

Chapter 41

New Trends in Healthcare Information Systems (HIS) Integration

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ABSTRACT

The aim of this chapter is to introduce Service Oriented Architecture (SOA) governance as a paradigm to integrate Healthcare Information Systems (HIS) and e-health services. Healthcare professionals, patients, policymakers, and business partners increasingly require the utilization and enhancement of e-health services at a global scale. However, traditional approaches to integrate services in Healthcare Information Systems expose issues of concern like complexity, resistance to change, and organisational issues. On the other hand, SOA assures an environment of cooperating services where application services are interwoven within old and new applications. Nevertheless, SOA's nature to extend beyond the technical infrastructure to organization and human elements requires governance mechanisms to excel. SOA governance is a new research area that has the potential to assist in HIS integration. This chapter presents SOA governance aspect in a healthcare perspective and provides useful insights of an emerging issue.

INTRODUCTION

Information Systems (IS) improve the organization of work, as well as the availability and accessibility of information in an organization and support the automation and integration of busi-

ness processes. The integration of IS may further advance organizational performance, efficiency and effectiveness. Thus, there is an increasing demand for integrated solutions in the form of technologies, tools, and frameworks that result in cost and redundancy reduction.

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Moreover, current socio-economic market conditions have pushed various stakeholders to spend countless hours and amount of money on HIS modernization and integration to enhance electronic services provided to citizens and patients and in the long run reduce application's costs (Mantzana, 2006). However, these efforts has resulted in HIS that have evolved in a haphazard and fragmented way, and include data in crude formats without any attempt to synthesize or analyze them, as required by proper day-to-day management (Goldschmidt, 2005; Stefanou & Revanoglou, 2006). The need to provide an interoperable environment has become imperative, as the non-integrated nature of the healthcare systems is strongly associated among others with the medical errors that occur. For instance: (1) hard copy films are constantly lost/unavailable and (2) information needed for diagnosing is often missing (Cowan, 2004). Thus, as the information needed is not available on time, errors usually occur in prescribing, administering and dispensing drugs services to patients (Mantzana, Themistocleous, Irani, & Morabito, 2007). This has led to the development of new technological and/or managerial approaches towards the integration of HIS.

There is already significant relevance in addressing this topic as an area of research. For example, the United States of America with their reform plan (\$871 billion) attempts to adopt advanced electronic healthcare services that will render healthcare more efficient, limiting unusable processes and harmful interactions of medicines (US Government., 2009). Similarly, parallel effort can be seen in Europe where the HIS expenditure covers a big percentage of their healthcare budget promoting the integration issue as a top priority (European Observatory on Health Systems Policies., 2008).

To promote a debate on HIS integration, this chapter reviews the literature, with particular focus on Service Oriented Architecture. First, we look at the need of integrated systems and the key issues that manifest that need. Then, we examine

Clinical-Hospital, Regional and Global trends on HIS integration and provide valuable insights in the current approaches. Secondly, we introduce SOA as a paradigm to built and govern services. SOAs' ability to integrate desperate HIS and its numerous benefits from reusability to interoperability place it as a priority architecture in the healthcare environment. While, SOA is a complex topic and a complex organizational goal, with a reported 41% of SOA users having difficulties with its utilization, the SOA entrepreneurs do not invest resources in the non technical part of the implementation (Heffner, 2009). In this chapter, we offer an understanding of SOA in healthcare, identifying the need to implement such architecture. Moreover, we emphasize the importance of a strong SOA governance plan to control the human and managerial aspects of SOA. Accordingly, we present an updated review of the current state of research and conclude with valuable questions for further investigation that can assist system architects, developers, managers and healthcare professionals to their SOA project development.

HEALTHCARE INFORMATION SYSTEMS: NEED FOR INTEGRATION

During the last decades, the need for integrated Healthcare Information Systems has been amplified for many reasons with this chapter focusing on two key issues: (1) to reduce medical errors that cost human lives and (2) to support the provision of healthcare services at a global scale.

The first key issue is initiated by the requirements of consistent and accurate medical information exchange, a process directly linked to patients' treatment (e.g. allergies alert, patients history, medical conditions) (Anderson & Aydin, 2005). Despite the efforts made to improve the quality and exchange of medical information, it has been estimated that 5% of hospital admissions experience adverse errors with 30% of them causing consequential harm (Wachter, 2008). Medical

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