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كلية التجارة – جامعة طنطا

العدد : الرابع

ديسمبر ٢٠٢١

**The Impact of Business Intelligence on Organization  
Agility**

**The Mediating Role of Absorptive Capacity  
“An Empirical Study on Joint Venture Banks in  
Alexandria”**

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2021

## **Abstract**

This study aims at examining the impact of business intelligence on organization agility in joint venture banks in Alexandria and exploring whether absorptive capacity plays a mediating role in this relationship. A field study was conducted using a sample of 228 participants working in these banks.

Results revealed that organizational business intelligence has a significant positive direct effect on organization agility while technological business intelligence has a non-significant direct effect on organization agility. It was also found that absorptive capacity plays a mediating role in the relationship between technological business intelligence and organization agility, moreover, absorptive capacity is mediated the relationship between organizational business intelligence and organization agility.

## **Introduction**

Globalization is one among the first reasons of adaptation as Fishman (2007) clarified that the world nowadays is interrelated and suggested that any firm has the chance to strive internationally. Therefore, organizations, that are not agile, cannot survive within the global economy. Moreover, as the globe becomes more linked, complexness in handling new technology, rules and competitors rise. Organization agility is a very important element to attain associate dynamical environment. Doz and Kosonen (2008) devoted, “Being agile evokes staying nimble and flexible, open to new evidence, always ready to reassess past choices and change direction in light of new developments, and willing and able to turn on a dime” (p. 95).

Agile businesses are able to achieve quickly growing conditions, survive unexpected threats and succeed in competitive environments through manipulating on growing business opportunities (Lu and Ramamurthy, 2011). Therefore, agility is supposed to be crucial for business success, helping companies to achieve competitive performance in dynamic corporate atmosphere (Nazir and Pinsonneault, 2012).

As a set of techniques, business intelligence (BI) is defined as a voluntary process whereby a company can scan and aggregate information from a turbulent environment to acquire an available opportunity while diminishing the threats accompanied with uncertainty (Gudfinnsson et al., 2015). Several key actions, data collection, analysis,

and the sharing and distribution of information, have been recognized in the analysis of BI's function (Wamba et al., 2017). The impact of organizational agility on a firm's decision-making relies on the utility of BI, as BI provides widespread information and explicit knowledge for organizations to enhance the organizational agility (Mikalef and Pateli, 2017). Particularly, the knowledge based on BI is vital to the firm to deal with volatile markets (Cavusgil and Gary, 2015).

As businesses face concentrated competition, globalization, demand for innovation, and time-to-market pressures, absorptive capacity is considered to be a significant for business success (Lane et al., 2006). Absorptive capacity may be an organization's ability to spot valued external data, adjust or remodel this data into the firm's intellectual content, and apply this new knowledge through innovation and competitive activities (Cohen and Levinthal, 1990). Emerging and sustaining absorptive capacity is important to a firm's long-term survival and success because absorptive capacity will support, balance, or relocate the firm's intellectual content (Zahra and George, 2002). Investments in absorptive capacity conjointly rise a firm's capability to precisely anticipate innovation trends and to obtain advantage of growing opportunities before its competitors will capture them (Cohen and Levinthal, 1990).

Hence, the present research is seeking to evaluate the impact of BI capability on the organizational agility through the mediating role of

absorptive capacity. As well, the current research is seeking to study the effect of BI capability on enhancing or reducing organizational agility; meanwhile, the research also tries to test the relationship between BI and absorptive capacity.

### **First: Research Problem**

Regarding the banking sector that the current research will have it as an empirically tested sector specially the joint venture banks in Egypt. There are several problems regarding this sector in dealing with organization agility and business intelligence factors as follows:

1. *Overwhelming collection of data:* Most organizations face floods of data from a variety of sources, which creates confusion generated by an excessive perception of data. Valuable information often gets lost in huge amounts of data which can congest the systems that process and respond and thus decrease organizational agility.
3. *Un-standardized perceived data:* Data coming from different entities or from different contexts may have different formats or be incompatible with the organization's IS. This consumes time to convert the input into the centralized databases for processing, reducing an organization's ability to take action in a timely manner.

5. *Information accuracy*: The processing component may lack the capacity to analyze whether the data is correct, whether there might have been errors in perception or in the data received. If the correctness of the information is not validated, bad data will lead to bad analyses and probably incorrect responses.

6. *Information overload for decision makers*: The perception and processing capabilities of an organization can overwhelm decision makers with the amount of information they receive, which means that organizations can perceive and process adequately but fail to respond in a timely manner due to the bottleneck effect of decision makers.

7. *Time lag between installation of IS and organizational response*: If the design and implementation of complex IS taking a long time, it can be already out of date to support the changing business environments when it is finally implemented. This hinders effective perception and processing, and thus prevents timely and adequate responses.

8. *Inflexibility of IS*: IS that is tightly integrated to create high levels of stability can cause rigidity, because such systems are not flexible enough to be upgraded or realigned. Changing IS infrastructure often requires large investments including financial cost, time, and effort. In the unpredictable real world, the

embedded base of IS can become obstacles to agility due to its inability to respond to the needs of the changing environment.

9. *Technology dependence*: An automatic data collection and processing system provides operational efficiency, but it can also create satisfaction for the people who rely on them, avoiding learning. The simple failure of these IS can stop whole organizational procedures, because of the reliance of business operations on IS operations and job satisfaction from over-reliance on process automation.

10. *Greater propensity for error*: An incorrect or failed transaction can cause problems in subsequent processes in IS due to links. This phenomenon can cause unexpected consequences, especially when IS are not properly integrated together.

According to a pilot study conducted at CIB (Commercial International Bank), EBE (Export Bank of Egypt), Ahly Bank and Bank Misr including 12 employees working at executive levels. The study findings indicated that:

- Relying on the fixed organization structures that affects negatively on the ability of the banks to cope with environmental changes.
- Lack of training courses that advice employees about the importance of flexibility, adaptability, speed, and responsiveness which are needed in agile organizations.



- Does not exist any official mechanism that enhance speedy decisions in the organization to make it more responsive to any change happens in the environment.
- Lack of information available to middle and executive managers which affects their ability to do their jobs in a more effective way.

According to the above findings of pilot study, this thesis aims to broaden and deepen the collective understanding of the organizational agility construct and of its relationship with BI capability. Based on the results of the pilot study, this study proposes a multi-dimensional conceptualization of organizational agility construct related to BI capability and absorptive capacity. The proposed conceptualization is expected to improve the collective understanding of this construct and provide a reliable basis for the future studies that aim to develop psychometric properties for these constructs in our discipline.

**The research is trying to answer the following questions:**

- a. What is the role of BI capability on organizational agility? What is the role of BI capability on enabling or impeding the organizational agility?
- b. What is the role of absorptive capacity on organizational agility?
- c. What is the role of absorptive capacity on the relationship between BI capability and organizational agility?

## **Second: Research Objectives**

The main objective of this research is to show the effect of BI capability on organizational agility to determine empirically first, consistent with previous studies, and to show the mediating role of absorptive capacity on the relationship between BI capability and organizational agility.

The following are the research objectives:

- a. Determining the level of BI capability in joint venture banks
- b. Determining the level of absorptive capacity in joint venture banks
- c. Determining the level of organization agility in joint venture banks
- d. Testing the effect of BI capability on organizational agility.
- e. Testing the effect of BI capability on absorptive capacity.
- f. Measuring the direct relationship between absorptive capacity and organizational agility.
- g. Assessing the mediating role of absorptive capacity on the relationship between BI capability and organizational agility.

## **Third: Research Importance**

This research derives its significance through the additions expected to be provided at both the scientific and practical level.

### **At Theoretical Level:**

- The main research contribution is from testing the relationships between BI Infrastructure Flexibility and organizational agility and

the effect of absorptive capacity on organizational agility. This is accomplished by testing theoretically derived agility model to determine the influential role that BI infrastructure flexibility has on organizational agility.

- This research helps to fill the gap related to previous studies that can be found by studying the indirect impact of BI capability on organizational agility through absorptive capacity.
- The researcher tried to aggregate the most important dimensions of BI capability that affect both absorptive capacity and organization agility.
- This research represents a new stage in studying organization agility through BI capabilities and absorptive capacity.

#### **At Practical Level:**

This research will also be of interest to practitioners as follows:

- It provides insight into how BI capability affects organizational agility in banking sector.
- Understanding how BI affects organizational agility allows management to focus BI investments for processes which can affect agility. This allows management to identify which processes should be “exploited, developed, and protected” through absorptive capacity.

- Studying the impact of BI on absorptive capacity in banking sector enables banks to increase agility through BI investments and capabilities.
- The study will be conducted in banking sector in Egypt, applying the study to this sector will enhance the way banks work and face opportunities and threats in the dynamic environment.

#### **Fourth: Research Theoretical Background**

The following sections deals with the research variables definitions and their dimensions:

##### **4.1. Business Intelligence (BI)**

This study depends on a definition of BI as “a broad category of applications, technologies, and processes for gathering, storing, accessing, and analyzing data to help business users make better decisions” (Watson, 2009, P25). It is an umbrella term for systems and processes that transfer raw data into useful information (Chen and Siau, 2012). BI systems help decision-makers through business analyses on the basis of internal and external data (Abbasi and Chen, 2008). “Business Intelligence” (BI) usually represents integrated approaches to managerial and decision support based on the gathering, storage, modification, and analysis of data (Foley and Guillemette, 2010).

At the conceptual level, BI is an umbrella term for systems and actions that convert raw data into valuable information for managers to

make better decisions (Wixom and Watson 2010). At the operational level, BI is an information system that has three essentials (Laursen and Thorlund, 2010): (1) a technological element that gathers, stores, and distributes information and contains the general technology of BI that achieves fundamental functions to back up broad actions in BI: collect, store, access, and investigate data; (2) a human capabilities element on the abilities of humans to recover data and distribute it as information, to produce knowledge, and to make decisions based on the newly acquired knowledge. Although the basic functions of BI are provided, human workers still needed to gain certain knowledge/competency to recover data and create reports and make decisions based on the already made reports and (3) a third element that supports specific business processes that usefully get the information or the new knowledge for growing business values.

From the above definitions of business intelligence, the current research indicates dimensions of business intelligence to be as follows:

Organizational and technological BI capabilities do an important role in the success of BI systems (Kokin and Wang, 2013). They discovered BI capabilities in relation to the BI maturity model, which is practitioner emphasized. Business intelligence capabilities in academic research have got little focus, especially in relation to BI success (Işık et al., 2013), although information system (IS) research has discovered

capabilities in relation to organizational success and emerging competitive advantages (Chae et al., 2014).

Business intelligence capabilities characterized as organizational are flexibility, analytics (or intuition of analysis), and system risk tolerance (Işık et al., 2013) and the use and significance of these capabilities will differ by organization. However, their importance to BI success is regardless of any disparity. Each organizational capability plays an exact role in each organization, and thus understanding their impacts on BI success within decision environments is important.

According to literature, organizational business intelligence is being sub-divided into dimensions that include flexibility, analytics, risk tolerance, staff, and structure and coordination. These sub-dimensions are discussed in detail in the next sub-sections.

