Tool for E-Health Preparedness Assessment in the Context of an Influenza Pandemic

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ABSTRACT

E-Health applications may mitigate the impact of a pandemic by facilitating disease surveillance and control activities, and improving performance of medical practices. The implementation of these applications requires proper planning and management. E-Health preparedness assessment represents an important step in change management, and including this step in its planning stage may increase the chances of its implementation success. This article presents a three-phase methodology that was developed and utilised in a collaborative project on E-Health preparedness assessment in the context of an influenza pandemic. Based on this project, a software tool set was newly developed to partially automate the assessment process.

Keywords: Analytic Hierarchy Process, E-Health, Influenza Pandemic, Methodology, Organisational Change Management, Preparedness Assessment

INTRODUCTION

The earliest case of influenza A (H1N1) (swine flu) was confirmed on 23 April 2009 in Mexico, and the World Health Organization (WHO) subsequently declared on 11 June 2009 the first influenza pandemic of the 21st century (Centers for Disease Control and Prevention (CDC), 2009; WHO, 2009). The 2009 influenza A (H1N1) pandemic resulted in millions of laboratory-confirmed cases and over 18,000 deaths in over 200 countries (WHO, 2009b).

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Although the H1N1 was not more infectious than seasonal influenza viruses and the mortality from the H1N1 appeared to be moderate, the morbidity level placed an immense burden upon healthcare services (Fraser et al., 2009).

Pandemic influenza was recognised by the Australian Centre for Health Research Limited (ACHR) as a threat to the hospital system, but there was no evidence internationally to inform the business continuity and resilience of the hospital sector. With calls for research in this area, the Asia-Pacific Ubiquitous Healthcare Research Centre (APuHC) in 2009 launched a new collaborative project titled ‘Pandemic Influenza, Human Resources and Critical Infrastructure Dependencies: Mitigating The Impact on Hospitals’ (MIoH). The MIoH project brings together risk analysis, business continuity planning and complex systems modelling methodologies based on E-Health to predict and mitigate the impact of a pandemic on the functioning of hospitals.

E-Health is an application of information and communication technologies (ICT) for health to, for example, treat patients, pursue research, educate health professionals, track diseases and monitor public health (Silber, 2003; WHO, 2010). In a pandemic situation, E-Health can facilitate pandemic responses as a whole through enhancing pandemic surveillance and control (e.g., rapid case reporting) and assisting information exchange (e.g., efficient documentation and sharing of patient records) (Kant et al., 2004; DoHA, 2007; Li et al., 2010a; 2010b).

Information systems’ researchers have recognised the problems of sustainability and complexity in E-Health implementations especially in resource-constrained developing countries (e.g., Braa et al., 2004; Miscione, 2007). E-Health preparedness assessment which occurs before the implementation can help the decision maker to be well-informed of deficient areas in preparedness, and therefore serve as a guide for preventive action to combat the failure to innovate (Jennett et al., 2003; Demiris et al., 2004; Brender, 2006).

The article presents an E-Health preparedness assessment methodology for a pandemic and a software tool set to partially automate the process of E-Health preparedness assessment. The rest of this article is organised as follows: the background section briefly discusses related work and identifies research gaps; the three-phase methodology section presents an overview of our research methodology that was developed in and utilised throughout the MIoH project; the E-Health preparedness assessment tool section reports in detail on the tool requirements, architecture, implementation and validation; we conclude in the last section with a summary of the paper, contributions and limitations of this study, and future work.

BACKGROUND

E-Health implementations represent a disruptive change in the healthcare workplace. Change occurs not simply due to the introduction of ICT infrastructure but also because the job design of interconnected health professionals should be re-engineered to effectively and efficiently accommodate the technology (Ford et al., 2006). Consequently, E-Health applications may fail due to organisational incapability to undergo the transformation during the implementation and/or resistance to change at the individual level (Jennett et al., 2004). The implementation of any information system in an organisational context requires proper planning and management for change (Callioni, 2006). Prior to E-Health implementation, a number of issues need to be assessed and addressed in the organisational context. As argued by Li et al., (2012), without healthcare providers’ dissatisfaction with the status quo and sufficient organisational resources required to support steps for change, a clinical ICT innovation would not succeed.

Current E-Health preparedness frameworks found in the literature (Campbell et al., 2001; Snyder-Halpern, 2001; Demiris et al., 2004; Jennett et al., 2003, 2004, 2005; Overhage et al., 2005; Wickramasinghe et al., 2005; Khoja et al., 2007; Li et al., 2010) were developed from different perspectives. Most studied components reflected healthcare providers’ and organisational perspectives, but there
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Critical Success Factors in Health Information Technology Implementation: The Perspective of Finnish IT Managers
International Journal of Healthcare Information Systems and Informatics (pp. 1-16).
www.igi-global.com/article/critical-success-factors-in-health-information-technology-implementation/125671?camid=4v1a