

THE ROLE OF BUSINESS INTELLIGENCE CAPABILITIES IN BUSINESS AGILITY EVIDENCE FROM JORDAN

Luay Al-malawani¹, Mohammed Bteibet², Ali Al-douraki³

*Correspondence concerning this article should be addressed to:
Luay Al-malawani, Faculty of Graduate Studies at Universidad de Extremadura
- spain. E-mail: luayghaleb@gmail.com*

² *Mohammed Bteibet, Faculty of Graduate Studies at Universitat Jaume I
- spain. E-mail: mohammed.bteibet26@gmail.com*

³ *Correspondence concerning this article should be addressed to:
Ali Al-douraki, Faculty of Graduate Studies at Universidad de Sevilla
- spain. E-mail: ircs_jordan@yahoo.com*

Abstract

Today's business environment is characterized by fast and unexpected changes, many of which are driven by technological advancement. In such environment, the ability to respond effectively and adapt to the new requirements is not only desirable but essential to survive. Comprehensive and quick understanding of intricacies of market changes facilitates firm's faster and better response. Two concepts contribute to the success of this scenario; organizational agility and business intelligence (BI). As of today, despite BI's capabilities to foster organizational agility and consequently improve organizational performance, a clear link between BI and organizational agility has not been established. In this paper we argue that BI solutions have the potential to be facilitators for achieving agility in the Jordanian context.

Keywords: organizational agility, business intelligence (BI), Jordan, pharmaceutical sector

1. INTRODUCTION

Firms are increasingly seeking to generate, acquire, and translate their data into actionable knowledge in order to compete in today's dynamic climate (Delen & Demirkan, 2013; Rouhani, Ashrafi, Ravasan, & Afshari, 2018). As a result, Corporate Intelligence business intelligence (BI) was created to address specific business and managerial decision-making difficulties (Martins, Oliveira, & Popovič, 2014). Simply put, the goal of **BI is to evaluate available data and turn it into useful knowledge in order to alleviate informational demands**. The perception of 'speed,' or 'quickness,' is also part of agility. There is a dichotomous perspective of how flexibility and agility occur, according to Fayezi, Zutshi,

and O'Loughlin (2017) several researchers consider agility to be made up of several core elements revolving around the concept of flexibility (Prater, Biehl, & Smith, 2001), whereas others consider it to be made up entirely of the concept of flexibility (Backhouse & Burns, 1999; Richter, Sadek, & Steven, 2010). One facet of internationalization, on the other hand, is that organizations increasingly deal with a variety of national and regional cultures. Organizations usually believe they understand the cultures with which they interact, yet they frequently miss the nuanced subtleties and repercussions of those cultures (Kevin R Parker, 2010). Whether managers are conscious of it or not, culture has a deep and implicit influence on behaviour (Bensoussan & Densham, 2004). Planning, problem detection, situation awareness, uncertainty management, and decision making are all affected by cultural differences.

Scholarly interest in agility and flexibility has been steadily increasing (Brozovic, 2018; Harsch & Festing, 2020), with contributions from a wide range of academic fields, including strategy and management (Xing, Liu, Boojihawon, & Tarba, 2020). Furthermore, the existing body of knowledge on agility and flexibility has demonstrated that IB research is increasingly focused on the notion (Fourné, Jansen, & Mom, 2014; Xing et al., 2020). Despite a slew of articles in IB journals on the subject, the nature, breadth, and depth of agility and flexibility in IB research remain largely unexplored. Over the years, various literature reviews and overviews of existing research have been done to solidify the scope of this widely employed idea. They've improved our understanding of agility or flexibility in a variety of fields, including information technology (Tallon, Queiroz, Coltman, & Sharma, 2019), supply chain management (Fayezi et al., 2017), human resource management (Putnam, Myers, & Gailliard, 2014), marketing (Combe, 2012), and general management (Brozovic, 2018).

BI is one tool that has the potential to become a big enabler of agility. The advantages of holistic BI systems, which could make agility possible, include fast analysis, rapid deployment, and real-time monitoring of events via portals and dashboards based on trustworthy and reliable data (Mohanty, 2008). Scholars and practitioners have paid close attention to the themes of agility and business intelligence. A lot of effort has gone into addressing IT's role in achieving agility (Lu & Ramamurthy, 2011). The use of business intelligence (BI) as a strategic IT strategy to improve performance has been addressed (Chaudhuri, Dayal, & Narasayya, 2011). Some see agility as an enabler of BI, while others see BI having an impact on dynamic capabilities (Işık, Jones, & Sidorova, 2013; Kokin & Wang, 2014; Sidorova & Torres, 2014).