#### **a. Flexibility**

In rapidly changing business environments, data, and industries, IS flexibility plays a key role in decision-making (Schober and Gebauer, 2011); IS flexibility has become a key driver in generating competitive advantage and is an important resource for supporting businesses adjust to rapidly changing environments (Larson and Chang, 2016). Faced with determining the right balance of flexibility for their systems, IT managers seek to realize optimum success (Schober and Gebauer, 2011). Business intelligence system capabilities must help organizations' principal goals

but also reflect possible future changes (Işık et al., 2013). Furukawa et al. (2014) distinguished those businesses must move their perceptions of the business environment to uncertainty, and Schober and Gebauer (2011) specified IS flexibility has become a main factor in organizations' reactions and adaptations to rapidly changing environments.

Generating flexibility within businesses needs the ability to change rapidly and with relative ease to create, preserve, or strengthen a competitive advantage (Erol, Sauser and Boardman, 2009). The causes of IS flexibility are legacy tool and application integration, business process rules and regulations, and growth (Furukawa et al., 2014). Applying an information system that is compatible with legacy tools and applications aims to reduce costs and complexity. When business rules, policies, and regulations are rigid, IS become less flexible, whereas with fewer limitations, IS flexibility rises (Furukawa et al., 2014). For the purpose of this study, the researcher considered flexibility as an organizational BI capability because of its direct association with business rules, policies, and regulations.

#### **b. Risk Tolerance**

Risk happens in nearly every facet of business, especially in decision-making (Hsu et al., 2014). When taking a decision, organizational leaders must comprehend the known variables as well as the unknown variables that will impact the result of the decision. Thus,

risk tolerance levels differ for each organization. Considering their own risk tolerance, organizational leaders theoretically apply BI solutions that fit within their risk paradigms (Işık et al., 2013). Risk can ascend from many sources internally or externally (Hsu et al., 2014), and the BI solution can support businesses either lessen or rise their risk levels related to high rewards (Mohammadi and Hajiheydari, 2012).

### **c. Staff**

In the literature, there are numerous contributions to categorize BI users. On the one side, (Gluchowski et al., 2008, pp. 105 – 107) recognized three user groups from the practice of BI systems viewpoint. These groups are information consumers, analysts, and specialists. On the other side, (Knopf and Wortmann, 2011, p. 29) differentiated three different user outlines based on their capabilities of utilizing BI systems. These are user, power user and analyst. Finally, based on style of dealing with information for decision making purposes, (Eckerson, 2008) distinguished BI users into power users and casual users. Thus, two factors are considered to categorize BI users. These factors are the user capability of using BI systems and the user's informative behavior. Therefore, two types of BI users are known:

- *Power Users or Information Producers*: These are business analysts and IT professionals. They have the capability to produce reports, investigate data and achieve flexible navigation options in



the multidimensional data models (Gluchowski et al., 2008, p. 106). these users are considered as information producers, and they produce information that can be used for the decisions of business entirely.

- *Business Users or Information Consumers*: These are executives, managers, and operations staff. They are considered to be information consumers. The main source of their information is those offered by the power users. They use this information to make their decisions. Additionally, these users can only utilize the predefined standard reports that do not need any technological or methodological knowledge.

#### **d. Structure and Coordination**

Appropriate organizational structures as well as integrated strategies and activities are needed to attain BI agility (Westerman et al., 2014). BI technologies and tools have concerned interest from senior executives and consultants for their capability to exploit organizational data and deliver operational and strategic benefits through enhanced management systems. It is indicated that firms have basically failed to get BI investments effectively to exploit this wealth of data. As a result, BI has usually failed to support organizations' managerial decision-making at strategic levels and, consequently, failed to improve business value. Nevertheless, BI integration takes a significant role in interpreting

organizational resources into capabilities that increase the business value of BI.

Technological capabilities denote as “shareable technical platforms and databases that ideally include a well-defined technology architecture and data standards” (Işık et al., 2013, p. 15). Technological BI capabilities are data sources, types, their reliability, system interactions, and access. When mixed with an organization’s needs and managerial capacity, technological capabilities become main factors in offering accurate information to rise firm decision-making capabilities. As with organizational capabilities, technological capabilities play specific roles in organizations, and thus comprehending its impacts on the overall BI success of organizations’ decision environments is important.

According to literature, technological business intelligence is being sub-divided into dimensions; these dimensions include data source, data type, data reliability, system interaction, and accessibility. These sub-dimensions are going to be discussed in detail in the next sub-section.

#### **a. Data Sources**

Organizational data sources can be either internal or external to an organization. In most cases, internal data come from sources such as data warehouses, data marts, and data cubes, from which data created from internal systems such as transactional systems, whereas external data come from outside sources of an organization.

Organizational decisions rely on internal or external data sources, and high-level strategic decisions need more external than internal data because these decisions tend to emphasize more on external environments. External data can come from vendors, government agencies, news outlets, and many other sources. External data can identify problems for organizations when files must be cleaned, organized, and formatted before they will fit into the data model at a data warehouse (Schlesinger and Rahman, 2016).

#### **b. Data Type**

The data type is the “nature of the data” (Işık et al., 2013, p. 39), and data types are (a) numerical or nonnumerical and (b) dimensional or nondimensional. Nonnumerical, nondimensional data are qualitative, whereas numerical and dimensional data are quantitative (Mohammadi and Hajiheydari, 2012). Data that are relational and subject oriented are considered dimensional and dimensional data are the backbone of all relational databases (Mousannif et al., 2016). Dimensional data describe aspects such as geographic location, product name, product type, and reporting hierarchy.

Numerical data refer to any data that can be measured, especially through statistical means (minimum, maximum, mean, median, mode) or applied to a numerical scale (Baars et al., 2016). Nonnumerical data are

stored in formats that cannot be measured (other than frequency), such as text or video files.

### **c. Data Reliability**

Data quality is the degree of data accuracy and match with a particular instance (relevance) or how complete, timely, and consistent the data is (Foshay et al., 2014). Business leaders rely on the enormous amounts of data they collect to make decisions every day; therefore, making data accuracy and reliability is important input for BI solutions (Işık et al., 2013). According to Chaudhuri et al. (2011), data quality endures to be an issue for businesses, and several tools are available that can be hired to increase data accuracy and reliability.

Organizational leaders hire tools that achieve extract, manage, and load functions that support strengthen database rules, structures, and reliability. Businesses often utilize uncontrolled information sources to inhabit portions of their databases (or input the information directly into BI tools) to seize all relevant data. However, data from these uncontrolled sources can contain errors that can make the intelligence unacceptable (Işık et al., 2013).

### **d. System Interaction**

The goal for many firms is to have an enterprise centric IS model that binds the power of system integration at multiple levels throughout the business. Prior research distinguished that organizations function in

volatile environments that need rapid but informed decision-making and exploiting the information available, for which system integration is an obligation.

System integration is a vital aspect of BI due to the complexity of business decisions, which can need input from data sources both internal and external to the organization (Wong et al., 2011); many organizations have enterprise information integration and enterprise application integration technologies devoted to increasing system integration (Thamir and Poulis, 2015). System integration is not easily gained in all cases because data definitions and structures, stakeholder agreement, security, and system limitations encounter in organizations. For the current study, a definition used by Işık et al.'s (2013) of system integration, which is a technological capability of BI according to its dependence on the IT infrastructure.

#### **e. Accessibility**

Business intelligence consumers have different necessities across businesses, and these different necessities may need different BI tools (Schlesinger and Rahman, 2015). Different decisions need different analytical input, whether from flat file reports or visualizations. Organizational leaders may utilize common, enterprise-wide BI tools or use multiple tools for different purposes (Chaudhuri et al., 2011). According to Bischoff et al., (2015), a BI system's full potential is only

realized through continuous use, thus accessibility is an important factor in BI success.

#### **4.2. Absorptive Capacity**

The most comprehensive reconceptualization of the absorptive capacity is that which Zahra and George (2002) recommended. They related the construct to a set of organizational procedures and strategic processes through which businesses acquire, assimilate, transform, and apply knowledge with the goal of making a dynamic organizational capacity. There are four capacities or processes their definition represented the four dimensions of absorptive capacity which combine naturally and shape one other to generate a dynamic organizational capability.

Consequently, the current study defines **absorptive capacity** as *the systematic, dynamic capacity that exists as two subsets of potential and realized absorptive capacities. **Potential Absorptive Capacity**, which knowledge acquisition and assimilation capabilities show, captures a firm's efforts expended in valuing, acquiring, and assimilating new external knowledge. **Realized Absorptive Capacity**, which is reflected in knowledge transformation and application, represents the firm's ability to integrate and reconfigure the existing internal knowledge and the newly assimilated knowledge and to incorporate this transformed*

*knowledge into firms' systems, processes, routines, and operations, not only to refine existing knowledge and competences but also to create new operations and competences.*

Following Zahra and George (2002), these four dimensions are grouped into two components: potential absorptive capacity (acquisition and assimilation) and realized absorptive capacity (transformation and application). This difference is justified because, by defining two large blocks of capacities, the study of their multiple antecedents and consequences, and the analysis of the relationships between both components are easier. In this sense, Zahra and George (2002) state that potential absorptive capacity impacts competitive advantage through managing flexibility and the developing resources and capacities, while realized absorptive capacity does so through the development of new products and processes. Consequently, the academic difference between Potential Absorptive Capacity and Realized Absorptive Capacity proposes that externally acquired knowledge undergoes multiple iterative processes before the business can successfully use this knowledge to create value. In this sense, firms that aim at developing absorptive capacity process could hinder this process if they do not foster both components.

***Acquisition.*** Acquisition denotes the firm's ability to recognize and obtain beneficial knowledge (Fosfuri and Tribo, 2008). They noted

that the potential to get new knowledge will inspire the business to participate in external relationships (e.g., inter-firm collaborations, partnerships, etc.). Such relationships help the transfer of knowledge and permit the business to acquire knowledge from diverse sources. When searching for knowledge, businesses participate in “active listening” to scan the environment regularly and largely (Liao et al., 2003: 67), and as a result of listening and communicating, new knowledge can be attained from a diversity of sources across various fields (Fosfuri and Tribo, 2008). By surveying, businesses are more likely to recognize new, beneficial knowledge. Once the new knowledge is recognized and perceived as valuable, the knowledge is then transferred across the boundary of the firm, and other knowledge-based dimensions are applied.

*Assimilation* permits the absorption of new knowledge (Daghfous, 2004). Although this conceptualization was showed at the individual level, it has been applied to the business to describe the assimilation of knowledge (Todorova and Durisin, 2007). Therefore, assimilation characterizes a firm’s ability to “analyze, process, interpret, and understand” (Zahra and George, 2002: 189) newly acquired knowledge. Assimilation also permits the business to comprehend the new knowledge, determine whether the new knowledge fits with the prior knowledge of the company, and whether the new knowledge must be changed to fit with the existing knowledge structures (Zahra and George, 2002). It is through the assimilation dimension that knowledge is



interpreted to ensure proper fit with the existing knowledge structures in the company. In other words, assimilation is the analysis and comprehension of new knowledge by the business.

