Profiling IT Security and Interoperability in Brazilian Health Organisations From a Business Perspective

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ABSTRACT
The proliferation of electronic health (e-Health) initiatives in Brazil over the last 2 decades has resulted in a considerable fragmentation within health information technology (IT), with a strong political interference. The problem regarding this issue became twofold: 1) there are considerable flaws regarding interoperability and security involving patient data; and 2) it is difficult even for an experienced company to enter the Brazilian health IT market. In this article, the authors aim to assess the current state of IT interoperability and security in hospitals in Brazil and evaluate the best business strategy for an IT company to enter this difficult but very promising health IT market. A face-to-face questionnaire was conducted among 11 hospital units to assess their current status regarding IT interoperability and security aspects. Global Brazilian socio-economic data was also collected, and helped to not only identify areas of investment regarding health IT security and interoperability, but also to derive a business strategy, composed out of recommendations listed in the paper.

KEYWORDS
Business Perspective, Data Security, Health Informatics, Interoperability, Questionnaire

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INTRODUCTION

The use of Information Technologies (IT) and Information Systems (IS) in healthcare organizations has since long taken a very distinctive route. Business processes conducted in this particular area are different and specific to these working environments (Reichert, 2011). Particular needs include not only security and privacy measures regarding patient health information, but also interoperability needs and standards that only apply to the healthcare sector. Take, for instance, the special security rules around the Health Insurance Portability and Accountability Act (HIPAA) (Asfaw, 2008), or the Health Level 7 (HL7) standard developed purposely for the exchange, integration, sharing, and retrieval of electronic health information (Health Level Seven International, 2015). Other recent developments also include new security standards and interoperability approaches for instance, for pregnancy care (Moreira, Rodrigues, Sangaiah, Al-Muhtadi, & Korotaev, 2018), Internet of Things (IoT) scenarios (Bujari, Furini, Mandreoli, Martoglia, Montagnero, & Ronzani, 2018).

Nevertheless, the healthcare sector still suffers from the lack of worldwide secure and interoperable IT and IS (Braunstein, 2018), with most efforts directed to the automation of daily routines within hospitals and overall health organizations (Moraes & Gómez, 2007; Venkatesh, Zhang, & Sykes, 2011).

In developing countries, this is aggravated by several socio-economic indicators, such as general poor health status, rampant diseases such as HIV/AIDS, and inadequate health services and policies (Davison, Harris, Qureshi, Vogel, & de Vreede, 2005; Braa, Hanseth, Heywood, Mohammed, & Shaw, 2007). Although Health Information Systems (HIS) are seen as crucial to reducing these problems (AbouZahr & Boerma, 2005), in practice issues like organizational complexity (Gladwin, Dixon, &Wilson, 2003) and fragmented and uncoordinated organizational structures, all contribute to a highly fragmented landscape where each organization ends up maintaining their own HIS (Chilundo & Aanestad, 2005).

This fragmentation is also the case in Brazil. While the use of IT in health organizations is widespread among most federal states and the access to information is a right granted by the Brazilian Federal Constitution, most citizens are not allowed to access their health records and transmit them digitally (Fornazin & Joia, 2016).

Current research studies also lack, in the authors’ point of view, an important business perspective, i.e., the perspective of a company with skills and experience in implementing health IT, with a fair knowledge of a certain country’s health IT share market, and with the purpose of becoming a new market entrant regarding Michael Porter’s five competitive forces (Porter, 1979).

In this paper, the authors performed an exploratory case study involving 11 hospital units to perceive the status of HIS security and interoperability. These issues are amongst the greatest concerns of the interviewed Chief Information Officers. Additionally, the authors of this paper formed a consortium, where academia and industry knowledge/skills gathered around well-established research methods, to perform a market study on the business status of health IT in Brazil.

A real private company (hereafter, referred as “the company”) was also part of the consortium, where its main health IT skills, interests and work capacity were considered for this study. Therefore, this business perspective takes not only from a focused profiling on the current use/implementation of concrete health IT technologies (in which this company excels) in Brazilian hospital units, but also on a macro economic and business analysis made up from data available in the World Bank database and empirical knowledge from the consortium.

Consequently, the research method is heavily influenced by two main drivers: 1) the academia members of the consortium proposing adequate health IT characterization methods such as questionnaires, interviews, statistical data analyses and market research; and 2) the industry and company members providing field experience and knowledge from a business perspective, to add value to decision makers wanting to become players in the Brazilian health IT market.

This paper is organized as follows: the next section refers background work on the characterization of health IT in developed and developing countries, particularly in Brazil. The authors then describe
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