A Study of the Integration of Biomedical Devices with Information Technology Systems with an emphasis on Information Quality

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The cost of Information Technology in the US per year is estimated at 1.7 trillion of dollars. While this seems to be a large investment that should produce large returns in terms of quality care, patient safety, and improved healthcare, there seems to be a disconnect between Information Technology (IT) and the medical industry/systems [1], [2]. A disconnect or distrust of the data between biomedical devices and IT systems can become evident when data from biomedical systems (e.g., Electrocardiogram or EKG) are integrated or converged across a network into an IT system such as an Electronic Medical Record System when proper policies and procedures are not in place. Integration is defined by Merriam –Webster as the combining and coordinating of separate parts or elements into a unified whole [3]. While an integration of an EKG is mentioned and used in this proposal, case studies on other integrations will take place as well. The assumption that all the data gathered via an interface or device will be of a quality nature to the receiving system is not necessarily correct. Problems with electronic medical records and other IT health systems can lead to problems including loss of data [4]. This study proposes to look at the possible disconnect between IT and medical systems to try to ascertain why the investment does not produce the returns for healthcare. Some issues that will be researched include data quality, physician and medical staff acceptance and usage, and the problems that arise from implementation of new IT systems and the effects on healthcare patients and whether an integration project is a “success” [1].

The research will utilize a case study approach at various hospitals. The research would investigate completed or near completed integration projects concerning the integration of biomedical equipment and Information Systems (IS). The case studies will be conducted using interviews, surveys and collecting existing data. The case studies will compare data that was generated pre-implementation of the projects and post-implementation. The analysis will be based on comparing and contrasting the data collected pre and post implementation. The use of the case study will enable the research to utilize qualitative data as well as quantitative data. The settings (environment or culture) of the data collection can have a direct reflection on the end-user’s perspective [5]. By using both qualitative and quantitative data, a case study can examine both the processes and the outcome of disconnect between IT and medical areas [6]. The research is important from the standpoint of integration/quality, in how a project is conducted and how it will benefit users in the future and hopefully with the development of a functioning framework for integration and data quality (there is no standardized, simple approach to successful integration [7]. Few studies are available for IT or medical staffs to study for improving projects [8] [9]. The research that has been completed to this point suggests that studies are being performed on interoperability of device and IT with most looking at patient
outcomes but not on the data transfer quality [10] [9] [8]. This proposed research should enhance this area by building and incorporating an integration framework for use by IT and the medical field.

Citations