**Transformation** permits the business to improve knowledge routines. After knowledge is adopted and comprehended, it is then combined with the internal knowledge structures of the business. When new knowledge pass in the business, unsuitability may happen between the new and existing knowledge; consequently, the cognitive structures of the firm will secure transformation to guarantee proper fit (Todorova and Durisin, 2007). Transformation permits the firm to modify, adapt, and combine new knowledge with internal knowledge (Fosfuri and Tribo, 2008), and once the knowledge is combined into the business, it can then be used by the firm. Hence, the transformation dimension represents the process of combining newly acquired knowledge with existing knowledge when the new knowledge does not have an exact fit with the current knowledge structures of the firm (Lane et al, 2006).

**Exploitation.** Exploitation helps the process of utilizing the transformed new knowledge to generate an incremental change or modification to the firm's existing value-creating capabilities (Benner and Tushman, 2003). The final result of such change is the formation of new goods, processes, or new organizational forms. When newly altered knowledge is exploited, it results in enhanced competitive advantage for the firm (Fosfuri and Tribo, 2008). Exploitation is a component of the

relation between the acquisition of knowledge and competitive advantage, such that before attaining a competitive advantage, the company must first apply the knowledge attained and apply it for use.

### **4.3. Organization Agility**

Organizational agility, the ability to flexibly react to changes in the environment by quickly modifying product and service contributions, is highly critical to achieving sustained competitive advantage (Singh et al., 2013).

Lu and Ramamurthy (2011) defined agility in terms of market responsiveness and operational adjustment ability while Tallon and Pinsonneault (2011) defined agility to be a combination of customer, operational and partnering agility. Roberts and Grover (2012) revised the literature and discovered different definitions of agility and selected to conceptualize customer agility as a dynamic capability encompassing sensing and responding capabilities.

Lee et al. (2009) conceptualize organizational agility as a two-dimensional dynamic capability, with an entrepreneurial or offensive and an adaptive or defensive dimension. Entrepreneurial agility infers an ability to anticipate and seize market opportunities proactively and thus permits a business to adapt its positioning and strategies and organize new business approaches to increase advantages in changing conditions. In contrast, with adaptive agility, the business perceives and responds to market dynamics in a defensive manner, such as saving itself and

remaining strong, generally in a try to recover from interruptions in market forces rather than in response to any essential change in the internal structure of the organization.

Sambamurthy et al. (2003) further anticipated that agility has the three dimensions of customer, partnering, and operating agility. *Customer agility* is defined as the presence of customers in the exploration and exploitation of opportunities for innovation and competitive changes. *Partnering agility* is the ability to influence assets, knowledge, and competencies of suppliers through partnerships, alliances, and joint ventures. *Operational agility* is the ability to realize business processes with speed, accuracy, and cost economies while capturing opportunities for innovation and competitive action. In integrating the two views on agility of Goldman et al. (1994) and Sambamurthy et al. (2003), it can be viewed that customer agility parallels the dimension of inspiring the customer, partnering agility is the dimension of cooperating to compete, and operational agility line up with the dimensions of understanding change and increasing resources.

Lu and Ramamurthy (2011) recognized two types of organizational agility: market capitalizing agility and operational adjustment agility. *Market capitalizing agility* denotes to a company's capability to rapidly react to and capitalize on changes through continuously screening and quickly enhancing product/service to target customers' needs. This agility highlights a dynamic, aggressively change-

embracing, and growth-oriented entrepreneurial mindset about strategic approach and decision making in uncertainty conditions (Sambamurthy et al., 2003). *Operational adjustment agility* refers to a company's capability in its internal business processes to rapidly handle market or demand changes (Sambamurthy et al., 2003). This agility concentrates on flexible and quickly responding operations. Both types of agility involve a continual readiness to change, with concentrating on entrepreneurial mindset and highlighting fast implementation.

### **Fifth: Previous Studies and Hypotheses Development**

There are many previous studies that deals with the variables of the current research; those are business intelligence, absorptive capacity, and organization agility. The following sections will be illustrations of previous studies that indicate a relationship between two variables of the research.

#### **I. Studies related to Business Intelligence and Organization Agility**

A study of Chen and Siau (2011) indicates that there is a growing usage of business intelligence (BI) for better management decisions in different industries. However, empirical studies on BI are still scarce. In this research the authors study BI from an organizational agility perspective. Organizational agility is the ability to sense and respond to

market opportunities and threats with speed and BI can help the sensing part of organizational agility. Drawing on systems theory, dynamic capabilities framework, and literature on competitive performance, organizational agility, business intelligence, and IT infrastructure flexibility, they hypothesize that BI usage and IT infrastructure flexibility are two important sources for an organization's agility. They developed a research model to examine the effects of BI and IT infrastructure flexibility on organizational agility, which in turn affects an organization's competitive performance.

GhalichKhani and Hakkak (2016), this paper aims to examine the influence of business intelligence on organizational agility through Partial mediating variable Empowerment. The statistical population of the study is consisted of Tehran Construction Engineering Organization (TCEO) and ETKA Organization Industries co. 102 questionnaires have been distributed among managers and stakeholders of information systems and these have been analyzed via SPSS and Smart PLS software. Within this paper the business intelligence questionnaire, Sharifi& Zhang (2012) Organizational Agility and Spreitzer Empowerment have been used. The hypothesis of study is Business Intelligence has direct and indirect influence through empowerment on organizational agility. Secondary hypothesis seek to examine the impact of business intelligence on organizational agility, business intelligence on empowerment and examining the impact of empowerment on organizational agility.

Research studies imply the confirmation of study primary and secondary hypothesis.

Park et al. (2017), This research assesses the role that business intelligence (BI) and communication technologies play in how organizations may realize organizational sensing agility, decision making agility, and acting agility in different organizational and environmental fields. A total of 218 managers from 106 firms from different industries completed surveys; they delivered multiple responses from 47 firms. The firm-level response rate was 93%. The sampling method used, which depend upon personal contacts or interviews before applying the survey questionnaires, may clarify this high response rate. The findings propose equifinal paths to organizational agility and the specific boundary conditions of the middle-range theory that regulate what role of BI and communication technologies play in organizations' attaining organizational agility.

This study Cheng et al. (2020) draws on knowledge transformation as the theoretical lens for discovering how business intelligence influences organizational agility to encourage the speed of agility. By analyzing data collected from 258 Chinese organizations in the Yangtze River Delta area, Cheng (2020) found that: (1) Business intelligence has a significant impact on the speed of agility, and the organizational agility positively mediates such causal relationship. (2) Cultural distance

negatively moderates the relation between organizational agility and internationalization.

This empirical research of Chen and Siau (2020) is investigating the impact of business analytics (BA) and business intelligence (BI) use, IT infrastructure flexibility, and their interactions on organizational agility. Synthesizing the systems theory and awareness-motivation-capability framework, the authors propose that BA-Use, IT infrastructure flexibility, and their interactions significantly influence organizational agility. The results show the significant association of BA use and IT infrastructure flexibility with organizational agility. The results also suggest that BA use may demand corporations to build a more flexible IT infrastructure. However, the data does not reveal the proposed interaction between the two drivers of organizational agility.

From the above studies, the researchers could develop the following hypotheses:

**\*H<sub>1</sub>:** Technological BI Capabilities have significant positive effect on organization agility.

H<sub>11</sub>: Data source has significant positive effect on organization agility.

H<sub>12</sub>: Data type has significant positive effect on organization agility.

H<sub>13</sub>: Data reliability has significant positive effect on organization agility.

H<sub>14</sub>: System interaction has significant positive effect on organization agility.

H<sub>15</sub>: Accessibility has significant positive effect on organization agility.

\*H<sub>2</sub>: Organizational BI Capabilities have significant positive effect on organization agility.

H<sub>21</sub>: Flexibility has significant positive effect on organization agility.

H<sub>22</sub>: Risk tolerance has significant positive effect on organization agility.

H<sub>23</sub>: Staff has significant positive effect on organization agility.

H<sub>24</sub>: Structure and coordination has significant positive effect on organization agility.

## **II. Studies related to Business Intelligence and Absorptive Capacity**

Yeoh et al. (2013) stated that Business intelligence (BI) can help support decision-making processes and so contribute to improved BI assimilation and organizational performance. However, a BI undertaking may be effective and profitable for some organizations but not others. How can these differing outcomes be explained for those firms that have adopted BI systems? Drawing on the literature pertaining to absorptive capacity theory, IT competency, and BI assimilation we develop a conceptual framework to investigate the relationships between BI competency, absorptive capacity, and BI assimilation. This research provides insights for BI stakeholders in understanding the mediating role of organizational absorptive capacity within a complex BI environment, enabling many organizations that have implemented BI to leverage the benefits from their costly investments. The conceptual framework



provides a sound basis for further research to shed light on the effects of BI competency and organizational absorptive capacity on BI assimilation.

Owusu et al. (2017), This study explores the factors influencing the adoption of Business Intelligence Systems (BIS) in Higher Educational Institutions (HEIs), and also evaluate the extent of adoption in the universities. A research framework was developed based on the Technology-Organization-Environment (TOE) framework and the Diffusion of Innovations (DOI) theory, comprising of ten factors which were hypothesized and tested for the adoption of BIS in HEIs. Data was collected through a paper survey questionnaire from a sample of 120 managers and academicians in twelve private universities in Selangor State, Malaysia which were analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings revealed that Absorptive Capacity, Competitive Pressure, Complexity, IT Infrastructure, Presence of Champion, Top Management Support, and Vendor Selection, are the factors influencing BIS adoption in the universities. The results also indicate that most private universities in Malaysia are currently involved in level 2 of BIS adoption.

Wang and Byrd (2017), this study is Drawing on the resource-based theory and dynamic capability view, this paper aims to examine the mechanisms by which business analytics (BA) capabilities (i.e., the effective use of data aggregation, analytics, and data interpretation tools) in healthcare units indirectly influence decision-making effectiveness

through the mediating role of knowledge absorptive capacity. Using a survey method, this study collected data from the hospitals in Taiwan. Of the 155 responses received, three were incomplete, giving a 35.84% response rate with 152 valid data points. Structural equation modeling was used to test the hypotheses. This study conceptualizes, operationalizes, and measures the BA capability as a multi-dimensional construct that is formed by capturing the functionalities of BA systems in health care, leading to the conclusion that healthcare units are likely to obtain valuable knowledge through using the data analysis and interpretation tools effectively. The effective use of data analysis and interpretation tools in healthcare units indirectly influence decision-making effectiveness, an impact that is mediated by absorptive capacity.

Božič & Dimovski (2019), Based on the DeLone and McLean Information Systems (IS) success model and the knowledge-based theory of absorptive capacity, this study investigates the role of the business intelligence and analytics (BI&A) usage for improving a firm's absorptive capacity for knowledge creation. The researchers gathered data from an online and mail questionnaire with 97 respondents at the organizational level in the Slovenian medium- and large-sized organizations from numerous industries. The findings from the partial least squares SEM revealed that the BI&A usage significantly affect absorptive capacity enhancement, thus encouraging knowledge creation.

