Chapter 38
Risk Management Information System Architecture for a Hospital Center:
The Case of CHTMAD

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ABSTRACT

In modern day's institutions, risk management plays a crucial role as it aims to minimize the likelihood of adverse events and contributes to improve the quality of services delivery. In health care, an effective risk management is only possible if supported by information systems that can produce high quality measures and meaningful risk indicators. These indicators will then allow the healthcare organization to self-assess by identifying critical gaps and opportunities for improvement in several frontiers. Such an organizational thrust is not only warranted for competitiveness but also fundamental for the purpose of benchmarking, accreditation and certification. Additionally, monitoring of specific indicators is often required by the tutelage. However, the development of a risk management system can be an arduous process due to the inherent complexity of clinical systems. This paper presents an architecture for the implementation of a risk management information system, using as example the case of CHTMAD, a Portuguese hospital center.

1. INTRODUCTION

The idea of clinical *risk* is an emerging concept and is defined as an event that has a (direct or indirect) negative effect on the quality of health care, which may further threaten the safety of patients, cause high operational costs, or affect the image of the involved institution(s). In healthcare organizations, clinical risks may relate to many activities and challenges, including the provision of care (acts, materials and products, ethical and information risks), the security of the hospital's infrastructure (fire occurrence, electricity failures, computer failures, lack of water), the sound organization of the institution (loss of human resources, lack of protocols, nonconformities, patient transport, accidents, strikes and frauds), and more (Judson, 1998).

The risks patients face in health care are often multi-faceted as are characterized by the occurrence of adverse medical errors. Recent biomedical and technological advances have contributed to the decrease of these errors, enabling healthcare organizations to implement accurate clinical management systems to provide better quality care, more efficient use of resources, greater promotion of safety standards among professionals and other users, the identification of systemic failures, and the development of an ability and nurtured culture to learn from past mistakes (Hammond, 1994).

This article, following the work initiated in Costa et al. (2012), proposes a risk management information system (RMIS) architecture for a hospital center. In particular, it presents the case of the Portuguese hospital center, CHTMAD. Following the introduction, Section 2 introduces the concept of risk management, emphasizing the importance of information systems (IS) and health information technology (HIT) in this context. Section 3 describes the method adopted for this work. Section 4 draws several considerations on quality and risk indicators. In Section 5, a new architecture to support a RMIS in a hospital center

is proposed, which constitutes the main presentation of the CHTMAD case. The article concludes with some final remarks in Section 6.

2. BACKGROUND

In order to improve public trust and promote a culture of safety and quality, governments and public agencies have established accreditation programs seeking to evaluate healthcare organizations such as ambulatory care, clinical laboratories, primary care centers, and continuous care institutions (Miller et al., 2012; Sokol & Neerukonda, 2013). An accreditation program is a management tool to rate the engagement and commitment of hospitals to the continuous reduction of patients' risks and quality improvement.

Apparently, the two concepts of risks and quality are very closely related. Hospitals staff must be aware of accreditation standards, its goals and measurable parameters, in the pursuit for quality and patient safety. Patient satisfaction is recognized as a cornerstone of quality, and Health IT appears to offer a promising solution to improving patient satisfaction (Rozenblum et al., 2013). Staff satisfaction is undoubtedly also one of risk management main objectives. Staff risk awareness can be improved, for example, by ensuring that they take part in developing solutions, testing strategies, estimating staff and technical resources, and redesigning workflow to match patient needs. Therefore, this continuous search for quality improvement and risks reduction in patient care processes can be achieved only through joint efforts and collaborative management at both the Hospital and departmental levels (Ruland, 2004).

2.1. Quality, Patient Safety, and Role of Health IT

In order to improve the quality of care alongside risk management, value-stream mapping and

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