills, constraints and prejudice among actors also can vary. Often, these represent a mixture of one or two of social, technical or personal levels (Latour, 1993). At the technical level, the role of technology may be involved to facilitate users by giving them accurate and up-to-date information when it is needed. The accuracy (effectiveness and efficiency) of the technology would be best determined or disputed by the users (nurses,