Dolmark et al. (2021), Absorptive capacity is a familiar obstacle to knowledge transfer at the operational level. Though, technology absorptive capacity can improve learning behavior of employees. This study examines that technology readiness, the tools for knowledge sources, social influences, and social networks impact an individual's absorptive capacity on an adjustment of learning behavior of employees. A quantitative approach is utilized to evaluate the existence of a causal relationship between the constructs of the study. Data were gathered from university students in Australia to investigate and test the hypotheses. With 199 responses, a partial least squares structural equation modelling approach was utilized for the analysis. The results showed mixed results. Individual's technological belief in confidence and innovation and social influences had a significantly lower impact on individual absorptive capacity, which sequentially had a significantly lower effect on their learning behavior.

From the above previous studies, the following hypotheses are developed:

**\*H<sub>3</sub>:** Technological BI Capabilities have significant positive effect on absorptive capacity

**\*H<sub>4</sub>:** Organizational BI Capabilities have significant positive effect on absorptive capacity

### **III. Studies related to Absorptive Capacity and Organization Agility**

Daspit and D'Souza (2019), This study collected data using a key informant approach with surveys administered to top managers of firms in the software industry. Given the focus of this study, senior business executives were selected to obtain unique perspectives on business-unit phenomena, and participants were asked to respond questions in the survey based on the primary business unit of the firm. A total of 152 respondents, the findings of this study suggest that the capabilities associated absorptive capacity are related in a manner similar to the relationships found organizational learning capabilities.

Sanchez and Leo (2019) This study investigated the mediating role of agility in the relationship between absorptive capacity and firm performance. Through collecting data from 231 Spanish firms, they discovered that agility has a positive mediating effect on the relationship between absorptive capacity and firm performance. Agile firms profits more from their efforts in absorptive capacity to enhance firm performance.

From the above previous studies, the hypothesis is developed as follows:

**\*H<sub>5</sub>:** Absorptive Capacity has a significant positive effect on organization BI agility

#### **IV. Studies indicated the mediating role of absorptive capacity**

The study of Felipe et al. (2016) indicated that Organizational agility (OA), as a key dynamic capability, is a firm's ability to enable sensing environmental changes and responding efficiently and effectively to them. This study explores this topic further by analyzing the part that the information systems capabilities (ISC) variable plays as an antecedent of OA, and absorptive capacity (AC) as a mediator construct. Furthermore, this study tests the negative moderating role of hierarchy culture (HC) in the AC–OA link. Using partial least squares (PLS) and the PROCESS macro, this work finds evidence of these relations proposed, and the existence of a conditional mediating situation that HC generates. In addition, the main model with direct effects (ISC and AC as predictors) achieves an appropriate level of predictive validity for the key endogenous construct (OA).

The researchers found a gap in literature related to the mediating role of absorptive capacity on the relationship between business intelligence and organization agility. Therefore, the researchers would like to contribute to literature and close the gap by investigating this relationship to see whether there is a positive relationship or there is no relationship between these constructs, hence, they develop the following hypotheses as follows:

**Technological business intelligence has a significant positive effect on organization agility mediated by absorptive capacity.**

**\*H<sub>6</sub>**

**Data source has significant positive effect on organization agility mediated by absorptive capacity.**

H<sub>61</sub>:

**Data type has significant positive effect on organization agility mediated by absorptive capacity.**

H<sub>62</sub>:

**Data reliability has significant positive effect on organization agility mediated by absorptive capacity.**

H<sub>63</sub>:

**System interaction has significant positive effect on organization agility mediated by absorptive capacity.**

H<sub>64</sub>:

**Accessibility has significant positive effect on organization agility mediated by absorptive capacity.**

H<sub>65</sub>:

**Technological business intelligence has a significant positive effect on organization agility mediated by absorptive capacity.**

**\*H<sub>7</sub>:**

**Flexibility has significant positive effect on organization agility mediated by absorptive capacity.**

H<sub>71</sub>

**Risk tolerance has significant positive effect on organization agility mediated by absorptive capacity.**

H<sub>72</sub>:

Staff has significant positive effect on organization agility mediated by absorptive capacity.

H<sub>73</sub>:

**Structure and coordination has significant positive effect on organization agility mediated by absorptive capacity.**

H<sub>74</sub>:

## **Sixth: Research Methodology**

### **6.1. Research Approach**

This research depends on the deductive approach which is concerned with “emerging a hypothesis (or hypotheses) rely on existing theory, and then designing a research strategy to examine the hypothesis”. A deductive design might examine if this relationship did attain more general conclusions”. Deductive approach can be clarified by hypotheses, which can be resulting from the theory’s propositions.

### **6.2. Techniques of Data Collection**

#### **6.2.1. Office Technique:**

This technique intends to gather secondary data from sources such as books references, reports, journals, and previous studies that are associated with research variables (technological business intelligence, organizational business intelligence, organizational agility, and absorptive capacity) for building the theoretical framework of the research.



### 6.2.2. Field Technique:

This technique intends to gather primary data through questionnaire organized for the purposes of the current study. This questionnaire will be directed to the sample selected randomly from employees at joint venture banks in Alexandria.

### 6.3. Research Variables and Measures

**Table (1) Research Variables and Coding**

Research Variables	Code	Questions	Scale
<b>Independent Variable (Technological Business Intelligence) X<sub>1</sub></b>			
Data Source	X <sub>11</sub>	1 – 6	<b>Işık et al., 2013</b>
Data Type	X <sub>12</sub>	7 – 12	
Data Reliability	X <sub>13</sub>	13 – 18	
System Interaction	X <sub>14</sub>	19 – 21	
Accessibility	X <sub>15</sub>	22 – 24	
<b>Independent Variable (Organizational Business Intelligence) X<sub>2</sub></b>			
Flexibility	X <sub>21</sub>	25 – 29	<b>Işık et al., 2013</b>
Risk Tolerance	X <sub>22</sub>	30 – 32	

Staff	X <sub>23</sub>	33 – 36	
Structure and Coordination	X <sub>24</sub>	37 – 39	
<b>Mediating Variable</b>			
Absorptive Capacity	M	40 - 55	Zahra and George,2002
<b>Dependent Variable</b>			
Organizational Agility	Y	56 – 67	Goldman et al., 1995 Tsourveloudis et al.,1999

#### **6.4. Research Population and Sample Size**

According to the data obtained from the central bank of Egypt, the total number of managers in middle and high-level management who are actually on the job in joint venture banks in Alexandria governorate is 651 managers distributed among 27 banks through 155 branches as shown in the following table:

**Table (2) Statistics of Numbers of Managers Working in Middle and High-Level Management in Joint Venture Banks in Alexandria Governorate**

<b>..</b>	<b>No. of branches</b>	<b>Area Manager</b>	<b>Branch manager</b>	<b>Vice Branch Manager</b>	<b>Customer Service Manager</b>	<b>Treasury Manager</b>	<b>Transaction Manager</b>	<b>Credit Manager</b>	<b>Total</b>
<b>Abu Dhabi Islamic Bank</b>	5	1	5	5	5	5	1	1	<b>23</b>
<b>Ahli Bank of Kuwait</b>	5	2	5	0	5	5	1	1	<b>19</b>
<b>Ahli United Bank</b>	5	1	5	5	5	5	3	3	<b>27</b>
<b>Arab Bank</b>	4	1	4	0	4	4	4	1	<b>18</b>
<b>Arab African International Bank</b>	8	1	8	8	8	8	2	2	<b>37</b>
<b>EG Bank</b>	4	1	4	4	4	4	1	0	<b>18</b>
<b>Export Bank of Egypt (EBE)</b>	5	1	5	5	5	5	2	3	<b>26</b>
<b>WAFA Bank</b>	8	3	8	0	0	0	8	4	<b>23</b>
<b>Arab International Bank</b>	1	0	1	1	1	1	1	0	<b>5</b>
<b>United Bank</b>	5	1	5	5	5	5	2	4	<b>27</b>
<b>National Bank of Greece</b>	3	1	3	3	3	3	0	0	<b>13</b>
<b>First Abu Dhabi Bank</b>	2	0	2	2	2	2	2	2	<b>12</b>
<b>HSBC</b>	6	1	6	0	6	6	3	0	<b>22</b>

<b>Abu Dhabi Commercial Bank</b>	4	1	4	4	4	4	2	3	<b>22</b>
<b>Arab Investment Bank</b>	2	1	2	2	2	2	2	4	<b>15</b>
<b>Baraka Bank</b>	4	1	4	4	4	4	4	4	<b>25</b>
<b>SAIIB Bank</b>	3	1	3	3	3	3	3	4	<b>20</b>
<b>National Bank of Kuwait</b>	5	1	5	4	4	5	2	3	<b>24</b>
<b>Mashreq Bank</b>	1	0	1	1	1	1	1	0	<b>5</b>
<b>Emirates NBD Bank</b>	10	3	10	0	2	10	10	2	<b>37</b>
<b>Arab Banking Corporation</b>	1	0	1	1	1	1	1	0	<b>5</b>
<b>Bloom Bank</b>	5	1	5	4	5	5	3	2	<b>25</b>
<b>Bank Audi</b>	6	1	6	6	6	6	3	4	<b>32</b>
<b>Misr Iran Development Bank</b>	1	0	1	1	1	1	1	0	<b>5</b>
<b>Commercial International Bank</b>	18	6	18	15	17	18	0	6	<b>80</b>
<b>Credit Agricole Bank</b>	13	1	13	0	0	0	0	0	<b>14</b>
<b>Qatar National Bank (QNB)</b>	21	4	21	0	21	0	21	5	<b>72</b>
<b>Total</b>	<b>155</b>	<b>35</b>	<b>155</b>	<b>83</b>	<b>124</b>	<b>113</b>	<b>83</b>	<b>58</b>	<b>65</b>
									<b>1</b>

The simple random sample formula (Mann, 1995) has been used to indicate the overall sample size of managers in joint venture banks in Alexandria governorate, the researcher distributed 242 questionnaires to the respondents, the researcher collected 231 valid respondents with a response rate of 94.2% with 14 invalid responses either incomplete or non-respondent questionnaires.

**Table (3) Sample size in each joint venture bank according to the population stated:**

Bank name	No . of branches	Area Manager	Branch manager	Vice Branch Manager	Customer Service Manager	Treasury Manager	Transaction Manager	Credit Manager	Total
Abu Dhabi Islamic Bank	5	1	1	1	1	1	1	1	7
Ahli Bank of Kuwait	5	1	1	0	1	1	1	1	6
Ahli United Bank	5	1	1	1	1	1	1	1	7
Arab Bank	4	1	1	0	1	1	1	1	6
Arab African International Bank	8	1	1	1	1	1	1	1	7
EG Bank	4	1	1	1	2	1	1	1	8
Export Bank of Egypt (EBE)	5	1	1	1	2	1	2	2	10
Wafa Bank	8	1	1	0	2	0	2	2	8
Arab International Bank	1	0	1	1	1	1	1	1	6
United Bank	5	1	1	1	1	1	1	1	7
National Bank of Greece	3	1	1	1	1	1	1	1	7
First Abu Dhabi Bank	2	0	1	1	1	1	1	1	6
HSBC	6	1	1	1	2	1	3	2	11
Abu Dhabi Commercial Bank	4	1	1	1	2	1	1	1	8

Arab Investment Bank	2	1	1	1	1	1	1	1	7
Baraka Bank	4	1	1	1	2	1	1	1	8
SAIB Bank	3	1	1	1	2	1	3	2	11
National Bank of Kuwait	5	1	1	1	1	1	1	1	7
Mashreq Bank	1	0	1	1	1	1	1	1	6
Emirates NBD Bank	10	1	1	1	2	2	4	3	14
Arab Banking Corporation	1	0	1	1	1	1	1	1	6
Bloom Bank	5	1	1	1	2	1	1	1	8
Bank Audi	6	1	1	1	2	3	1	1	10
Misr Iran Development Bank	1	0	1	1	1	1	1	1	6
Commercial International Bank	18	1	1	2	7	4	5	5	25
Credit Agricole Bank	13	1	1	1	3	2	1	1	10
Qatar National Bank (QNB)	21	1	1	2	4	2	5	5	20
Total	155	10	29	30	48	40	44	41	242

#### 6.4. Research Limitations

- The current research is limited to the joint venture banks in Alexandria only without studying the public banks as well due to

its large number of branches and its effect on the Egyptian banking sector.

