A Systematic Review for Predictive Models of IS Adoption

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ABSTRACT

The implementation of a new information system could be a risky decision for any company. In fact, many implementation decisions fail. Studying the success of IS adoption is necessary to identify the factors that impact success and to prevent risk. Many predictive algorithms and models have been used in order evaluate the IS adoption. This paper surveys the relevant predictive models that have been used in this area in the past 20 years. The authors aim to focus on information system adoption, as well as existing adoption models and theory, to put forth a state of the art survey on the issue to further understand the predictive models behind a successful adoption. Therefore, this paper opted for a systematic review to identify all of the articles that study IS adoption and that are using or suggesting a predictive model.

KEYWORDS

Adoption, ERP, Implementation, Information System, Predictive Model

INTRODUCTION

Technology is becoming an important factor for companies in order to maintain their competiveness (Shivam et al., 2019; Kinuthia & Chung, 2017; Lauria & Duchessi, 2007). In fact, IT helps organizations gain advantages in competitive markets (Arafat et al., 2019; El sawah et al., 2008) and has become strategic instruments to overcome the limitations of legacy systems (Plaza & Rohlf, 2008). In reality, information systems like Enterprise Resource Planning (ERP), which is an off-the shelf information technology package (Hadjji et al., 2012; Ifinedo, 2008; Stamelos et al., 2003), aims to integrate information and business processes within functional areas of business (Gupta el al., 2019; Hadjji et al., 2016; Nwankpa, 2015; Hadjji et al., 2012; Ifinedo, 2008) and helps executives manage resources (human, material, financial, etc.) efficiently and effectively (Yung-Ming, 2020; Samar & Mazuri, 2019; Hadjji et al., 2016; Hadjji et al., 2012; Ya-Yueh, 2006).

ERP systems are adopted by most large organizations (Hadjji et al., 2012). According to Plaza & Rohlf (2008), almost 19 percent of North American companies had an ERP by 1999. In 2011, revenue from ERP software was estimated at $23.3B (Rosa et al., 2013). The reason behind such success is

that information systems like ERP provide a seamless integration of all the information flow through an organization (Anna et al., 2020; Arafat et al., 2019; El Sawah et al., 2008; Ya-Yueh, 2006).

Implementing such systems is critical. According to Plaza and Rohlf (2008), it consumes a large portion of a company's resources. It requires ever-increasing investments in machinery and software applications through the specification and implementation of custom information systems in order to meet the need of the company (Gupta el al., 2019; Kinuthia & Chung, 2017; Stamelos et al., 2003). According to Salge et al. (2015) the annual IS expenditures are surpassing the $3 trillion threshold, making IS an important key strategic resource.

If successfully deployed, the adoption and implementation of ERP systems in business organisations could turn out to be a blessing (Arafat et al., 2019; Nwankpa, 2015; El Sawah et al., 2008). However, if not, it could turn into a nightmare.

In Canada, analysts explain that one of the factors in Target's failure was its ERP system (Jackson, 2016). Target is not the first company to face failure because of an ERP system; many other companies faced the same issues during an ERP implementation process. According to (Panorama, 2015)[1], 58% of the companies exceeded their planned budgets, and 65% experienced schedule overruns[2]. In some cases, the implementation of ERP turned out to be a curse. Moreover, according to Plaza (2008), 25 percent of technology related projects meet cost, schedule and functionality targets and 15 percent of all projects fail to deliver working systems.

Since the impact of such a system could be damaging, studying the success of information system adoption is of interest. In fact, predicting the adoption of an information system could be a solution to avoid failure.

Therefore, we aim to focus on some research in order to understand the adoption issue and how it has been studied, as well as focus on the prediction approaches that have been used in order to understand the success of an information system.

To the best of our knowledge, there is no systematic review regarding the predictive algorithms and models for IS adoption. Moreover, because the literature is diverse and concentrated on different levels of analysis, defining a complete framework enables us to summarize, map and assess the area of knowledge. For that reason, a systematic review is the most suitable method for managing the diversity of this knowledge.

This article begins with a review of the protocols to use and the reasons behind our choices. In the second section, we illustrate the descriptive analysis. In the third section, "analytic analysis," we present an in-depth analysis of a selected article. A conclusion and the implications of the research, which stems from our work, are presented in the final section.

METHODOLOGY

A systematic review is a method to identify, evaluate and interpret all available and relevant research related to a particular research question (Kitchenham; 2004). It can be undertaken for many reasons. In our research, we opted for it to summarize the existing literature regarding the predictive models in an Information System (IS). However, it could be undertaken to identify any gaps in current research in order to suggest new areas for further investigation and to provide a framework for new research activities, and so forth (Kitchenham; 2004). More importantly, however, is to synthesize existing work in manner that "is fair and seen to be fair" (Kitchenham; 2004).

In order to provide a suitable systematic review, some basic steps need to be respected: 1) identify the need for a systematic review; 2) select primary studies; 3) study a quality assessment (defining the exclusion and inclusion criteria); 4) data extraction and monitoring; 5) data synthesis (Staples, & Niazi; 2007).

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