How could we improve Health Care with Enterprise Resource Planning Systems? – A Literature Review

Elina Kontio[a,b], Heljä Lundgrén-Laine[a,c], Juha Kontio[b], Heikki Korvenranta[c], Sanna Salanterä[a,c]

[a] *Department of Nursing Science, University of Turku, Finland*
[b] *Faculty of Telecommunication s and e-Business, Turku University of Applied Sciences, Finland*
[c] *Turku University Hospital, Finland*

Abstract

The use of information systems in healthcare has increased rapidly during the last few years. These information systems are, however, stand-alone, independent and communicate poorly with each other. At the same time, healthcare operations are increasingly migrating towards process-based models. These kind of work flows need information systems that support decision making at different levels of the organization to improve the overall performance. Industry has used enterprise resource planning (ERP) in running and controlling processes. The question arises: could we use ERP also in health care - and if we could - in what way? Although there is a lot of evidence of the benefits of ERP systems in production industry, very limited evidence exists on the role of these systems in healthcare. We present a systematic literature review in order to analyze how ERP systems have been adopted in healthcare, and how these systems can improve healthcare.

Keywords:

Healthcare, Enterprise Resource Planning systems, Systematic review

Methods

The published literature from PubMed, CINAHL, CSA, Emerald, ScienceDirect and the ISI Web of Knowledge databases was searched, covering the period from January 2000 to April 2009. Studies were included if they concerned ERP integrated to healthcare. The chosen studies were qualitative and therefore an inductive approach using thematic analysis was adopted for the analysis.

The search identified 135 papers. First, the papers were analyzed by five persons based on the titles, then on the abstracts and finally they were analyzed by three persons based on the full texts. On every phase a set of articles were rejected and finally 10 articles were accepted for deeper analysis.

The scope of the studies was assessed against criteria concerning information about the type and field of the study, relation to ERP systems, and outcomes. First, the characteristics of each study were described. Second, statements concerning ERP systems usage, benefits, and implementation challenges were identified.

Results

Most of the reviewed articles reported case studies. The ERP systems analyzed in the reviewed articles focused on different areas in healthcare. Four main areas were identified: materials management, financials, clinical data management and human resource management. Seven articles described materials management as the area of ERP adoption in healthcare. Financials were introduced as ERP adoption area in healthcare in five reviewed articles. Similarly five articles named clinical data management as ERP adoption area in healthcare. Finally, human resource management was named in three reviewed articles as the area of ERP adoption in healthcare.

The reviewed studies showed many benefits of ERP to healthcare operations and processes. Eight areas of benefits were identified: Better data, Higher quality of information, Improved communication, More controllable resource allocation, Process improvements, Financial benefits, Better decision making and Better patient care. Furthermore, five challenge areas were identified for ERP systems development: Data management, Effectiveness, Project management, Processes and Resistance.

Conclusion

This paper summarized the reviewed studies of ERP systems showing many benefits and challenges encountered in healthcare. The modelling of the findings suggests that the information aspects, the transition in the processes together with improved decision making lead to better patient care. However, the findings also suggest that more research should be undertaken to establish, in more detail, the elements that make up a valuable ERP system in healthcare.