

Modeling of Business Intelligence Systems using Potential Determinants and Theories

Subjects: Others

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Race towards industry 4.0 increases the hyper competition and puts pressure on organizations to integrate the advanced technologies. Business intelligence system (BIS) is one of the top prioritized technologies that attracted the significant attention of policy-makers and industry experts due to its ability to provide more informed and intelligent knowledge for decision-making processes. It is evident by literature that organizations and industries are prone to integrate the BIS at large scale, but more than 70% BIS projects fail to give the expected results. Hence, it is pertinent to explore the significant determinants that influence the BIS adoption and acceptance in organizations. Although previous literature did not have any comprehensive review relevant to the individual, technological, organizational, and environmental determinants. Therefore, the current study tries to narrow this gap by a systematic literature review (SLR) of 84 studies that were published during the period of 2011–2020. A total of 93 determinants are identified based on content analysis by using text mining techniques of Yoshikoder and human coding skills. The identified determinants are ranked according to their frequency of use. A theoretical framework has been developed with potential determinants and theories. The study results will enrich the recent BIS literature and improve the understanding of practitioners' decision-making processes to leverage maximum value from the adoption of BIS.

Keywords: business intelligence systems ; adoption ; acceptance ; determinants ; theories

1. Introduction

Business environments are becoming complex in the era of Industry 4.0. Therefore, enterprises need advanced innovations and technologies for quick response to the dynamic markets^{[1][2]}. The emergence of Business Intelligence Systems (BIS) is led by the rapid growth of technology and diffusion of the internet in the mid-90s ^{[3][4]}. BIS is generally known as a complete suite of tools, techniques, and methodologies that enable the firms to integrate and analyze large data sets in order to identify their weakness, strengths and opportunities^{[5][6][7]}. BIS is an information system (IS) that facilitates decision-making by i) management ,aggregation and integration of unstructured and structured data, ii) handling with large datasets such as big data, iii) offering ad-hoc queries, reporting, forecasting, and analysis solutions, iv) end-users support with advanced processing abilities to explore new knowledge^{[3][8]}. BIS has the ability to boost the internationalization process of organizations by sorting, summarizing, filtering and data integration from multiple channels^[9], such as competitors, host markets and local government^[10]. In contemporary trade, due to hyper-competition and technological advances with big data ^{[11][12]}. BI technology is still positioned among the best technological priorities of several decision-making authorities including business owners, chief executive officers (CEO) and chief information officers^{[3][13][14]}.

To compete in the traditional markets or online business, the BI solutions have attained great attention of industry practitioners for delivering better products and services with improved processes and managerial practices^[15]. It is depicted by drastic increase of the worldwide BIS market that increased almost 7.3% in 2017, with revenues up to \$18.3 and it is expected to reach \$22.8 billion by the end of 2020^{[3][16]}. It is evident by previous studies, that enterprises are failed to harness the true benefits from the adoption of BIS^{[3][14][17][18]}. In spite of its extreme importance, great market expansion and growing investments, more than 70% BI projects have failed to give the expected results^{[3][17][19]}. Enterprises are struggling hard to find the best determinants to make their BIS and big data integration successful by yielding the maximum benefits from the BIS^{[18][20]}. The academic research related to Big Data and BIS has thrived^{[21][22]}. In a large number of published studies, the practitioners and scholars are still discussing the tactical, management and strategic approaches to the successful integration and adoption of BIS^{[11][23]}. However, the existing body of knowledge is insufficient in this perspective. For example, Ting-Peng Liang and Yu-Hsi20 Liu have published a bibliometric study from 1990 to 2017 to identify emerging topics of BIS and big data analytics^[18]. Whereas, Hatta et al has conducted a systematic literature review of BIS adoption studies during the period of 2009 to 2015, they reviewed the theories which

are used for BIS adoption in small and medium enterprises (SME)^[24]. A systematic literature review of two decades (2000-2019) was conducted recently by Ain et al, they discussed the BIS adoption, utilization and success comprehensively^[3]. It is evident by literature review and bibliometrics studies on BI analytics that an extensive stream of BIS studies has been published till date^{[8][25]}.

2. Aim of the Study

However, to date, no comprehensive review is available in the perspective of adoption/acceptance with most significant determinants, theories and models at individual level or organizational levels. It is also suggested in literature that BIS adoption decisions are influenced deeply by considering the appropriate determinants^{[14][26]}. Enterprises also require to focus on user acceptance challenges to enhance the success of BIS projects^[3]. Qlik-Gartner-2019 report has predicted that by 2020, the number of data and analytics in enterprises would increase at three times than the rate of information technology (IT) experts, which will put pressure on organizations to rethink their organizational skills, expertise and models^[27]. Thus, this systematic literature review (SLR) aims to fill the existing gaps regarding the identification of potential determinants with the lens of individual, technological, organizational and environmental contexts. This study contributes a rich overview of BIS research from 2011 to 2020, presenting the recent development of theories/framework/models and significant determinants relevant to the BIS which led to the substantive guidelines for a novel theory. The theory, labeled as "Conceptual model and Theoretical framework for the BIS Adoption. The proposed framework would guide the industry practitioners to understand what kind of determinants and theories; organizations require to take into consideration with highest priority to leverage the true value of BIS. It may also serve to improve the scholars and practitioners' abilities to perform efficiently and effectively within the theoretical field^[28]. The following research questions (RQ) are addressed to achieve the study objective;

RQ1: What are the most deployed models/framework/theories in studies regarding the significant determinants for the BIS adoption and acceptance?

RQ2: What are the most significant determinants identified with frequency of use in the BIS adoption and acceptance studies?

RQ3: How to develop a theoretical framework with potential determinants and theories for the BIS adoption.

3. Main Contents

The paper is structured as follows. Research methods including content analysis are elaborated in the next section. Findings are discussed in the third section. A theoretical framework is designed using potential determinants with the lens of most applied theories and models in the fourth section. The theoretical and practical implications are discussed in section five and six respectively. The section seven outlines the research limitations and future research guidelines. The last section eight presents the conclusion.

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