Al-Zaytoonah University of Jordan
Deanship of Graduate Studies

جامعة الزيتونة الأردنية
عمادة الدراسات العليا

The impact of big Data Dynamic Capabilities and Knowledge Absorptive Capacity on the Competitive performance: Applied study in the Jordanian banking sector

By

Rami Ahmad Abd Al Rasoul Issa

Supervisor

Prof. Dr. Sa'ad G. Yaseen

This Thesis was submitted in Partial Fulfillment of the Requirements for the Master's Degree in Business Administration

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Authorization Form

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Committee Decision

This Thesis submitted in partial fulfillment of the requirements for the Master's Degree by the student **Rami Ahmad Abd Al Rasoul Issa** and entitled: "The impact of big Data Dynamic Capabilities and Knowledge Absorptive Capacity on the Competitive performance: Applied study in the Jordanian banking sector." was defended on 18/ 08/2021.

Name	Signature	Date	
Prof. Dr. Sa'ad G. Yaseen	……	……	Supervisor, Committee Chair
Dr. Muhammad Ahmad Al-Duwairi	……	……	Internal Member
Mohammad Atwah Al-ma'aitah	……	……	External Member

Dean of Graduate Studies

Prof. Dr. Abedalrazzak Al-Shehadeh

Dedication

I dedicate this work to my beloved Mom, Wife, and Siblings

To my friends and colleagues whom always supported me in all my life's stages.

Rami Ahmad Abdel Rasoul Issa

Acknowledgment

First of all, I give thanks to god for granting me patience and power to overcome the difficulties in my life and give me the opportunities and ability to achieve this work.

I would like to express my sincere appreciation and thank my advisor Prof. Dr. **Sa'ad G. Yaseen** for his willingness to accept me as a student and for providing me great guidance towards my thesis. I was very grateful to be one of his students. I would also like to show my appreciation to the members of my thesis committee for providing their valuable comments.

To all my friends, thank you all for your support and encouragement.

Rami Ahmad Abdel Rasoul Issa

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Abstract

The Impact of big Data Dynamic capabilities and Knowledge Absorptive Capacity on the Competitive performance: Applied study in the Jordanian banking sector

By
Rami Ahmad Abd al Rasoul Issa

Supervision
Prof. Dr. Sa'ad g. Yaseen

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The study aims to examine the mediating Role of absorptive capacity in the relationship between big data dynamic capabilities and competitive performance in the Jordanian banking sector. The study used the quantitative analytical approach and use questionnaire as study tool. The population of the study includes all Jordanian commercial banks. The sample consisted of (360) IT management, executives, and department heads. The study results of the study confirmed the existence of a statistically significant effect of big data dynamic capabilities on competitive performance in Jordanian commercial banks. The study results also indicated that there is a statistically significant impact of big data dynamic capabilities on absorptive capacity. The results of the study indicated the existence of a statistically significant impact of Big data dynamic capabilities on realized absorptive capacity. The study recommended paying attention from managers of Jordanian commercial banks to the infrastructure that focuses on improving the big data dynamic capabilities in banks to increase the use of BDA in these banks.

Chapter One
Introduction

1.1 Study Background:

The technological and digital developments have a significant impact on the development of services which are delivered to people in many sectors. They include: the developments related to big data. The latter developments were made due to the development that occurred to the methods used for collecting, analysing and using data. Data is used today for meeting the needs of people by institutions responsible for delivering services

The increasing developments in digital technology and the rapid progress that the world has been witnessing in the field of ICT led to a huge information revolution (Khalil, 2020). It can be said that data has become a primary source of power for any knowledge-based society because it has become the most important resource in business organizations (Amirhm, 2020).

Al-Latrash (2015) adds that the rapid growth in data production in terms of size, source and diversity has made the term big data. Big data attracted the attention of many researchers and makers of business decisions (Miaha et al., 2017).

Khalil (2020) adds that data revolution combines a lot of data in its initial unorganized and unconnected form with each other, as we have become dealing with huge amounts of data on a daily basis such as mobile phone applications, social networking sites, WhatsApp and other.

Big data is characterized by its levels of production and large circulation in a fast and short time. It comes from different and varied sources and forms (Rashwan, 2018). Moreover; big data represents a wave of innovation that promises great advantages for giants for companies and individuals which can exploit huge amounts of data to gain a

competitive advantage and reach a decision-making process that is largely based on science and based on predictions (Youssef, 2018). Ghasemaghaei (2011), Javdan and Ghasemaghaei (2019) and Yadegaridehkordi et al.,(2020)

If data is managed properly and objectively, data can have positive impacts on the economic and social development. That directly affects the financial and operational performance of business organizations. (Amirhm, 2020). The degree of reliability of this data varies in one way or another. Such variation makes the analysis of big data in need to control the way in which the main methods extract and analyze educational data (Rashwan, 2018).

In the context of big data, and at the level of large companies that use technology, the physical capital resources include a major program used to store, collect or analyze big data. So, the traditional software is not capable of our time to analyze big data (Erevelles, 2016). Accordingly Firms in different sectors need to create platforms that are capable of analyzing and storing large volumes of data that flows continuously in real time from many various sources (Davenport et al., 2012).

Lau and Lo (2015) add that to overcome the difficulties faced by companies, their need to develop carrying capacity, which refers to the ability of the firm to benefit from external knowledge through the sequential learning processes of assimilation, acquisition, exploitation and transformation.