- The current research is geographically limited to Alexandria governorate due to the difficulty in collecting data from banks located in other governorates in Egypt.
- The current research is limited to middle and high-level management only as they are responsible for taking strategic decisions related to sensitive data and long run plans.
- The current research concentrates on 5 dimensions of technological business intelligence and 4 dimensions of organizational dimensions only to affect organizational agility to give future research the chance to study other dimensions.

## **Seventh: Research Statistical Results and Hypotheses Testing**

### **7.1. Results of Reliability Analysis**

Scale Reliability was assessed using Test of Cronbach Alpha which is used to assess the internal consistency in order to match research results across and between items, Cronbach Alpha Coefficient is a satisfactory measure to assess the scale reliability. Alpha should be at least 0.7 (Hair et al., 2010) to achieve internal reliability as shown in table (4) coefficients of Cronbach Alpha were greater than 0.7 which verifies the existence of an internal consistency for the research items. Therefore, all scales' items will be analyzed statistically using structural

equation model (SEM) and there will be elimination of one item in data source that improved Cronbach Alpha from 0.768 to 0.803, one item deleted on data type that improved Cronbach Alpha from 0.752 to 0.754 and finally one item deleted on risk tolerance that improved Cronbach Alpha from 0.612 to 0.757

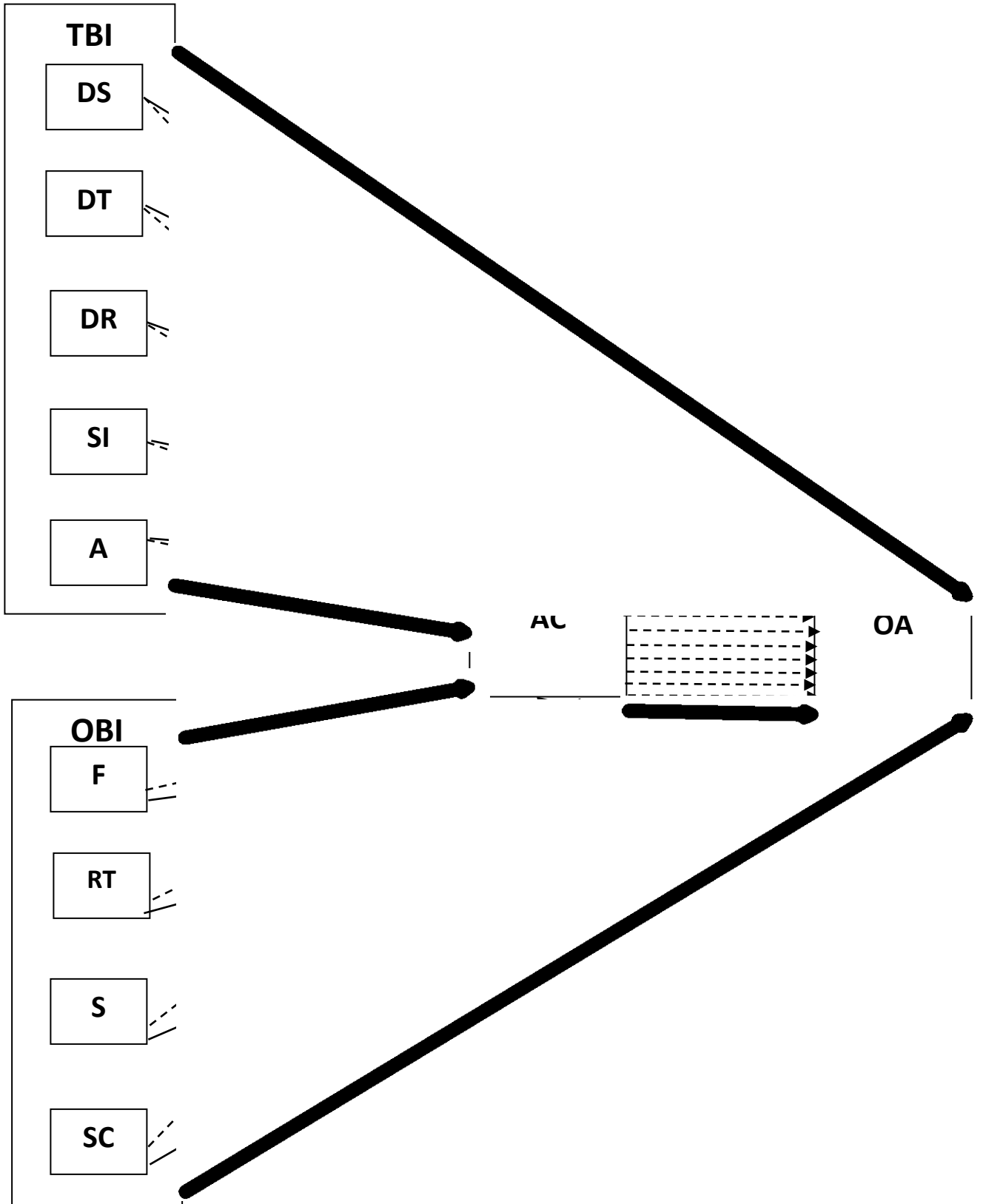
**Table (4) Reliability Analysis: Cronbach Alpha Coefficients**

<b>Research Variables</b>	<b>No. of Items</b>	<b>No of Items After Deletion</b>	<b>Alpha Coefficient</b>	<b>Alpha Coefficient after Deletion</b>
<b>Technological Business Intelligence (X1)</b>	<b>24</b>	<b>22</b>	<b>0.892</b>	<b>0.897</b>
• <b>Data Source</b>	<b>6</b>	<b>5</b>	<b>0.768</b>	<b>0.803</b>
• <b>Data Type</b>	<b>6</b>	<b>5</b>	<b>0.752</b>	<b>0.754</b>
• <b>Data Reliability</b>	<b>6</b>	<b>6</b>	<b>0.837</b>	<b>0.837</b>
• <b>System Interaction</b>	<b>3</b>	<b>3</b>	<b>0.734</b>	<b>0.734</b>
• <b>Accessibility</b>	<b>3</b>	<b>3</b>	<b>0.767</b>	<b>0.767</b>
<b>Organization Business Intelligence (X2)</b>	<b>15</b>	<b>14</b>	<b>0.909</b>	<b>0.910</b>
• <b>Flexibility</b>	<b>5</b>	<b>5</b>	<b>0.808</b>	<b>0.808</b>
• <b>Risk Tolerance</b>	<b>3</b>	<b>2</b>	<b>0.612</b>	<b>0.757</b>
• <b>Staff</b>	<b>4</b>	<b>4</b>	<b>0.758</b>	<b>0.758</b>
• <b>Structure and Coordination</b>	<b>3</b>	<b>3</b>	<b>0.783</b>	<b>0.783</b>
<b>Absorptive Capacity (M)</b>	<b>16</b>	<b>16</b>	<b>0.920</b>	<b>0.920</b>
<b>Organizational Agility (Y)</b>	<b>12</b>	<b>12</b>	<b>0.920</b>	<b>0.920</b>

## **7.2. Results of Structural Equation Modelling (SEM)**



### 7.2.1. Research Framework



**Where:**

TBI: Technological Business Intelligence	A: Accessibility
OBI: Organizational Business Intelligence	F: Flexibility
DS: Data Source	RT: Risk Tolerance
DT: Data Type	S: Staff
DR: Data Reliability	SC: Structure and coordination
SI: System Interaction	AC: Absorptive Capacity
	OA: Organizational Agility

**7.2.2. Structural Model Fitness**

The overall fitness indexes is Good of Fitness index (GFI) and we can use it to examine the validity or quality of pattern in general. This pattern acts as Lisrel model fitness indexes and varies between zero and one and values approaching to one suggest appropriate quality of model (Ringel et al., 2010). The index examines the overall prediction ability and whether tested model is effective in predicting endogenic variables or not. The research indicate absolute fitness index GFI obtained to be 0.926 and that the obtained value implies good fitness of tested patterns as indicated in the table below:

**Table (6) GFI**

0.452	AC.	Squared Multiple Correlations (R <sup>2</sup> )	CMIN/DF = 2.830	Research Model Fit Summary
0.499	O.A.			
			GFI = .926	
			NFI = .937	
			TLI = .943	
			CFI = .944	
			RMSEA = .071	

The above table shows the GFI of the model, which is 0.926, therefore the model is effective in predicting the endogenic variables in a more accurate manner.

### **7.2.3. Hypotheses Testing Results**

#### **1. The First hypothesis:**

The first main hypothesis ( $H_1$ ) examines the direct effect of technological business intelligence on organization agility in joint venture banks in Alexandria, the hypothesis is formulated depending on studies of (Watson 2009; Foley and Guillemette, 2010; Chen and Siau, 2012; Wang, 2016; Asmus, 2019) as follows:

**\* $H_1$ :** technological BI capabilities have significant positive effect on organization agility.

$H_{11}$ : Data source has significant positive effect on organization agility.

$H_{12}$ : Data type has significant positive effect on organization agility.

$H_{13}$ : Data reliability has significant positive effect on organization agility.

$H_{14}$ : System interaction has significant positive effect on organization agility.

$H_{15}$ : Accessibility has significant positive effect on organization agility.

#### **Table (7) SEM Results Related to The Effect of Technological Business Intelligence on Organizational Agility**

Variable	St. Beta	T. Value (CR)	Sig.	Decision	Rank
TBI → OA	0.013	0.351	0.103	No significant effect Reject H <sub>1</sub>	
DS → OA	0.353	2.237	0.001	Significant Positive effect Accept H <sub>11</sub>	2
DT → OA	0.280	3.014	0.001	Significant positive effect Accept H <sub>12</sub>	1
DR → OA	0.161	1.630	0.008	No significant effect Reject H <sub>13</sub>	X
SI → OA	0.033	0.770	0.380	No significant effect Reject H <sub>14</sub>	X
A → OA	0.092	0.571	0.220	No significant effect Reject H <sub>15</sub>	X

**The above table shows the following results:**

Technological business intelligence capabilities refer to “shareable technical platforms and databases that ideally include a well-defined technology architecture and data standards” (Hostmann et al., 2007; Işık et al., p. 15). Technological business intelligence has no significant effect on organizational agility (T. Value = 0.351, St. Beta = 0.013), therefore, the hypothesis (H1) is rejected according to its P value. Technological business intelligence has no direct effect on organizational agility; it is obvious by literature that organizations are disposed to participate the technological business intelligence at large scale, but more than 70% fail to bring the anticipated consequences (Ahmed et al., 2020). As mentioned in literature, technology business intelligence denotes to activities in which, through collection, analysis, and distribution of relevant information, generates a timely understanding of technological trends regarding (threats and opportunities) outside an organization and, thus,

supports decision-making and planning processes towards technological issues.

