# Chapter 3

# Step towards Improving the Voluntary Interruption of Pregnancy by Means of Business Intelligence

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## ABSTRACT

*With the implementation of Information and Communication Technologies in the health sector, it became possible the existence of an electronic record of information for patients, enabling the storage and the availability of their information in databases. However, without the implementation of a Business Intelligence (BI) system, this information has no value. Thus, the major motivation of this paper is to create a decision support system that allows the transformation of information into knowledge, giving usability to the stored data. The particular case addressed in this chapter is the Centro Materno Infantil do Norte (CMIN), in particular the Voluntary Interruption of Pregnancy (VIP) unit. With the creation of a BI system for this module, it is possible to design an interoperable, pervasive and real-time platform to support the decision-making process of health professionals, based on cases that occurred. Furthermore, this platform enables the automation of the process for obtaining key performance indicators that are presented annually by this health institution. In this chapter, the BI system implemented in the VIP unity in CMIN, some of the indicators (KPIs) evaluated as well as the benefits of this implementation are presented.*

## INTRODUCTION

The use of Information and Communication Technologies (ICT) are increasingly, occupying an important place in society. The health sector is no exception, as these among other things, can provide complete and reliable information for healthcare professionals, allowing to support their clinical and administrative decisions and consequently decreasing medical errors associated to these decisions (Pinto, 2009).

Besides, ICT have a high potential to facilitate information sharing, communication and collaboration between health professionals, increasing the quality and efficiency of the health system as well as the use of Electronic Health Records (EHR) (Abelha et al., 2007; Khodambashi, 2013; Portela et al., 2010) is one of the goals.

In recent times, Business Intelligence (BI) technologies have been the target of interest to health professionals and to the Information Technology (IT) professionals, due to its applicability in EHR (Bonney, 2013). BI is a process that encompasses several methodologies, applications and technologies for collecting, storing, manipulating, analysing and providing access to data in order to help enterprise users making better and faster business decisions. Thus BI has the ability to operationalize the repository content of EHR in supporting evidence-based practice and improving the quality of healthcare delivery (Bonney, 2013; Mettler & Vimarlund, 2009; Portela et al., 2010).

In the case of healthcare organizations, the majority of clinical data documenting their daily activities are stored in a Relational Database Management System (RD-BMS). Because of the extensive amount of information, this information is stored in different ways and therefore highly heterogeneous with each other. On the other hand, a decision-making process, where it is necessary to integrate multiple data provided by clinical, medical, financial and administrative systems and where the sources are quite heterogeneous, large and complex becomes extremely important to meet the data quality that directly interferes in the success of the Knowledge Discovery Database (KDD) process (Mettler & Vimarlund, 2009; Raquel & Oliveira, 2012). So, with this increasing amount of information there is also a corresponding need to apply Data Mining (DM) technologies to extract knowledge from information / data stored in databases and providing real-time decisions (Bonney, 2013). Most clinical data are not structured and the DM techniques work well with structured data. It is inferred another advantage to using BI as a decision support technology since it allows the combination of structured and unstructured data (Bonney, 2013).

Furthermore, it can be stated that the Information Systems interoperability in an institution is one of the key factors in the decision-making process. Interoperability (Cardoso, Marins, Portela, Santos, et al., 2014) ensures systems standardization and allows passing all the inherent complexity of the different data sources ensuring data quality.

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