In light of the changing work conditions and the increasing competition, the Jordanian commercial banks have been searching for solutions and strategies that enable them to face unexpected, unpredictable and unprecedented environmental conditions (Al-Mahamid, 2015).

1.2 Statement of the Problem:

In our global competitive business world, data explosion and commercial banks need to meet new challenges and opportunities to enhance their competitive performance. Thus, most banks concerned to Big Data Analytics Dynamic Capabilities for their long-term success and sustainable growth (Youssef, 2018).

Big Data Analytics Dynamic Capabilities are essential for gaining competitiveness in the banking industry Ghasemaghaei (2011). Despite that, few studies were conducted in this field. Therefore, this study attempts to answer the below questions:

- How do big data capabilities influence the banking competitive performance?
- How do potential absorptive capacity and Realized capacity mediate the relationship between big data capabilities and competitive performance in the Jordanian Banking Sector?

1.3 Objectives:

The current study aimed to investigate the impact of big data dynamic capabilities and absorptive capacity on the banking competitive performance in Jordanian Commercial Banks. The main objectives are:

- Identify the effect of big data dynamic capabilities on the competitive performance.
- Understand the relationship between absorptive capacity and big data dynamic capabilities.
- Explore the mediating role of absorptive capacity on the relationship between big data dynamic capabilities and competitive performance.

1.4 Significance of the Study:

The studying effect of big data dynamic capabilities and absorptive capacity on the banking competitive performance is essential to understanding the relationship between these variables in general and particular at Jordanian banking industry.

The contemporary knowledge-intensive business environment is characterized by relentless, rapid, and highly unpredictable changes. In such an environment, banks must be capable of detecting and capitalizing market shifts. They must be capable of avoiding emerging threats fast and surprise to survive.

Big Data Dynamic Capabilities enhance the bank ability to compete in the rapidly banking industry.

Moreover, a growing number of banks have been accelerating the deployment of their develop critical insight. Such an insight can ultimately provide companies with the strategic flexibility and the degrees of freedom to evolve and adapt in the high-velocity environments, absorptive capacity allows forms for sustaining a competitive advantage even in an industry context that's dynamic.

Banks play a significant role in supporting the Jordanian economy and raising the growth rates. They play such a role through lending people and SMEs and big-sized enterprise. They contribute to raising the value of exports and recruiting people. They contribute to raising welfare of society.

This study provides researchers a review for the relevant literature that contributes to improving the organizational Big Data Dynamic Capabilities. The main goal of this study is represented in investigating the effect of Big Data Dynamic Capabilities on the competitive advantage of banks.

In addition, this study shall investigate the mediating impact of the absorptive capacity on the relationship between Big Data Dynamic Capabilities and competitive advantage in the Jordanian banking sector.

1.5 The Study Methodology

The researcher adopted an exploratory approach in the aim of exploring the impact of large data dynamic capabilities and absorptive capacity on competitive performance in the banking sector.

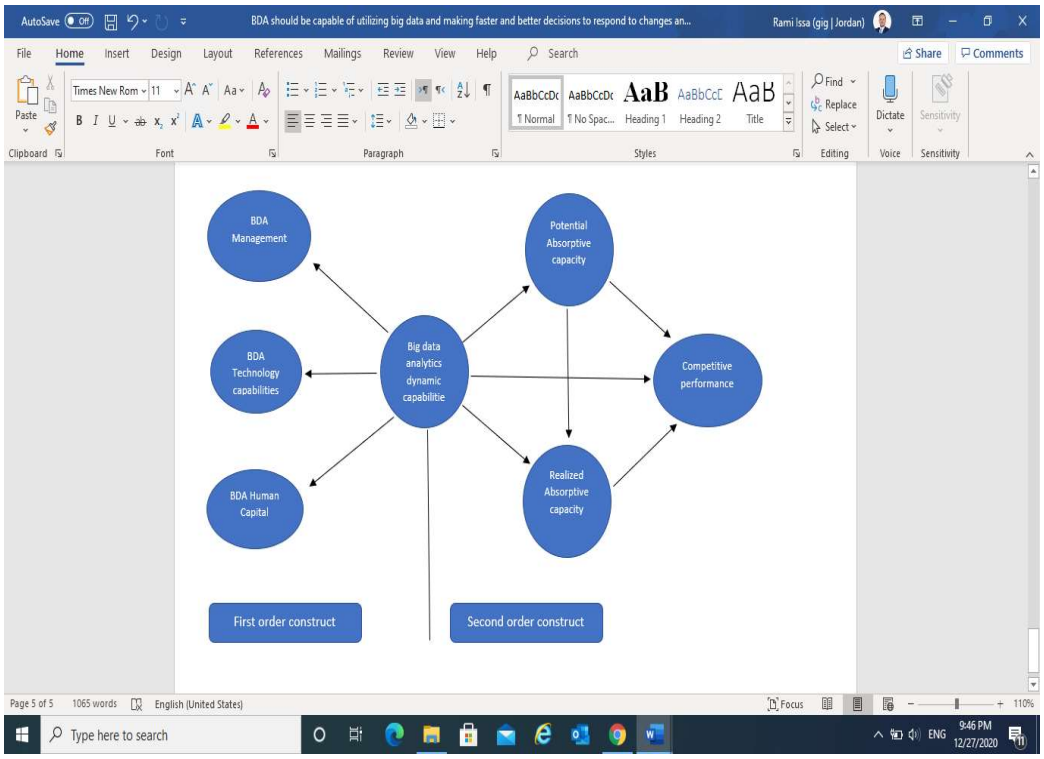
In such exploratory series studies, the researcher collects and analyzes qualitative data as a first step and based on the results the quantitative data collection process is carried out (Onwuegbuzie et al., 2010). Qualitative data is used with the aim of exploring how a phenomenon occurs or why it occurs, which helps develop a theory, or describe the nature of a person's experience, while quantitative research methods address questions about generalization, and causation, between variables (Fetters et al., 2013). The proposed model in this study includes two stages of building order construct; the first one related to big data dynamic capabilities. The second one related to absorptive capacity and its effect on banking competitive performance. The population of this study is the Jordanian Commercial Banks, the sample consisted of (360) IT management, executives, and department heads.