With respect to the dimensions of technological business intelligence taken into consideration during the current research and according to statistical analysis shown in the above table, the following results prone to be:

The results show a significant positive effect of data source on the organization agility (T. value = 2.237, St. Beta = .353) thus, sub-hypothesis (H<sub>11</sub>) is accepted. Organizations can obtain data either from internal or external sources (Chen and Siau, 2016; Park et al., 2017). Internal data could be from sources like data warehouses, or data marts, from which data created in internal systems such as transactional systems in banks (Hostmann et al., 2007), on the other hand, external data could be obtained from sources outside the firm (Işık et al., 2013; Mohammadi and Hajiheydari, 2012; Van Oosterhout et al., 2006). The sub-hypothesis is accepted because strategic decisions rely on either internal or external data sources, however high-level decisions need more external data rather than internal one because these decisions incline to concentrate more on external contexts (Van Oosterhout et al., 2006).

The results related to data type show a significant positive effect of data type on the organization agility (T. value = 3.014, St. Beta = 0.280) thus, sub-hypothesis (H<sub>12</sub>) is accepted. Data type comes first in its direct impact on organization agility. The data type is the “nature of the data”

(Işık et al., 2013, p. 39), and data types have two main groups either (a) numerical or nonnumerical or (b) dimensional or nondimensional. Numerical data denote to any data that can be assessed, especially via statistical tools (Işık et al., 2013). Nonnumerical data are warehoused in setups that cannot be numerically assessed such as text or video (Işık et al., 2013; Mohammadi and Hajiheydari, 2012).

Regarding the results of data reliability, it shows non-significant effect of data reliability on the organization agility (T. value = 1.630, St. Beta = 0.161) thus, sub-hypothesis ( $H_{13}$ ) is rejected. According to Chaudhuri et al., (2011), data quality is very important for organizations to emphasizes data reliability. However, organizations use uncontrolled sources of information to get data for their databases which can contain errors and misleading data that can affect business intelligence and as well organization agility in making strategic decisions and get ready for any change happens in the surrounded environment (Başkarada and Koronios, 2018; Hostmann et al., 2007; Işık et al., 2013).

The results of system interaction show non-significant effect of system interaction on organization agility (T. value = 0.770, St. Beta = 0.033) thus, sub-hypothesis ( $H_{14}$ ) is rejected. The reason behind this result is that for many organizations is to get an information system model that attaches the system integration with multiple managerial levels within the organization. Rutz et al. (2012) and Bogdan (2015) distinguished that organizations work in rapidly changing environments

need rapid as well as informed decision-making system and benefit from the information available. Because of the huge information volume and due to its complexity, managers face growing challenges (Bogdan, 2015; Rutz et al., 2012).

Finally, the last dimension of technological business intelligence, accessibility shows insignificant effect on organizational agility (T. value = 0.351, St. Beta = 0.013) thus, sub-hypothesis (H<sub>15</sub>) is rejected. Determining the suitable employee access must be considered as governance, such as different information security laws and regulations required to defend the organization (Chen et al., 2012). Business intelligence manipulators vary in their access levels needed to get data and enter organization's information system alike. Banks select to limit frontline managers' access to just their individual work or permit them to realize their teams' data as well, on the other hand, experts need access to all facets of organization's data and system to get different requirements and needs. Therefore, accessibility with different facets to different users in the organization do not allow the achievement of organization agility to all managerial levels in a constant manner due to their limited access to the bank system.

## **2. The Second Hypothesis:**

The second main hypothesis (H<sub>2</sub>) examines the direct effect of organizational business intelligence on organization agility in joint

venture banks in Alexandria, the hypothesis is formulated depending on studies of (Chen and Siau, 2011, 2016; Park et al., 2017; Walker and Cheek, 2018) as follows:

**\*H<sub>2</sub>**: organizational BI capabilities have significant positive effect on organization agility.

H<sub>21</sub>: Flexibility has significant positive effect on organization agility.

H<sub>22</sub>: Risk tolerance has significant positive effect on organization agility.

H<sub>23</sub>: Staff has significant positive effect on organization agility.

H<sub>24</sub>: Structure and coordination has significant positive effect on organization agility.

**Table (8) SEM Results Related to The Effect of Organizational Business Intelligence on Organizational Agility**

Variable	St. Beta	T. Value (CR)	Sig.	Decision	Rank
OBI → OA	0.422	4.754	0.000	Significant positive effect Accept H <sub>2</sub>	
F → OA	0.418	4.255	0.002	Significant positive effect Accept H <sub>21</sub>	3
RT → OA	0.221	4.754	0.002	Significant positive effect Accept H <sub>22</sub>	2
S → OA	0.167	5.425	0.005	Significant positive effect Accept H <sub>23</sub>	1
SC → OA	0.071	0.378	0.173	No significant effect Reject H <sub>24</sub>	X

**The above table shows the following results:**

Organizational business intelligence is “the combined knowledge and skills regarding both tangible and intangible assets that the



organization can deploy to achieve its goals” (Hostmann et al., 2007, p68). The second main hypothesis ( $H_2$ ) is accepted as indicated in the above table (T value = 4.754, St. Beta = 0.422) where there is a significant positive effect of organizational business intelligence on organization agility in private joint venture banks in Alexandria. Banks are using their employees’ skills and knowledge to achieve their goals and be more agile to increase their ability to quickly respond to changes in the environment.

Organizational business intelligence capabilities grouped as flexibility, structure and coordination, staff, and risk tolerance (Hostmann et al., 2007; Işık et al., 2013; Mohammadi and Hajiheydari, 2012), so, the use and worth of these capabilities differ from organization to another (Işık et al., 2013; Watson and Wixom, 2007). However, their significance to business intelligence success is unrelatedly to any differences between organizations (Hostmann et al., 2007; Işık et al., 2013; Mohammadi and Hajiheydari, 2012). Therefore, considerate their emphasis on business intelligence success within decision making process is very important.

Regarding the sub-hypothesis ( $H_{21}$ ), the results revealed that (T. value = 4.255, St. Beta = 0.418) which means that there is a significant positive effect on organizational agility, therefore, accepting the sub-hypothesis ( $H_{21}$ ). Flexibility is considered as a key factor in decision-making (Schober and Gebauer, 2011); as well, it is a vigorous resource which helps organizations adjust to rapidly changing environments

(Larson and Chang, 2016). Business intelligence capabilities must support organizations' predominant goals to respond to possible future changes (Işık et al., 2013; Schober and Gebauer, 2011). The current research considered flexibility as one of the organizational business intelligence capabilities because of its direct association with organization agility.

The results also show a significant effect of risk tolerance on organization agility (T. value = 4.754, St. Beta = 0.221), therefore, accepting the sub-hypothesis (H<sub>22</sub>). In decision making process and in any aspect of life there is a risk that could affect businesses (Hsu et al., 2014). Managers must comprehend the variables that emphasize the process of decision making (Smith, 2015). Therefore, risk tolerance stages are exclusive for each organization, so, managers must apply business intelligence keys that are appropriate to their risk level (Hostmann et al., 2007; Işık et al., 2013). Risk could be derived internally or externally (Hsu et al., 2014), and the business intelligence system can aid organizations either alleviate or increase their risk levels related to high returns (Mohammadi and Hajiheydari, 2012).

For staff as a dimension of organization business intelligence, the results show a significant positive effect of staff on organization agility (T. value = 5.425, St. Beta = 0.167), therefore, accepting the sub-hypothesis (H<sub>23</sub>). staff refers to “all those individuals within organization who use business intelligence as part of their job functions. BI initiatives

are considered to be knowledge intensive and require technical, business, managerial and entrepreneurial skills and knowledge” (Watson and Wixom, 2007). People are the main driver for organization success; therefore, staff is important for the success of applying business intelligence aspects.

Finally, the results reveal a non-significant effect of structure and coordination on organization agility (T. value = 0.378, St. Beta = 0.071), therefore, rejecting the sub-hypothesis (H<sub>24</sub>). Organizational structure and coordination is one of the important organizational factors that establishes a business intelligence systems’ success. Organizational structure is defined as the pattern of relationships, authority and internal communication among members and tasks (Ariail et al., 2015). They stated that decentralized structure ensures agility in decision-making process, stability in external environmental changes and higher organization agility. the current research found a non-significant link between decentralized organizational structure and its organization agility.

### **3. The Third Hypothesis**

The third main hypothesis (H<sub>3</sub>) examines the direct effect of technological business intelligence on absorptive capacity in joint venture banks in Alexandria, the hypothesis is formulated depending on studies of (Malhotra et al., 2005; Wang and Ahmed, 2007; Yeoh et al., 2013; Zahra and George, 2002) as follows:

**\*H<sub>3</sub>:** Technological BI capabilities have significant positive effect on absorptive capacity.

**Table (9) SEM Results Related to The Effect of Technological Business Intelligence on Absorptive Capacity**

Variable	St. Beta	T. Value (CR)	Sig.	Decision
TBI → AC	0.721	2.840	0.000	Significant positive effect Accept H <sub>3</sub>

The above table shows that technological business intelligence has a significant effect on absorptive capacity (T. value = 2.840, St. Beta = 0.721); thus, accepting the hypothesis (H<sub>3</sub>). Cohen and Levinthal (1990, p. 128) theorized a firm’s absorptive capacity as “the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to a commercial end.” Absorptive capacity, therefore, permits an organization to recognize external knowledge then, assimilate and integrate that knowledge with the internal knowledge that already existed in the organization. Prior studies have shown that absorptive capacity's capabilities of external knowledge are acquisition and assimilation which is called potential absorptive capacity, as well as transformation to new knowledge and exploitation are called realized absorptive capacity; the two absorptive capacity types are important component of dynamic capabilities (Malhotra et al., 200; Zahra and George, 2002; Mohammadi and Hajiheydari, 2012).