In light of the foregoing, the distinctive resources and originality of the firm's skills in terms of business networks, business intelligence capabilities, and business agility provide an important idea in strategic management. Furthermore, more research is needed, particularly in developing nations like Jordan; the major goal of this study is to discover the antecedents of business performance that might help academics and practitioners better utilise those resources and talents. The latest research finding is intended to fill a vacuum in the current literature on these viewpoints, reflecting the considerable need for new and promising ideas on the topic.

Previous research of business intelligence capabilities and business agility indicates a dilemma embodied the essential existence of a lack of study topics above holistically,

analyzed to reveal the contents, benefits, explore relationships. Logically, these relationships affect directly the success of the organization, which is the business agility as one of the dimensions. These direct and indirect effects are still questionable.

The researcher found a lack study has been conducted relating current study variable holistically, while business analytics plays as a mediating agent. As well as, the researcher can identify the gap through a lack of study linking business intelligence capabilities and business agility.

2. LITERATURE REVIEW

2.1 Conceptual framework

Researchers should carefully evaluate the right construct definition and present a clear conceptual definition for their proposed study constructions, according to (Rivard, 2014). Indeed, a lack of explicit definition might jeopardise structures' original meanings and increase the likelihood of having as many interpretations as readers. As a result, the current study's conceptual framework begins with a definition of each term.

2.2 Business intelligence capabilities

Decision support systems, which first appeared in the 1960s and grew in popularity in the mid-1980s, gave birth to business intelligence. At the end of the 1980s, a focus on business intelligence was placed on decision support systems, which began in computer-aided models built to enhance decision-making and planning (Elena, 2011). (Dresner, 1989) coined the phrase "business intelligence" to characterise concepts and approaches for improving business decision-making through the use of fact-based support systems (Tabatabaei, 2009). Business intelligence, according to Roozitalab and Sayadi (2018), is a systematic and continuous process of using smart tools in the organization's business environment and gaining the essential facilities for decision-making.

The basic BI capabilities produced by this study are explained using the BI's Sense-Transform-Drive (STD) conceptual model, which is based on dynamic capabilities theory and organisational evolutionary theory (Chen & Lin, 2021). It sees BI as a system that detects (discovers) environmental changes and converts new cognitive knowledge into an appropriate action mode to optimise business processes and resource allocation, resulting in a systematic capacity to drive organisational decision making and improve operating efficiency and effectiveness. This model can clearly show the sensing, transforming, and driving capabilities of BI, as well as the underlying mechanism of the system. However, there is currently a lack of theoretical agreement and measurement of the technology used in BI.

2.3 Business agility

Ganguly, Nilchiani, and Farr (2009) write in an exhaustive analysis of business agility research that the lean concept fits predictable situations with modest requirements, whereas agile principles are required when demand patterns are variable. Organizational agility allows businesses to quickly adapt their structures, reorganise their resources, and respond to market shifts (Harsch & Festing, 2020). As a result, it is a high-order capability that is based on and enabled by low-level capabilities that act as its building blocks (Ghasemaghaei, Hassanein, &

Turel, 2017). As a result, organisational agility is a critical component of a company's ability to thrive and grow in a volatile environment, and low-level organisational competencies enable it. As a result, it's a realistic strategy for bridging the gap between capabilities and performance advances.

Organizational agility, according to Lee, Sambamurthy, Lim, and Wei (2003), is a two-dimensional dynamic skill having an entrepreneurial or aggressive and an adaptive or defensive dimension. Entrepreneurial agility refers to the capacity to foresee and seize market opportunities ahead of time. As a result, it enables a company to adjust its positioning and plans, as well as establish new business approaches, in order to acquire an early edge in changing conditions. Adaptive agility, on the other hand, detects and responds to market dynamics in a defensive manner, such as safeguarding itself and remaining robust, in order to recover from market shocks rather than in response to any fundamental change in the internal structure or organisation. This research looks at how company agility is measured (Chakravarty, Grewal, & Sambamurthy, 2013).

2.4 Theoretical background

2.4.1 Knowledge-Based View theory

According to KBV, a company's knowledge resources are distinctive and inimitable. The firm's main goal is to turn them into profitable outcomes (Grant, 1996; Nonaka, o Nonaka, Ikujiro, & Takeuchi, 1995). Knowledge resources provide the firm with the basic foundations for reconfiguring its resource base and developing dynamic capabilities, such as organizational agility (Wu, 2006). Companies with a high level of employee awareness and involvement can more effectively identify the need for resource changes and determine the steps required to make these changes. (Nieves & Haller, 2014).

