

Maturity Models in Healthcare IS/IT Investments: Challenges and Trends

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INTRODUCTION

Healthcare systems play an important role in the European Union and are key to achieving stronger growth and creating highly qualified jobs in a dynamic knowledge-based economy. Improving the health of the population is the defining goal of healthcare systems. The performance of the health systems should therefore be viewed primarily from the perspective of how to improve the overall average level of population health and reduce inequalities in healthcare. The major evolution that is underway in healthcare is mainly driven by demographic changes, which included the increase of the aging population, chronic diseases, cultural changes, progress in sciences and technologies and the recognition of the need for greatly improved quality and safety in the delivery of healthcare. The exponential increase in computer capabilities, the broadening of the reach of the Internet, and the increasing ability to capture and make available the knowledge in a digital form constitute the main technological bases for the electronic conduction of current health care. Information Systems and Information Technology (IS/IT) are providing important opportunities for health stakeholders, providing services as well as ways of accessing information that consumers need. IS/IT are spread and adopted worldwide and used in many sectors, including the health sector.

According to several studies, there is a growing use of IS/IT by citizens and their families regarding the search for health information (Andreassen, 2007; Fox, 2011). Essentially, the purpose of investment in IS/IT is to improve the operational efficiency the organizations, reducing costs and improving levels of performance. Organizations in almost every industry rely on investments in IS/IT to realize benefits after their successful implementation (Gomes and Romão 2015).

The move toward computer information systems began from the 1970s that ultimate goal of these systems is access to Electronic Health Record (EHR) (Shortliffe and Baenett, 2014). EHR implementation results in the improved quality of care, cost effectiveness, customer-orientation and timely access to complete and precise information (Gagnon, 2014; Oderkirk, 2017). Despite the potential benefits of EHR, its implementation is a difficult and complex task whose success and productivity depends on many factors (Yusof et al., 2008; Terry et al., 2008).

The use of IS/IT provides an important support for specialized services, increasing efficiency, quality, safety, and reducing medical errors (Low and Chen, 2012). Despite remarkable technical progress,

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failures have still been reported when integrating technically sound systems into processes of healthcare (Lorenzi and Riley, 2003).

Academic literature has paid a considerable attention to the concept of MM (e.g. Crawford, 2002; Kerzner, 2005; Kwak and Ibbs, 2002, Pennypacker and Grant, 2003). MM have become an essential tool in assessing organizations' current capabilities and helping them to implement change and improvement in a structured way (Jia et al., 2011). Maturity model is a set of characteristics, attributes, indicators, or patterns that represent progression and achievement in a specific domain or discipline (Caralli et al., 2012). The purpose of the MM is to provide a framework for improving an organization's business result by assessing the strengths and weaknesses, enabling comparisons with similar organizations (Combe, 1998; Gomes and Romão 2014; Hartman, 1997; Ibbs and Kwak, 2000; Hillson, 2001). Organizations can use MM to compare their capabilities with the recommended *best practices* for the sector, identifying areas for improvement and development (Jugdev and Thomas, 2002). The proposition behind most MM is that organizations develop capabilities by achieving each level of capability in a sequence across a range of capability dimensions (Crawford, 2006). MM in IS/IT are understood as tools that facilitate internal and/or external benchmarking while also showcasing future improvement and providing guidelines through the evolutionary process of organizational development and growth (Mettler et al., 2010).

BACKGROUND

Maturity Models for IS/IT Investments

Overall, MM reflect the characteristics of an organization as they move through different stages in a change cycle, providing conceptual guidelines on essential requirements and components at each stage, including key success drivers and indicators (Duffy, 2001; Kim and Grant, 2010). Proper management of human resources is critical in providing a high quality of health care (Kabene et al., 2006). MM provide to health professionals, managers and organizations with an important framework for identifying the capability status of an IS/IT, and to plan and implement actions that allow them to advance to a higher maturity stage and thus achieve the proposed objectives. MM are a means to support effective management and continuous improvement for initiatives that are complex and have multiple components (Ahern et al., 2003; Crawford, 2006). A hospital with mature IS/IT infrastructure can reflect higher degree of IS/IT planning and control processes (Liu et al., 2011). Health care institutions and governmental organizations are starting to understand that the reasons underlying a certain inadequacy in the management of health processes directly relates to infrastructural limitations and their inefficient management (Sharma, 2008). Several models have been developed to help assess or describe the current level of IS/IT adoption in the healthcare sector (e.g. HIMSS Analytics Electronic Medical Record Adoption Model, Electronic Healthcare Maturity Model or Interoperability Maturity Model). These are useful benchmarks when looking at patient information systems. Many studies in IS/IT have indicated that system integration is another important challenge for the development of IS/IT within healthcare organizations (Grimson et al., 2000; Hasselbring, 2000). Several standards have been developed to cope with the problem of interoperability and integration for healthcare providers, particularly regarding the exchange of data between health organizations (Liu et al., 2011). Their ability to interoperate will significantly influence their capability to deliver safe, reliable, efficient and convenient healthcare services (NeHTA, 2007). The value of a generic methodology like the MM lies on the ability to develop a model which is char-

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