#### 4. The Fourth Hypothesis

The fourth main hypothesis ( $H_4$ ) examines the direct effect of organizational business intelligence on absorptive capacity in joint venture banks in Alexandria, the hypothesis is formulated depending on studies of (Malhotra et al., 2005; Zahra and George, 2002; Işık et al., 2013) as follows:

**\* $H_4$ :** Organizational BI capabilities have significant positive effect on absorptive capacity.

**Table (10) SEM Results Related to The Effect of Organizational Business Intelligence on Absorptive Capacity**

Variable	St. Beta	T. Value (CR)	Sig.	Decision
OBI → AC	0.879	10.228	0.000	Significant positive effect Accept $H_4$

The above table revealed that there is a significant positive effect of organizational business intelligence on absorptive capacity (T. value = 10.228, St. Beta = 0.879), so, accepting the hypothesis ( $H_4$ ). Business intelligence is mainly regarded as an information tool that provides knowledge infrastructure capabilities, which improve an organization's existing knowledge base, and in turn enhancing organizational absorptive capacity (Mousannif et al., 2016). Moreover, organizational business intelligence facilitates knowledge gaining by identifying, collecting, and analyzing external data and information and transforming them internally

to build a good managerial knowledge base. Also, business intelligence helps the distribution and reuse of the transformed knowledge to support the improvement of business decision-making processes (Chaudhuri et al., 2011). The knowledge transmission across different departments allow intra-organizational knowledge streams and knowledge merging (Thamir and Poulis, 2015), in which it increases both the individual knowledge base and the overall organizational knowledge base (Thamir and Poulis, 2015).

### 5. The Fifth Hypothesis

The fifth main hypothesis (H<sub>5</sub>) examines the direct effect of organizational business intelligence on absorptive capacity in joint venture banks in Alexandria, the hypothesis is formulated depending on studies of (Zahra and George, 2002; Malhotra et al., 2005; Barret et al., 2008; Roberts, 2015; Liu et al., 2013) as follows:

**\*H<sub>5</sub>:** Absorptive capacity has a significant positive effect on organization agility.

**Table (11) SEM Results Related to The Effect of Absorptive Capacity on Organization Agility**

Variable	St. Beta	T. Value (CR)	Sig.	Decision
AC → OA	0.948	7.393	0.000	Significant positive effect Accept H <sub>5</sub>

The results show that there is a significant positive effect of absorptive capacity on organization agility (T. value = 7.393, St. Beta =

0.948), therefore, accepting the hypothesis (H<sub>5</sub>). Consistent with prior research, the current study interpretes absorptive capacity as “a set of organizational routines and processes by which firms acquire, assimilate, transform and exploit knowledge to produce a dynamic organizational capability” (Zahra and George, 2002, p. 186). Studies built on dynamic capability theories emphasize on theoretical explanations of absorptive capacity outcomes, such as organization innovation, flexibility, and agility. To identify the role of absorptive capacity, absorptive capacity and organizational agility are associated as two dynamic capabilities (Roberts, 2015). Therefore, absorptive capacity has satisfactory illustrative power in this research to explain the organizational abilities of responding to change. Organizational agility focuses on managing responses, whereas absorptive capacity refers to managing knowledge (Overby et al., 2006). Liu et al. (2013) also indicated that organization agility can be enhanced by absorptive capacity.

## **6. The Sixth Hypothesis**

The sixth main hypothesis (H<sub>6</sub>) examines the indirect effect of technological business intelligence on organization agility mediated by absorptive capacity in joint venture banks in Alexandria, the hypothesis is formulated depending on studies of (Asmus, 2019; Malhotra et al., 2005; Zahra and George, 2002) as follows:

**\*H<sub>6</sub>:** Technological business intelligence has a significant positive effect on organization agility mediated by absorptive capacity.

H<sub>61</sub>: Data source has significant positive effect on organization agility mediated by absorptive capacity.

H<sub>62</sub>: Data type has significant positive effect on organization agility mediated by absorptive capacity.

H<sub>63</sub>: Data reliability has significant positive effect on organization agility mediated by absorptive capacity.

H<sub>64</sub>: System interaction has significant positive effect on organization agility mediated by absorptive capacity.

H<sub>65</sub>: Accessibility has significant positive effect on organization agility mediated by absorptive capacity.

**Table (12) SEM Results Related to The Effect of Technological Business Intelligence on Organizational Agility Mediated by Absorptive Capacity**

Variable	St. Beta	Sig	Rank	Decision
TBI → AC → OA	0.892	0.001		Significant positive effect Accept H <sub>6</sub>
DS → AC → OA	0.511	0.005	3	Significant positive effect Accept H <sub>61</sub>
DT → AC → OA	0.430	0.005	4	Significant positive effect Accept H <sub>62</sub>
DR → AC → OA	0.712	0.001	1	Significant positive effect Accept H <sub>63</sub>
SI → AC → OA	0.077	0.345	X	Non-significant effect Reject H <sub>64</sub>
A → AC → OA	0.551	0.005	2	Significant positive effect Accept H <sub>65</sub>



**The above table shows the following results:**

- Technological business intelligence has a significant positive effect on organization agility mediated by absorptive capacity (St. Beta = 0.892 with  $P \leq 0.001$ ). which indicate a fully mediating role of absorptive capacity in this relationship. Thus, accepting the main hypothesis ( $H_6$ ).
- Results also indicated a significant positive effect of data source on organization agility mediated by absorptive capacity (St. Beta = 0.511 with  $P \leq 0.005$ ), so, accepting the sub-hypothesis ( $H_{61}$ ). This result indicated a partial mediating role of absorptive capacity in this relationship.
- Related to data type, there is a significant effect on organization agility mediated by absorptive capacity (St. Beta = 0.430 with  $P \leq 0.005$ ). which indicate a partial mediating role of absorptive capacity in this relationship. Thus, accepting the sub-hypothesis ( $H_{62}$ )
- Data reliability has a significant positive effect on organization agility mediated by absorptive capacity (St. Beta = 0.712 with  $P \leq 0.001$ ). which indicate a fully mediating role of absorptive capacity in this relationship. Thus, accepting the sub-hypothesis ( $H_{63}$ ).

- With respect to system interaction, has a non-significant effect on organization agility mediated by absorptive capacity (St. Beta = 0.077, with  $P = 0.345$ ). which indicate a no mediating role of absorptive capacity in this relationship. Thus, rejecting the sub-hypothesis (H<sub>64</sub>).
- Finally, accessibility has a significant positive effect on organization agility mediated by absorptive capacity (St. Beta = 0.551 with  $P \leq 0.005$ ). which indicate a fully mediating role of absorptive capacity in this relationship. Thus, accepting the sub-hypothesis (H<sub>65</sub>).

There is a fully mediating effect of absorptive capacity in the relationship between technological business intelligence and organization agility. Full mediation is indicated by three main indicators; first, there is no significant effect between technological business intelligence and organization agility (the direct relation H1). Second, a significant positive effect between absorptive capacity and organization agility (H3). Finally, the existence of absorptive capacity (mediator) made the relationship between technological business intelligence and organization agility significant. So, it can be said that absorptive capacity is a fully mediator variable.

## **7. The Seventh Hypothesis**

The seventh main hypothesis (H<sub>7</sub>) examines the indirect effect of organizational business intelligence on organization agility mediated by absorptive capacity in joint venture banks in Alexandria, the hypothesis is formulated depending on studies of (Asmus, 2019; Zahra and George, 2002) as follows:

**\*H<sub>7</sub>: Organizational business intelligence has a significant positive effect on organization agility mediated by absorptive capacity.**

**H<sub>71</sub>: Flexibility has significant positive effect on organization agility mediated by absorptive capacity.**

**H<sub>72</sub>: Risk tolerance has significant positive effect on organization agility mediated by absorptive capacity.**

**H<sub>73</sub>: Staff has significant positive effect on organization agility mediated by absorptive capacity.**

**H<sub>74</sub>: Structure and coordination has significant positive effect on organization agility mediated by absorptive capacity.**

**Table (13) SEM Results Related to The Effect of Organizational Business Intelligence on Organizational Agility Mediated by Absorptive Capacity**

Variable	St. Beta	Sig.	Rank	Decision
OBI → AC → OA	0.563	0.000		Significant positive effect Accept H <sub>7</sub>
F → AC → OA	0.431	0.000	1	Significant positive effect Accept H <sub>71</sub>
RT → AC → OA	0.581	0.003	4	Significant positive effect Accept H <sub>72</sub>
S → AC → OA	0.513	0.002	2	Significant positive effect Accept H <sub>73</sub>
SC → AC → OA	0.491	0.005	3	Significant positive effect Accept H <sub>74</sub>

**The above table shows the following results:**

- Organizational business intelligence has a significant positive effect on organization agility mediated by absorptive capacity (St. Beta = 0.563 with  $P \leq 0.001$ ). which indicate a partial mediating role of absorptive capacity in this relationship. Thus, accepting the main hypothesis (H<sub>7</sub>).
- Results also indicated a significant positive effect of flexibility on organization agility mediated by absorptive capacity (St. Beta = 0.431 with  $P \leq 0.001$ ), so, accepting the sub-hypothesis (H<sub>71</sub>). This result indicated a partial mediating role of absorptive capacity in this relationship.
- Related to risk tolerance, there is a significant positive effect on organization agility mediated by absorptive capacity (St. Beta = 0.581 with  $P \leq 0.005$ ). which indicate a partial mediating role of absorptive capacity in this relationship. Thus, accepting the sub-hypothesis (H<sub>72</sub>)
- Staff has a significant positive effect on organization agility mediated by absorptive capacity (St. Beta = 0.513, with  $P \leq 0.005$ ). which indicate a partial mediating role of absorptive capacity in this relationship. Thus, accepting the sub-hypothesis (H<sub>73</sub>).

- With respect to structure and coordination, has a significant positive effect on organization agility mediated by absorptive capacity (St. Beta = 0.491 with  $P \leq 0.005$ ). which indicate a fully mediating role of absorptive capacity in this relationship. Thus, accepting the sub-hypothesis (H<sub>74</sub>).

There is a mediating effect of absorptive capacity in the relationship between organizational business intelligence and organization agility. mediation is indicated by three main indicators; first, there is a significant effect between organizational business intelligence and organization agility (the direct relation H<sub>2</sub>). Second, a significant positive effect between absorptive capacity and organization agility (H<sub>3</sub>). Finally, the existence of absorptive capacity (mediator) enhance the relationship between organizational business intelligence and organization agility. So, it can be said that absorptive capacity is a partially mediator variable.

**Table (14) Direct, Indirect and Total Effects of Research Variables:**

Effect	St. Beta	Sig.
<b><u>Direct Effect</u></b>		
DS → OA	0.353	***
DT → OA	0.280	*
DR → OA	0.161	XXX
SI → OA	0.033	XXX
A → OA	0.092	XXX
F → OA	0.418	*
RT → OA	0.221	*
S → OA	0.167	*

SC → OA	0.071	XXX
TBI → AC	0.721	***
OBI → AC	0.879	***
AC → OA	0.948	***
TBI → OA	0.013	XXX
OBI → OA	0.422	***
DS → AC	0.671	***
DT → AC	0.512	***
DR → AC	0.737	***
SI → AC	0.733	***
A → AC	0.923	***
F → AC	0.735	***
RT → AC	0.804	***
S → AC	0.908	***
SC → AC	0.871	***
<b><u>Indirect Effects</u></b>		
DS → OA	0.511	*
DT → OA	0.430	*
DR → OA	0.712	***
SI → OA	0.077	XXX
A → OA	0.551	*
F → OA	0.431	***
RT → OA	0.581	*
S → OA	0.513	*
SC → OA	0.491	*
TBI → OA	0.892	*
OBI → OA	0.563	***
<b><u>Total Effects (Direct + Indirect)</u></b>		
TBI → AC → OA	0.905	***
OBI → AC → OA	0.985	***
DS → AC → OA	0.864	*
DT → AC → OA	0.710	*
DR → AC → OA	0.873	*
SI → AC → OA	0.110	XXX
A → AC → OA	0.643	*
F → AC → OA	0.849	***

RT → AC → OA	0.802	*
S → AC → OA	0.680	*
SC → AC → OA	0.562	*
XXX = not significant * P ≤ 0.005, *** P ≤ 0.001		

According to the previous table:

Technological business intelligence has a significant positive indirect effect on organizational agility through absorptive capacity. According to the statistical results, this indirect effect increases the standardized effect of technological business intelligence from 0.013 to 0.905. Additionally, organizational business intelligence has a significant positive indirect effect on organization agility through absorptive capacity. In the light of the statistical result, this indirect impact increases the standardized effect of organizational business intelligence from 0.422 to 0.985.