2.4.2 Dynamic Capabilities Theory

Teece (2007) proposed the Dynamic Capabilities Theory, which follows the post-positivist paradigm. In relation to the framework of strategic management, Chen and Lin (2021) develop a Sense-Transform-Drive (STD) Conceptual Model, which interprets the internal mechanics of BI as a system to sense (discern) environmental changes and transform new cognitive knowledge into an appropriate action mode to optimise business processes and resource allocation, resulting in a systematic capacity to drive organisational decision making and enhance operating efficiency and effectiveness. The model can show the sensing, transforming, and driving capabilities, as well as the BI's underlying mechanism. This conceptual model was created from literature relevant to business intelligence, and its use should have significant theoretical and practical ramifications.

2.5 The influence of Business intelligence capability on Business Agility

For businesses to improve organisational agility, business intelligence delivers extensive information and explicit knowledge (Lu & Ramamurthy, 2011; Mikalef & Pateli, 2017). Knowledge-based BI is critical for internationalising businesses to deal with volatile markets (Cavusgil & Knight, 2015; Chen & Lin, 2021; Sidorova & Torres, 2014). It is critical for internationalising businesses because the expressly international knowledge transformed by BI makes it easier for businesses to grasp foreign markets and compensates for many

businesses' lack of international experience and resources. Second, the provision of realistic options based on explicit knowledge is intended to improve resource commitment efficiency and facilitate stakeholder consensus on internationalising expectations (Yauch, 2011). The excellent expertise derived from BI is always useful in determining feasible solutions for building an organisational routine to address internal contradictions (Cegarra-Navarro, Soto-Acosta, & Wensley, 2016). As a result, the explicit knowledge generation based on the utility of BI improves the internationalising firm's organisational agility.

Organizations, according to systems theory, are systems. Organizational agility is a trait that emerges over time. The value of organisational agility is derived from two dimensions, according to the definition: one is sensing/detecting environmental change, and the other is acting/responding to it (Chen, Chiang, & Storey, 2012). Organizational agility will be aided by BI, which will improve an organization's ability to sense/detect environmental changes (Roositalab & Sayadi, 2018).

Some see agility as an enabler of BI, while others see BI affecting dynamic capacities (Işık et al., 2013; Kokin & Wang, 2014). Access to information, data-driven decision-making, and enterprise-wide information exchange, according to researchers, are essential aspects in offering early insight into business possibilities and disruptions (Chen & Siau, 2011, 2020). To improve agility, quick analysis and deployment are mentioned (Lu & Ramamurthy, 2011). The potential impact of BI on agility was briefly mentioned by Chen and Lin (2021). Using BI as a facilitator to achieve agility, on the other hand, has received less attention. There hasn't been a compelling argument presented in the relevant literature to justify the usage of BI to achieve agility.

Most prior studies have examined the effect of BI on organizations (Chaudhuri et al., 2011; Chen et al., 2012; Işık et al., 2013; Sidorova & Torres, 2014; Torres & Sidorova, 2019) and have determined the role of analytics as micro-foundations of the Dynamic Capabilities Perspective (DCP). The role of BI is treated as a single capability or technique, such as the Big Data Analytics Capability (BDAC) (Mikalef, Krogstie, Pappas, & Pavlou, 2020), the Big Data Decision-making Capabilities (Shamim, Zeng, Shariq, & Khan, 2019) or the Operational Research (OR) technique (Conboy, Mikalef, Dennehy, & Krogstie, 2020), etc., thus have not fully explored the complex capabilities of BI, especially missing an exploration on the complex systemic forces that are endogenous to BI in perspective of dynamic capabilities theory. Despite the fact that the DCP has been used by various theoretical investigations on BI (Mikalef et al., 2020; Wamba et al., 2017), no theoretical consensus has been established. There aren't enough measurement tools to look into the link between BI and firm performance. Furthermore, in the corporate sector, it is widely assumed that the impact of the external environment is the most direct issue to consider. In a chaotic and highly competitive market environment, firms frequently encounter the problem of information asymmetry.

In order to enable the first ability, BI can play a critical role. The present IS research on the topic also mentions the BI's contribution to organisational agility. Mithas, Lee, Earley, Murugesan, and Djavanahir (2013) defined information management capability (IMC) as an

all-encompassing concept that covers BI functions. They described IMC as the ability to (1) supply users with data and information that is accurate, timely, reliable, secure, and confidential; (2) provide universal connectivity and access with acceptable reach and range; and (3) modify the infrastructure to growing business needs and direction.