1.6 The Study's Model and Hypotheses

The researcher reviewed the relevant literature to determine the variables and composition of the model used in this study

Figure (1) presents the model used in the present study. It suggests that big data dynamic capabilities and absorptive capacity factors affect the banking competitive performance.

Figure (1.1): The Study's Model



The study's model presents the influence big data dynamic capabilities as independent variables which includes (big data management, technological capabilities, and human capital) on competitive performance as dependent variables through knowledge absorptive capacity as intermediate variable which includes: potential absorptive capacity, and the realized absorptive capacity

1.7 Conceptual Definition

- **Big data analytics** is where advanced analytic techniques operate on data sets that are big. Hence, big data analytics is about two things—big data and analytics—plus how the two have teamed up to create one of the most profound trends in business intelligence (BI) today. "Russom, P. (2011).
- **Technological Capabilities**: They refer to the skills and information which allow b**ig data analytics capabilities:** Big data analytics as a new generation of architectures and technologies. They are designed for having the value exacted in an economic manner from very large volumes of a wide variety of data through enabling high velocity capture, discovery and/or analysis.
- productive enterprises to utilize technology and equipment in an efficient manner. Such skills and information are either technical, institutional or managerial.
- **Human capital**: It is an intangible asset or quality that isn't listed on the balance sheet of the bank. It can be classified as the economic value of the skills and experience of the employee. It is assessed based on the training, education, intelligence, health, loyalty, skills, and punctuality of the employee.
- **Big data management: It** is the organization, governance and administration of large volumes of structured data and unstructured one. The goal behind big data management is represented in ensuring that the data quality is high. It's represented in ensuring that there are accessible business intelligence and big data analytics applications.
- **Potential absorptive capacity (PAC):** It enables a firm's receptiveness to external knowledge;
- **Realized absorptive capacity (RAC)**. It consists from transformation capability. It's defined as the capability of a company to refine and develop the routines that facilitate

the process of mixing the existent knowledge with one acquired recently and assimilated knowledge

- **Competitive performance:** The measurable results of competitiveness (i.e., the outcome of the efforts of a country or a firm in selling a competitive goods or services in international trade).

1.8 The Study's Hypotheses:

Based on the study's questions and model, the researcher drafted several hypotheses. Those hypotheses aim to explore the relationship between the study's variables. They are listed below**:**

H_1: Big data dynamic capabilities have a positive direct impact on the competitive performance.

H_2: Big data dynamic capabilities have a positive impact on the potential absorptive capacity.

H_3: Big data dynamic capabilities have a positive impact on the realized absorptive capacity.

H_4: Big data dynamic capabilities have a positive impact on the competitive performance through absorptive capacity and realized absorptive capacity.

H_5: Potential absorptive capacity has a positive impact on the Realized absorptive capacity.

1.9 The Study's Structure

This thesis is coordinated as the following; chapter one: an introduction to the topic of the study with explanation of its importance, study problem, aim and objectives, and a short review of variables and how do big data capabilities influence banking competitive performance

Chapter two is a literature review. This chapter mainly attempts to describe essential variables and factors. In addition this chapter explains the relationship between the variables of this study.

Chapter three: The study methodology. This chapter includes research philosophy, paradigm, methods and research approach. The chapter explain the method for collecting data and analysis and research strategy will be presented. The study population, sampling, types of study design and the collection of data will be clarified. The validity and reliability of instrument will be identified in this chapter.

Chapter four: Data Analysis and Results. This chapter is an overall view about data analysis and results. This chapter will show the measurements and translating raw data collected from study instrument which related to the variables of this study. The data analysis includes, population and sample frequencies related to demographic characteristics of the sample; this include age, gender and years of experience followed by a display of techniques used to analyze data. Moreover; this chapter will includes exploratory study and structural equation modeling to conceptualize influences between variables and last the proposed hypotheses are represented.

Chapter five: Conclusion, Discussion and Implication. This chapter presents the conclusion and summary of results from data analyzing. It starts with a conclusion and discussion of the study followed by limitations associated with this study. The recommendations for future researches, contribution and implication of the study will be included.

1.10 Conclusion

This research aimed to investigate the way in which big data capabilities affect banking competitive performance. In addition to study if potential absorptive capacity and Realized capacity mediate the relationship between big data capabilities and competitive performance in the Jordanian banking sector. The significance of this study arises from the important of big data dynamic capabilities to enhance the bank ability to compete in the rapidly banking industry. The methodology includes sequential exploratory study method and quantitative method. The proposed model in this study includes two stages of building order construct; the first one related to big data dynamic capabilities. The second one related to absorptive capacity and its effect on banking competitive performance. The sample of this study is the Jordanian Commercial Banks.