Absorptive capacity has a significant positive direct effect on organization agility, the statistical analysis shows that the standardized effect of absorptive capacity is 0.948.

According to the dimensions of technological business intelligence, first, data source (DS) it has been found it has a significant indirect impact on organization agility that the existence of absorptive capacity as a mediator increases its standardized effect from 0.353 to 0.864. Second, data type (DT) has been found it has a significant indirect impact on organization that the existence of absorptive capacity as a

mediator turns the relationship to be significant indirect effect from 0.280 to 0.710. Third, data reliability (DR) has been found that it has a significant indirect impact on organization that the existence of absorptive capacity as a mediator turns the relationship to be significant indirect effect from 0.161 to 0.873. Fourth, system interaction (SI) has a non-significant indirect effect on organization agility with standardized effect of 0.110. Finally, accessibility (A) has been found that it has a significant indirect impact on organization that the existence of absorptive capacity as a mediator turns the relationship to be significant indirect effect from 0.092 to 0.643.

According to the dimensions of organizational business intelligence, first, flexibility (F) it has been found it has a significant indirect impact on organization that the existence of absorptive capacity as a mediator increases its standardized effect from 0.418 to 0.849. Second, risk tolerance (RT) has a significant positive indirect effect and with the existence of absorptive capacity the relationship become more significant from 0.221 to 0.802. Third, staff (S) has been found it has a significant indirect impact on organization that the existence of absorptive capacity as a mediator turns the relationship to be significant indirect effect from 0.167 to 0.680. Finally, structure and coordination (SC) has been found it has a significant indirect impact on organization that the existence of absorptive capacity as a mediator turns the relationship to be significant indirect effect from 0.071 to 0.562.



#### **7.2.4. Summary of Research Results**

The current research results showed the first main hypothesis (H<sub>1</sub>) which investigates the direct effect of the technological business intelligence on organization agility was not supported. The sub-hypotheses related to the main hypothesis showed the following results:

- Data source (H<sub>11</sub>) has a significant positive effect on organization agility in joint venture banks in Alexandria. This sub-hypothesis is supported.
- Data type (H<sub>12</sub>) has a significant positive effect on organization agility in joint venture banks in Alexandria. This sub-hypothesis is supported.
- Data reliability (H<sub>13</sub>) has a non-significant effect on organization agility in joint venture banks in Alexandria. This sub-hypothesis is supported.
- System interaction (H<sub>14</sub>) has a non-significant effect on organization agility in joint venture banks in Alexandria. This sub-hypothesis is rejected.
- Accessibility (H<sub>15</sub>) has a non-significant effect on organization agility in joint venture banks in Alexandria. This sub-hypothesis is rejected.

With respect to the second main hypothesis ( $H_2$ ) that examines the direct effect of organizational business intelligence on organization agility, the findings revealed a significant positive effect, and the hypothesis is statistically supported. There are four dimensions that are being formulated in sub-hypotheses as follows:

- Flexibility ( $H_{21}$ ) has a significant positive effect on organization agility in joint venture banks in Alexandria. This sub-hypothesis is supported.
- Risk tolerance ( $H_{22}$ ) has a significant negative effect on organization agility in joint venture banks in Alexandria. This sub-hypothesis is supported.
- Staff ( $H_{23}$ ) has a significant positive effect on organization agility in joint venture banks in Alexandria. This sub-hypothesis is supported.
- Structure and coordination ( $H_{24}$ ) has a non-significant effect on organization agility in joint venture banks in Alexandria. This sub-hypothesis is rejected.

Related to the third hypothesis ( $H_3$ ) that examines the direct effect of technological business intelligence on absorptive capacity in joint venture banks in Alexandria, the results show that there is a significant positive effect, so, the third hypothesis is strongly supported.

Related to the fourth hypothesis (H4) that examines the direct effect of organizational business intelligence on absorptive capacity in joint venture banks in Alexandria, the results show that there is a significant positive effect, so, the fourth hypothesis is strongly supported.

Regarding the fifth main hypothesis (H5), that examines the direct effect of absorptive capacity on organization agility in joint venture banks in Alexandria, the statistics revealed a significant positive effect; thus, the fifth hypothesis is strongly supported.

The sixth hypothesis (H6) investigates the mediating role of absorptive capacity on the relationship between technological business intelligence and organization agility. the results indicated that there is a full mediation effect of absorptive capacity on the relationship between technological business intelligence and organization agility, so, the sixth hypothesis is strongly supported. The technological business intelligence dimensions are examined in the five sub-hypotheses and the results are as follows:

- Data source (H<sub>61</sub>) has a significant positive effect on organization agility mediated by absorptive capacity in joint venture banks in Alexandria. The sub-hypothesis is accepted.
- Data type (H<sub>62</sub>) has a significant effect on organization agility mediated by absorptive capacity in joint venture banks in Alexandria. The sub-hypothesis is accepted.

- Data reliability (H<sub>63</sub>) has a significant positive effect on organization agility mediated by absorptive capacity in joint venture banks in Alexandria. The sub-hypothesis is accepted.
- System interaction (H<sub>64</sub>) has a non-significant effect on organization agility mediated by absorptive capacity in joint venture banks in Alexandria. The sub-hypothesis is rejected.
- Accessibility (H<sub>65</sub>) has a significant positive effect on organization agility mediated by absorptive capacity in joint venture banks in Alexandria. The sub-hypothesis is accepted.

Finally, the seventh hypothesis (H7) examines the indirect effect of organizational business intelligence on organization agility mediated by absorptive capacity in joint venture banks in Alexandria, the hypothesis is accepted and there is a partial mediating role of absorptive capacity. The sub-hypotheses investigate the dimensions of organizational business intelligence and results are as follows:

- Flexibility (H<sub>71</sub>) has a significant positive effect on organization agility mediated by absorptive capacity in joint venture banks in Alexandria. This sub-hypothesis is supported.
- Risk tolerance (H<sub>72</sub>) has a significant negative effect on organization agility mediated by absorptive capacity in joint venture banks in Alexandria. This sub-hypothesis is supported.

- Staff (H<sub>73</sub>) has a significant positive effect on organization agility mediated by absorptive capacity in joint venture banks in Alexandria. This sub-hypothesis is supported.
- Structure and coordination (H<sub>74</sub>) has a significant positive effect on organization agility mediated by absorptive capacity in joint venture banks in Alexandria. This sub-hypothesis is supported.

## **8. Research Implications and Future Research**

In this section, the researcher discusses the theoretical and practical implications of the study. Finally, the researcher will indicate research limitations and future recommendations for further research.

### **Theoretical Implications:**

The current research contribute to the literature of business intelligence, absorptive capacity, and organization agility; therefore, the research has a number of theoretical implications by adding to the literature a new stream of knowledge that have not been previously examined and tried to close a specific gap in the literature of business intelligence, absorptive capacity, and organization agility.

**First**, the framework developed in this study measured the effects of organizational and technological business intelligence capabilities on organization agility. The findings revealed that there is a significant direct effect of organizational business intelligence on organization agility while there is no significant direct effect of technological business

intelligence on organization agility. The current study highlights the importance of certain dimensions such as data type, data source and data reliability in technological business intelligence and the importance of flexibility, staff, and risk tolerance levels in affecting organization agility.

**Second**, the current findings differ from Chen et al., 2012 by addressing the complicated role of absorptive capacity. On the one hand, the findings support a direct link between absorptive capacity and organization agility and prove that there is a significant positive effect in organization agility. On the other hand, absorptive capacity increases organization agility, as it fully mediates the effect of technological business intelligence on organization agility. Absorptive capacity also partially mediates the effects of organizational business intelligence on organization agility. These findings suggest that different technological and organizational business intelligence dimensions distinctly shape organizational agility via absorptive capacity. Hence, utilizing absorptive capacity deepens the understanding of the direct and indirect effects of organizational agility.

**Third**, the insignificance direct effect of technological business intelligence on organization agility may be reasonable because of the time-consuming and cost of technology infrastructure in banks. Therefore, technological business intelligence is not sensitive to organization agility in an environment. However, this insignificant relationship does not mean that technological intelligence is losing its

power; rather, technological intelligence remains important, because of its strong relation with absorptive capacity rooted in the literature and approved in the current research.

### **Practical Implications**

Based on the results of the field study, a set of practical implications have been provided to help managers at joint venture banks to get benefited from this study.

- 1- In the big data age, organizations normally confront with intensive information. In low information-intensive industries, an important need to information has ascended, because it affects the value creation of organization agility.
  - Hence, in high information intensity environments, banks should focus their efforts in developing high-level **organizational business intelligence and absorptive capacity to enhance organizational agility.**
- 2- **The need for investing in different types of technological aspects which should be considered in supporting high-level organizational agility.**
  - **Hence, the development of different data sources, types, and quality affect organization agility strategies.**
  - **The role of high-level organizational capabilities may differ, this competency usually has a significant effect on agility and may even create occasional barriers.**

- 3- Banks should notice that structure and coordination may not function effectively in shaping organizational agility, especially when absorptive capacity is not established appropriately.**
- 4- Top management at joint venture banks should pay attention to design and implement training programs that focus on technological business intelligence and absorptive capacity**
  - Managers can be aware of the data source, data type, reliability, and accessibility regarding technological business intelligence.**
  - They should be aware of how to acquire, assimilate, transform, and apply knowledge.**
- 5- It is necessary for managers in joint venture banks to be aware of the organizational business intelligence dimensions that affect the level of agility through taking care of the process of hiring staff, being more flexible to any change in the surrounding environment, carefully watching the risk levels that the organization is facing in order to be ready to risk impact on the organization.**
- 6- The outcomes of this study are useful for policymakers and related authorities to utilize new knowledge to establish effective policies and regulations in the related banks, which in turn will positively influence the economy as a whole.**
- 7- The application of BI systems needs large investments in infrastructure and resources over a long period of time.**



- **Banks today need to manage vast amounts of business data available in various internal and external sources. Banks need to enhance their knowledge management capability by deploying BI systems to support wider organizational activities.**
- **Gain access to relevant and timely reports for decision-making is vital in the highly dynamic, unstable, and competitive environment.**
- **Banks board of directors need to share managers and employees in the process of shaping bank structure and ways of coordinating work. That will benefit the bank in achieving higher agility levels as the employees will be aware and accepting the structure they are working within.**

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