2.6 RESEARCH GAP

The literature review was conducted to understand the need for business agility in Jordanian companies. The significant research gap was observed through the literature review on the two topics of specific interest: business agility and business intelligence capabilities, is the lack of a unifying framework developed between the dimensions of business intelligence capabilities linking them to business agility. Some research works have been studied, and research gaps have been listed. More specifically, some studies have related business intelligence capabilities in general to business agility. Still, the dynamics of the dimensions of intelligence capabilities about business agility have not been undertaken in the context of the pharmaceutical sector. The research is rich in terms of the theoretical models both in intelligence capabilities but lacks empirical evidence for the interrelationships between the practices leading towards organizational agility. The study attempts to fill this research gap.

1. Most studies pertain to the international context.
2. Few studies are found in the intelligence capabilities practices of Jordan's pharmaceutical sector.
3. Limited studies on intelligence capabilities among the management levels, especially mid-level of Jordanian pharmaceutical Industrial.
4. It has been noticed that the business intelligence capabilities linking them to business agility in Jordanian companies is one of the upcoming research trends, and there is enormous scope to implement comprehensive frameworks and analyze and show how Jordanian pharmaceutical companies can make better use of this field to improve their overall agility.

3. Research Framework

The research framework is comprised of a collection of concepts and theories that aid scholars in identifying issues and formulating inquiries based on relevant literature (Smyth, 2004). The relationship between a dependent variable and independent factors is depicted in a research framework. The data that the scholar measures, predicts, or monitors is referred to as a dependent variable. It is expected that the scholar will manipulate the independent variables while affecting or changing the dependent variable with an independent variable. Specifically, three variables are examined based on the research topic entitled "The role of business intelligence capabilities in business agility evidence from Jordan". The dependent variable is Business Agility, and it relies on the following independent variables: Sensing capability, transforming capability, and Driving capability, as illustrated in Figure 1.

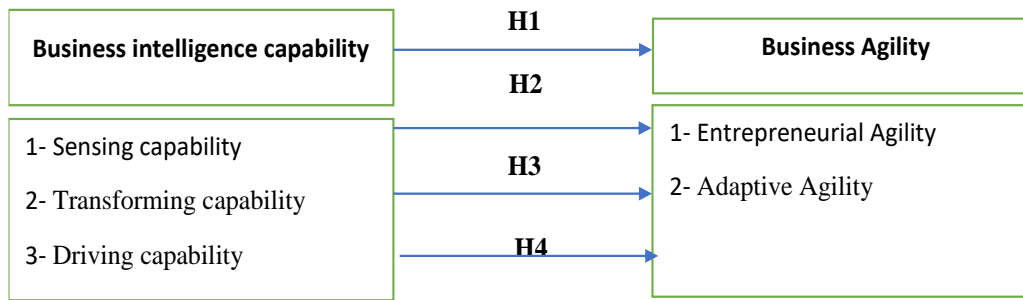


Figure.1: Research Framework

3.1 Hypotheses Development

Thus, depending on the study questions, the researcher was formulating the following hypotheses, as follows:

H₁: Business intelligence capabilities have a significant positive direct effect on business agility in Jordanian pharmaceutical Industrial listed firms.

H_{1a}: Sensing capability of BI has a significant positive direct effect on business agility in Jordanian pharmaceutical Industrial listed firms.

H_{1b}: Transforming capability of BI has a significant, positive, and direct effect on business agility in Jordanian pharmaceutical Industrial listed firms.

H_{1c}: Driving capability of BI has a significant, positive, and direct effect on business agility in Jordanian pharmaceutical Industrial listed firms.

3.2 Conclusion and Future Directions

BI increases responsiveness by providing real-time information, visualization, and flexible analysis capabilities. It can help organizations anticipate trends and changes and empower users. BI also augments adaptability by providing reliable and actionable insights. To optimize benefits, BI solutions have to be aligned with the organization's goals and deployed properly. In addition, the structure of the organization needs to allow data-driven decision making. Otherwise, the results extracted from BI solutions will not make a difference and the organization will resist the suggested course of action. Through this study (as a research-in-progress), we have preliminary theorized the link between BI capabilities and organizational agility. Our theoretical perspective should be further developed and validated through our on-going research. First, the link between BI capabilities and agility will be further specified. In particular, our on-going research aims to investigate how the four BI capabilities enable the three types of agility. Second, the proposed relationships will be validated using quantitative data that can be obtained through a large-scale field survey at the organization level. By utilizing secondary performance data of the sample firms, we also plan to examine the direct and indirect impacts of BI capabilities on firm agility through internal capability-building processes within a firm in the Jordanian context. The findings through our

on-going research will benefit both academics and practitioners who are interested in the strategic value of BI.

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