Chapter Two

The Theoretical Framework

2.1 Introduction

This chapter presents the review of literature addressing the primary variables in order to provide clear understanding of the concepts of big data dynamic capabilities, absorptive capacity, and banking competitive performance. Based on reviewing the previous studies, it presents a theoretical review about the relationship between big data dynamic capabilities and absorptive capacity and the way it effects on the banking competitive performance.

2.2 Big Data Concept:

Data has been growing at a very rapid rate every day more and more tools are added for data entry such as smart phones, space sensors, geolocation locators, social security readers, traffic and traffic data readers, information inputs, students, employees and workers all over the world (Weiss, 2012).

Data refers to a set from letters, symbols, words, numbers, or raw images that are related to a specific topic. It can be obtained through observation, or researching and recording processes (Mazhar, 2018).

Data also refers to “raw materials and facts that are worthless in their initial form, objective and unconnected about the events” (Farajat, 2013, p.13).

Regarding facts, observations and measurements, data may be in the form of letters, symbols or special shapes in order to represents specific ideas or topic, it’s not meaningful or can’t benefit from it (Obaid, 2019). Miaha et al (2017) add that big data is distinguished by its size (much larger than traditional data sets), speed (the rapid speed

with which it is produced and available), diversity (formats in particular), variability (over time and diversity of sources), and volatility (inconsistent levels of production).

Marfo and Boateng (2015) state the following: “The big data capabilities identified are technological, data management, legal and ethical, analytical, data sharing and decision making capabilities”. Zhang and Lv (2021) add that big data capabilities contribute to enhancing the smart services delivered by the government. Raguseo and Vitari (2017) add that big data capabilities contribute to improving the financial performance.

Weiss (2012) adds that term of big data refers to a huge set of complex and highly interwoven data such as (tweets on Twitter, text messages) and its related to a specific product, post, status or video, stock trading volume, weather indicators, news, or etc

Big data usually involves data sets of sizes that exceed the capacity of the programs that are commonly used to manage, capture and process data within an acceptable duration (Snijders et al., 2017, 1)

2.3 Big Data Characteristics

Big data refers to data warehouse of information which characterized by a major size, speed and diversity and in general requires having innovative and effective means of processing it that differ from the counterpart means used for processing ordinary data so processing it shall improve visibility, decision-making, and the automation process (Teest and Goldner, 2013). Big data is a large, complex, and growing dataset with multiple sources (Wu, Zhu, Wu, and Ding, 2013). It can’t be managed through using the current methodologies nor usual data extraction software (Fan and Bifet, 2013).

Big data is characterized by its levels of production and large circulation in a short and fast time and comes from various sources with various forms (Yousef, 2018).):

The main source of data is the person and the reason behind the rapid growth in data production is attributed to the proliferation of devices, and systems connected to the Internet, and the increasing use of digital media by institutions and individuals, and the transformation has taken place (Al-Muzayen, 2019). However; Erevelles (2016) suggests that big data has many characteristics such as:

- Volume: It refers to the volume of data extracted from a source.
- Variety: It refers to the diversity of extracted data.
- Velocity: It refers to the speed of production and extraction of data and sending it to cover the demand.
- Veracity: It refers to the reliability of data as the users care about information and about the quality of the data.
- Value: It refers to the contribution of data in making a sound decision in a timely manner at organizations.

2.4 The Significance of Big Data

The awareness has been increasing about the significance of big data and its role in promoting sustainable development because it is the new oil that causes revolutions and changes within society, especially if it is used with care and accuracy (Maqani and Shabila, 2019).

Big data offers opportunities to understand society, improve the living conditions, and carry out business transactions. Maqani and Shabila (2019, 15) add that Arab countries

have been exerting much effort to acquire and exploit technological means. However, it seems that they are still within the bounds of good intentions, and lack sufficient investment for this potential, and use it in processing and analyzing big data to make adequate use of it in their development policies.

The importance of big data and its analysis in the business environment as it offers a high competitive advantage for enterprises and contributes to rationalizing the decision-making process (Yunus, 2019).Big data affects the board level decision-making process (i.e. the process of making decisions by the board of directors) (Merendino et al., 2018)

Big data provides the opportunities for governmental and private institutions to obtain valuable statistical information from the huge amounts of data which collected from different and varied sources as smart applications exchange various information using embedded sensors and other devices integrated with cloud computing (Hashem et al., 2016).

Organizations can benefit from storing and analyzing big data in many areas, such as: asset management, databases of the beneficiaries, human resource development, information systems available in the organization (Zhaohao et al., 2018).

2.5 The Benefits of Big Data

Big data is an important resource for acquiring knowledge. It has a major influence on acquisition, utilization and sharing (Al-Aklabi, 2020). There are many sources of big data, including those arising from running a program, whether it is a governmental or non-governmental program, such as: electronic medical records, hospital visits, insurance records, bank records, food banks, and others (Al-Bar, 2018).

It is hard to work with big data through using most relational database management systems, desktop statistics, and simulation packages (Magoulas and Lorica, 2009). Therefore, through analyzing big data, organizations can manage their assets in a unique manner. Such analysis shall enable organizations to identify the gaps in their assets. It shall reveal the deficit or increase in those assets beyond the required limit, which is needed by decision-makers (Amirhm, 2020).

Commercial or transaction-related sources serve as other sources such as data arising from transactions between two entities, and the benefits of big data come from many perspectives such as: information transparent, exposing variability, segmentation of customers and development of products and services (Marfo and Boateng, 2015).

