Towards the Development of a Model for Managing Health Technology Risk During Implementations

Elizabeth M. Borycki, RN, MN, PhD, FACMI[1], FCAHS, FIAHSI, Andre W. Kushniruk, MSc, PhD, FACMI[1], Katelyn Gosselin BSc (cand) [1]

[1]School of Health Information Science, University of Victoria, Canada

What might the attendee be able to do after being in your session?

After attending my session attendees will be able to:

(1) identify the key factors that lead to successful clinical health technology implementation,

(2) describe those strategies and approaches that lead successful health technology implementation in clinical settings,

(3) manage health technology projects using best practices that enhance the likelihood of success of a health technology implementation.

Description of the Problem

According to estimates of technology implementation failure in healthcare, approximately 80% of technology implementations are considered failures [1, 2]. In these cases some technologies are implemented, but are not used. In other cases, technologies are deployed in clinical health care settings, but are not used to the fullest extent by clinicians (i.e. not all of the features and functions of the technology are being used by health professionals to support patient care). Given the significant costs associated with implementing and re-implementing health technologies, there is a need to understand how health technology project managers are currently implementing systems in the context of traditional project management approaches [2]. Therefore, in this research, the authors study how health technology project managers implement systems.

Methods

A qualitative, in-depth interview study was undertaken with health informatics project managers, who are implementing health technologies in hospital and community settings. The participants were recruited via an email list serve with over 1000 health informatics professional members in Canada. In Canada health informatics (and biomedical informatics professionals) are involved in all aspects of technology implementation: innovation, design, development, implementation and maintenance of systems. Individuals who were interested in participating in the study were invited to take part in an interview, if they had implemented a health technology as a project manager or member of an implementation team. The participants were interviewed by telephone at a time a place that was convenient to them by a researcher. Participants were interviewed about successful and failed projects. They were asked about the factors and strategies that lead to a successful health technology implementation, those that lead to an implementation failure, and strategies that improved the likelihood of a success. All the interviews were audio recorded and transcribed verbatim. Interview data were qualitatively coded using model based coding [3] with Borycki and Kushniruks' Cognitive-Sociotechnical Framework [4]. Data were coded using key concepts and constructs from both frameworks. In cases where segments of data could not be coded effectively based on concepts from the frameworks a new concept was ascribed to the data segment and the concept was defined.

Results

Fifteen individuals agreed to participate in the study. All of the participants had a health informatics background, having graduated with a BSc or an MSc in health informatics. Participants were experienced project managers and analysts had implemented or had been part of an implementation team for a wide range of health technologies from

electronic health records to prescribing systems through to cardiac pacemaker technologies. Participants used a number of cognitive, social and technical approaches in their implementation of health technologies. These approaches included usability testing, clinician and administrator engagement strategies and the use of workflow modelling approaches. Of note, key factors associated with success included pre-assessment of organizational readiness, modeling of the organizational environment, clinician engagement, conducting usability testing prior to implementation as well as periodically during implementation, and a focus on training. In terms of the Cognitive-Sociotechnical framework, it was found that successful projects focused on all three levels of abstraction described in that model including: (1) the level of consideration of the individual user of the technology in isolation, (2) the level of use of the technology in completing specific work tasks, (3) consideration of higher level organizational processes and contexts of use of the technology being implemented. Factors supporting implementation success had cognitive and socio-technical components. Strategies that were used to improve the likelihood of a system being fully implemented had cognitive and socio-technical components included user engagement strategies such as usability testing and workflow modelling. Project managers needed to have an understanding of how work is done cognitively and physically, what and how changes needed to be made to the technology to achieve a strong fit between individuals and the health technology.

Conclusion

Implementation failures of health technologies can be costly. There is a need to understand the factors that lead to implementation success and the strategies that can be effectively used to ensure implementation success. Educating practicing health technology project managers and future health informatics professionals about the strategies that lead to successful implementations is critical to ensuring health technologies that improve patient work. To date, few researchers have attempted to describe how project managers understand healthcare settings and what approaches are currently used to enhance the likelihood of a successful implementation. Such research is needed to fill the health technology implementation research gap as there are a high percentage of technology implementation failures and such failures are costly to healthcare organizations.

Attendee's Take-away Tool

Understanding the factors and strategies that can be used to effect a positive health technology implementation is critical to ensuring the successful use of health technologies. Such knowledge prevents unnecessary expenditure of healthcare funds on technologies rather than patient care. The use of best practices during the implementation of health technologies is critical to implementation success of health technology projects and avoiding failed implementations of costly systems.

Use of Knowledge Acquired at Previous AMIA Events

The presenter (Dr. Borycki) has attended numerous AMIA conference workshops and presentations at American Medical Informatics Association conferences. She is a Fellow of the American Medical Informatics Association and a significant contributor to the research in the field of health informatics with over 220 peer reviewed publications.

References

1. Kitzmiller, R., Hunt, S., Sproat, SB. Adopting best practices. Computers Informatics and Nursing, 2006, 24(2), 75-82.
2. Gill R, Borycki EM. The use of case studies in systems implementations within health care settings: A scoping review. Studies in Health Technology and Informatics, 2009, 142-149.
3. Ericsson, Simon, H. Verbal protocol analysis. 1980.
4. Borycki EM, Kushniruk AW. Towards an integrative cognitive-socio-technical approach in health informatics: analyzing technology-induced error involving health information systems to improve patient safety. The open medical informatics journal. 2010;4:181.