2.6 Big Data Analytics Capabilities:

The phenomenon of big data has been receiving increasing attention by industry analysts, business strategists, and marketing professionals due to new developments and ideas that drive innovation and advancement in all fields (Magani and Shabila, 2019). During the contemporary age, people have been producing data at high rates and unprecedented images in terms of the size of this data and the speed of its production (Amirhm, 2020). ‘Big data analytics’ describes the activities involved in the specification, capture, storage, access and analysis of such datasets to make sense of its content and to exploit its value in decision-making (Miaha et al., 2017).

Big data represents a significant stage in the development of information and communication systems. It involves a huge amount of complex data which exceeds the ability of traditional software and computer mechanisms to process, distribute and store it (Al-Bar, 2018). It should be noted that the superiority of human beings and the ability of software and computer programs to analyze and convert data into usable information;

So that its users can improve vision, and make appropriate decisions (Le-Hong and Laney, 2013).

Big data analytics refers to “a new generation of technologies and architectures, designed to economically extract value from very large volumes of a wide variety of data, through enabling high velocity capture, discovery and/or analysis” (Mikalef et al., 2020)

Many studies have confirmed that big data is an increasing number of big data which contributes to knowledge of new ways of manufacturing, doing business, management, governance and methods of control (Kitchin, 2014). Samsudeen (2020) and Bogdan and Borza (2019) add that big data analytics (BDA) contribute to raising the organizational performance level. Grover et al.,(2018) add that big data analytics (BDA) contributes to create a strategic business value. They add that big data analytics (BDA) contributes to create a competitive advantage. Pignic et al.,(2020) add that big data analytics (BDA) contributes to raising firm profitability. Fernando et al.,(2018) add that big data analytics (BDA) contribute to improving the service supply chain performance.

Miaha et al (2017) suggest that big data analytics leverages multiple datasets from a heterogeneous variety of media and associated metadata to make decisions about the future, and predictive analytical techniques designed for smaller, structured data sets will need to be adapted, supplemented, or replaced.

Based on the aforementioned information, information shall be presented about the study’s variables related to big data. Those variables include: big data management, technological capabilities, and human capital

2.7 Big Data Management:

The nature of that big data has imposed great updates on the way in which organizations work and manage things in various fields (Kitchin, 2014). Therefore, big data-related management strategies in organization are implemented efficiently to search for valuable data. Such data offers opportunities for forecasting and the ability to make the correct decision. It is used to monitor the progress towards meeting the goals of sustainable development (Magani and Shabila, 2019).

2.8 Technological Capabilities:

Big data can improve the ability of investors to make decisions through enhancing the quality of the data that are obtained. It can improve the decisions of managers and enhance the financial and operational performance of business organizations (Hilbert, 2015).Ferraris et al.,(2019) add that technological big data capabilities contribute to enhancing the firm performance.

Technical capacity (TC) that allows companies to carry out technical functions -like: research and development - through employing modern technologies that provide high-tech products. (Teece, Pisano, and Shuen, 1997). Yousef (2018) suggests that methods developed in order to analyze bid data include: learning analysis, large-scale learning, modeling, artificial intelligence communities, learning how to apply these methods and when to apply them.

Technological capacity is the ability to perform any related technical function or volume activity within a bank including the ability to develop new products and processes, and to operate facilities effectively. (Teece et al., 1997). It has become very significant because responding to the needs of the dynamic market requires developing

new products which are increasingly intertwined with new technologies (Hsieh and Tsai, 2007).

Firms with advanced technological capabilities tend to show high performance because mastering the latest technology allows them to lead in process innovations that lead to competitive advantage through efficiency gains. (Tzokasa, et al., 2015). Accumulation of technological knowledge not only increases product innovation skills, but also increases the bank's ability to engage in the transformation process by evaluating, using and implementing new technologies. (Zahra and George, 2002).

2.9 Human Capital

Human capital refers to resources that involve the knowledge, skills, and tacit experience of the employees (Yaseen et al., 2016). Hsu and Fang (2009) reported that human capital comprises all business capabilities embedded in employees and not owned by the organization.

Funding the human capital development processes improves employee training that enables the bank to develop a new knowledge blueprint on knowledge (Lau and Lo, 2015). In the context of big data, human capital resources include insights into data scientists and strategists who know the way of capturing information from consumer activities, and managing and extracting insights from big data. (Erevelles et al., 2016). Human capital moderate the process of transforming consumer activities into a sustainable competitive advantage at different stages (Viaene, 2013).

It’s noted that Creative intensity lies in the skills of the members of the organization who generate innovative ideas through human capital resources in addition to the organizational culture that enables the bank to use the innovative ideas. (Richard, 2000).

2.10 Knowledge Absorptive Capacity

Knowledge management is very important because it reveals behaviors, experiences and experiences and employ them in gaining competitive advantage and works to share and share them (Al-Aklabi, 2020). The assimilation of knowledge is a dynamic and necessary process that individuals and organizations need both for survival, growth and development (Zahra, 2020).

An effective absorptive bank has a high level of relevant prior knowledge that helps it recognize, assimilate and apply the value of new information to create commercial value. (Lau and Lo, 2015). Absorptive capacity refers to the ability of companies to assimilate, recognize and apply the value of new external knowledge to commercial ends (Flatten et al., 2011).

Cohen and Levinthal (1990) define absorptive capability as "made up of three basic capabilities, which are recognizing useful external knowledge, understanding and assimilating the new knowledge, and applying it to commercial ends". Zheng et al (2011) add that underlying process include knowledge-based dynamic capabilities should consists of knowledge related activities to both internal knowledge and external knowledge embedded in alliances and networks.

Regarding knowledge absorptive capability its enables them to understand the changes and developments that occur and thus identify appropriate situations in dealing with them, and there is a conflict in determining the levels of absorptive capacity(Zahra, 2020).

Organizations that have a high absorptive capacity can collect information from their various sources, such as suppliers, competitors, research institutions, clients, etc.

Absorptive capacity is one of the dynamic capabilities of the organization. It includes a set of procedures and processes related to the acquisition, assimilation, dissemination and application of external knowledge (Khater, 2021).

The key precedents for carrying capacity include relevant prior knowledge (which usually involves basic skills and experience). They include organizational factors like communication structure and knowledge distribution. (Flatten et al., 2011). A measure of absorptive capacity was developed by closely following the established process of item generation and scale development (DeVellis, 2003)

Absorptive capacity enables firms to respond effectively and persist in such dynamic complexity in order to screening mechanism to productively utilize external knowledge for organizational advantage (Lane and Lubatkin, 1998)

Organizations need to acquire, absorb, and employ the new external knowledge along with the current stock of knowledge and apply it to serve commercial objectives, and the absorptive capacity of the organization depends on the process of dynamic interaction between the organization and the external environment and on the behavior of members within the organization and their ability to make use of the new knowledge (Jeong et al., 2019). Zahra and George (2002) distinguish between potential absorptive capacity (knowledge assimilation and acquisition) and realized absorptive capacity (knowledge exploitation and transformation).

2.11 Potential Absorptive Capacity (PAC)

Potential absorptive capacity lead to ‘‘renewing a firm_s knowledge base and the skills necessary to compete in markets that change constantly (Zahra and George, 2002). The potential level of organizational knowledge diffusion over a given time period based upon set conditions (Schreiber and Carley, 2008).

The potential absorptive capacity enables firms to explore new sources of knowledge, while realized AC ensures that newly acquired knowledge can be utilized for meeting commercial goals (Lau and Lo, 2015). Moreover, since carrying capacity is likely to be a multi-dimensional building, it is possible to debate whether any one-dimensional scale can fully measure this complex construction. (Flatten et al., 2011).

The process of exploiting knowledge differs from one organization to another. That is because each organization exploits knowledge in its own way because it is affected by the culture of the organization, and the process of creating knowledge is linked to the organization’s strategy to improve processes, products, research and development, etc (Zahra, 2020). Lau and Lo (2015) reported that absorptive capacity consists of 4 distinctive but complementary organizational learning processes. Those processes are: acquisition, transformation, assimilation and exploitation.

2.12 Realized Absorptive Capacity (RAC)

Realized carrying capacity consists of transfer capabilities, that enable companies to develop new operations or add changes to existent processes, and exploitation capabilities, that are utilized to transform knowledge into new products for enhancing the performance level and achieving a competitive advantage. (Flatten et al., 2011).

Rodriguez et al (2014) add that the achieved carrying capacity fully mediates the effect of potential carrying capacity on innovation outcomes in the Spanish auto component manufacturing sector. However; the value and acquisition of external knowledge, with the aim of building the bank's knowledge tanks in order to achieve the carrying capacity that enhances the knowledge acquired in its operations, with the aim of developing innovation (Lau and Lo, 2015).

Camison and Fores (2010) add that the bank's high levels of knowledge in practice, acquisition, and assimilation of knowledge do not necessarily lead to better innovative production, unless potential carrying capacity (i.e. knowledge acquisition and knowledge assimilation) positively affects the absorptive capacity achieved (i.e. knowledge transfer and knowledge exploitation)

The competitive advantage that it brings to those organizations that considered big data as an important source of knowledge that supports decision-makers. At the same time big data applications are developing, and the fields in which they operate based on the data that you operate, and with which they are able to execute the commands that they receive (Al-Aklabi, 2020).

2.13 Competitive Performance

Mikalef et al (2020) add that competitive performance of organization currently has managed in order to obtain are a result of strengths built in reaction to environmental responsive-ness strategies such as big data involvement. Environment must be provided by organizing and rearranging the bank's resources and assets in order to be able to mitigate the negative effects resulting from these changes by practicing knowledge management processes that lead to the creation of new knowledge which included in

various operations and activities that improve the banks' competitive performance (Al-Mahamid, 2015).

The competitive advantage has become a driving force which many firms seek achieving to outperform their competitors (Marfo and Boateng, 2015). Competitive performance is the lowest economic results that can be obtained from gathering information about the rate of sales growth, cash flows, return on investment, and economic value, which aims to implement the general strategy of the organization (Ndungo et al., 2019).

The evaluation of financial and competitive performance represents the determination of how to evaluate the performance of the organizations as a whole and also a plan to improve and develop performance (Amirhm, 2020).

Financial performance is one of the components of improving the ability and competitive performance of the bank, and it stems from the concept of the financial function, for improving the use of available funds and resources efficiently and effectively within the organization and the financial performance reflects the ability of the organization to generate profits during a certain period of time (Hassan, 2015). Ndungo et al (2019) add that data management is one of factors affecting the financial return and the extent of achieving financial returns related to all activities, and the proper use of available resources by achieving financial goals at the lowest possible costs.

When the evaluation competitive performance is applied in a good and correct manner, it has positive implications for the expected future performance of the organizations. Business, and in this regard, the criteria for performance appraisal emphasize two aspects (Amirhm, 2020):

1. Objective: Focuses on the amount of work performed and the speed in performing this work and achieving goals.
2. My behavior: reveals the qualities of workers in the organization, such as the speed of learning and the benefit of training, and this will only come through the presence of information density provided by big data analyzes.

Big data allow the owners of enterprises to achieve competitive advantage, because it offers a deeper understanding of its customers and their requirements in order to increasing efficiency, profit and reducing waste, so data analysis is vital and necessary for business owners and companies (Hassanein, 2020).

There are many distinct applications that are improving many areas through the use of big data, there are several main areas in which big data is currently, which helps to increase the competitive performance of the bank, including: understanding and targeting customers, understand and improve business processes, personal evaluation and performance improvement, improving the performance of machines and machines (Atom, 2020).

2.14 Previous Studies

The previous studies were reviewed to study the concepts of variables related to the current study. Previous studies were used to build the model and understand the relationships and influences between the variables that formed the basis for forming the hypotheses of the study. The results of previous relevant studies have been used as evidence and sources. A full set of studies used in this study is listed in Appendix C and summarizes a number of the most relevant papers in the following:

Zhang and Lv (2021) add the effect of big data capabilities on government's smart service performance in China. They collected data from 289 employees in public departments. They concluded the following (1) Big data management capability has a significant positive impact on big data human capability and big data system capability. (2) Big data system capability has a significant positive impact on big data human capability. (3) Big data system capability and big data management capability have a significant positive effect on smart service performance. (4) The impact of big data human capability on smart service performance is not however significant enough to bring about the improvements which the government seeks.

Ghasemaghaei (2021) explored the impact of big data on firm performance. The data was obtained from 143 top and middle level managers in the United States. The findings show that data variety positively improves data value generation, whereas data volume and data velocity do not impact it. Additionally, while data volume negatively impacts data veracity, data velocity and data variety positively impact it. Findings indicate the necessity of conceptually differentiating among big data characteristics in investigating their impacts on firm outcomes instead of treating big data as a holistic variable.

AL-Ma'aitah (2020) explored the impact of big data and predictive analytics (BDPA) capability on crisis management in the Greater Amman Municipality (GAM) in Jordan. He used a thirty two item questionnaire. 140 questionnaire forms were filled. However, 128 questionnaire forms are valid for analysis. The researcher found that big data and predictive analytics (BDPA) capability have a significant impact on crisis management in the Greater Amman Municipality (GAM) in Jordan

Yadegaridehkordiet al.,(2020) explored the impact of big data on firm performance in the hotel industry. Data was collected from top managers and/or owners of SMEs

hotels in Malaysia using online survey questionnaire. The researchers found that big data significantly affects the firm performance in the hotel industry.

Samsudeen (2020) explored the effect of the big data analytics (BDA) on firm performance. They explored the mediating effect of knowledge management (KM) on the relationship between big data analytics (BDA) and firm performance. They collected data from 107 SMEs in Sri Lanka. The results confirm that organizations with technological and managerial BDA capabilities demonstrate improved performance mediated by KM. BDA can potentially transform the way businesses compete with each other via improved comprehension, processing and exploitation of copious amounts of data derived from various sources and processes, internally and externally

Ghasemaghaei, and Calic, (2020) explored the effect big data on firm innovation performance. They carried out an empirical investigation and obtained data from 239 managers. The results reveal that, while data variety and velocity positively enhance firm innovation performance, data volume has no significant impact. The finding that data volume does not play a critical role in enhancing firm innovation performance contributes novel insights to the literature by contradicting the prevalent belief that *big data is better data*. Moreover, the findings reveal that data velocity plays a more important role in improving firm innovation performance than other big data characteristics.

Shahbaz et al.,(2020) explored the effect of the big data analytics (BDA) and customer relationship management (CRM) capabilities on the perceived sales performance. They collected data from 40 employees. They found that the big data analytics (BDA) and customer relationship management (CRM) capabilities have significant positive effects on the perceived sales performance. They found that the big data analytics (BDA) creates organizational dynamic capabilities (e.g. CRM capabilities). BDA and CRM capabilities

affect the perceived sales performance. In addition, the CRM capabilities has a significant mediating impact on the relationships between BDA and perceived sales performance.

Suoniemi et al.,(2020) explored the impact of big data on firm performance. They explored the mediating effects of market-directed capabilities and business strategy. They collected data through a survey from 301 senior marketing managers. They found that big data has a significant impact on firm performance. They found that market-directed capabilities and business strategy have significant mediating effects on the relationship between big data and firm performance.

Pignic et al.,(2020) aimed to explore the relationship between big data analytics (BDA) solutions and firm profitability. Information on 176 firms was obtained. The researchers found that there is a negative moderating impact for industry concentration size on the relationship between the use of big data analytic (BDA) solutions and firm profitability. They found that there is a positive moderating impact for firm size on the relationship between the use of big data analytic (BDA) solutions and firm profitability. They found that there is a significant relationship between big data analytics (BDA) solutions and firm profitability.

Amirhm (2020) examines the effect of big data analysis on the financial and operational performance of business organizations. The sample consisted of a group of companies listed on the Egyptian financial market. A questionnaire was distributed to (155) managers in these companies. A group of statistical methods were used to prepare an applied study with the aim of achieving the research objectives. The study found that Business organizations achieve many advantages when analyzing big data, including contributing to giving a comprehensive view of the organization, increasing understanding of the organization's activities, improving the financial and operational

performance of these organizations. The results also found that the analysis of big data explains 70% of the change in the financial performance of organizations, and the analysis of big data explains 63% of the change in the operating performance of the organizations.

Mikalef et al (2020) explored the indirect relationship between a bank's ability to analyze Big Data (BDAC) and competitive performance. The study expands current research by suggesting that BDACs enable companies to generate insights that can help enhance their dynamic capabilities, which in turn positively impact their marketing and technological capabilities. A survey was used. Data was obtained from 202 senior information officers and IT managers working for Norwegian companies. The study results indicated that strong BDAC can help companies build a competitive advantage. This effect is not direct but is fully mediated by dynamic capabilities, which have a positive and significant effect on two types of operational capabilities: marketing and technological capabilities.

Khalil (2020) explored the degree of awareness of members of the academic and administrative bodies in Jordanian universities of big data, the descriptive survey approach was used, the questionnaire consisted of (12) items distributed into three areas, and the sample size was (150) from members of the academic body and (151) Among the members of the administrative body in Jordanian universities. The results of the study showed that the degree of awareness of the members of the academic, administrative and academic bodies in Jordanian universities of big data was high in both departments, and the study showed that there were no statistically significant differences in the degree of awareness of members of the academic body in Jordanian universities of big data attributable to The variables of the college and academic rank, and the existence of statistically significant differences in the degree of awareness of the members of the

administrative body in Jordanian universities of big data for the variable of the administrative unit attributable to the benefit of the Information Technology Department.

Qaisar et al (2020) analyzed the key drivers (commitment, integration of big data, green supply chain management, and green human resource practices) of sustainable capabilities and the influence on which these sustainable capabilities impact the banks' environmental and financial performance. The findings indicate that big data analytics strategies have an impact on internal processes and banks' sustainable and financial performance. This study indicates that banks committed towards proper data monitoring of its clients achieve operational efficiency and sustainability goals. Moreover, internal and external green supply chain management practices have a positive impact on banks' environmental and financial performance.

Behl (2020) investigated the big data analytics capabilities of tech startups help them gain competitive advantage and improve their firm performance. He carried out his study in two countries; India and China. He found that big data analytics capabilities have a positive and significant impact on the firm performance and competitive advantage of tech startups. While organizational culture proved to have a positive impact as a moderator, innovation was found to have non-significant effect. The results also found to have non-significant effect of age of the firm while its country of origin does play an important role in defining its success.

Ferraris et al.,(2019) explored the impact of big data analytics capabilities on firm performance. Data was obtained from 88 Italian SMEs. The findings of this paper show that firms that developed more BDA capabilities than others, both technological and managerial, increased their performances and that KM orientation plays a significant role in amplifying the effect of BDA capabilities.

Mikalefa et al.,(2019) explored the relationship between big data analytics positively affect firm performance. They used a survey to obtain data from 175 chief information officers and IT managers. Those officers and managers were chosen from Greek firms. The researchers found that big data analytics positively affect firm performance

Bogdan and Borza (2019) explored the relationship between big data analytics and organizational performance. They carried out a meta-analysis. They found that the big data analytics play an important role in raising the organizational performance level.

Makani and Shabila (2019) aimed to shed a light on the way in which the big data is used for achieving sustainable development, its areas of use, whether it has a role in decision-making, and its added value in changing society to achieve sustainable development goals. They adopted the descriptive approach. They found that governments should follow ways to improve their performance in order to survive, and achieve sustainable development goals by relying on big data, and exploiting them by developing public and private partnership mechanisms that would transfer knowledge and exchange big data within a strategy and a national system for data for development, as it is considered the most important Strategies that developed countries are currently relying on in order to accelerate progress. Big data may be a key factor in production, perhaps more important than land, labor and capital, to drive higher levels of quality and efficiency. Arab countries should realize that big data is a very promising future in all sectors.

Yunus (2019) explored the effect of big data analysis on improving the quality of accounting information. He adopted a descriptive analytical approach. He surveyed a sample consisting of academics, financial analysts, and accountants in Saudi Arabia. He found that business organizations achieve many advantages when analyzing quantitative

data, including contributing to giving a comprehensive view of the departments of institutions, increasing understanding of their activities, and developing their strategy and business model. He found a statistically significant effect of analyzing big data on improving the quality of accounting information.

Othman (2019) explored the effect of knowledge management as a mediating variable between big data and achieving strategic leadership, and the study population was made up of workers in the main directorates of cellular communications companies in Syria. He used a quantitative approach to re-test the hypotheses in the new study population, by taking a random stratified sample of (140) individuals. The study reached a set of results, the most important of which are: There is a partial mediating role of statistical significance for knowledge management in the relationship between big data and strategic leadership. There is an effect of big data in knowledge management. There is an effect of big data in achieving strategic leadership. There is an effect of knowledge management in achieving strategic leadership. There are similar differences Statistical significance between the average responses of employees in the category of years of experience on both the knowledge management and strategic leadership axis.

Zareravasan and Ashrafi (2019) proposed a conceptual model in order to investigate the relationship between BDA use and innovation performance by considering the role of dynamic ability (DC) theory. In this paper, we consider the well-established agility of DC theory and analyze it into three main factors that communicate with agility, decision-making agility and agility. The research model and the required data were analyzed through using partial least squares (PLS) / Structural Equation Modeling (SEM). The researchers found that companies will be able to increase their innovation performance

from DC theory. They found that using BDA has a positive effect on corporate agility sensing.

Grover et al.,(2018) explored the relationship between big data and analytics (BDA) and strategic business value. They carried out a meta-analysis. They found that big data and analytics (BDA) contributes to creating a strategic business value. They also found that big data and analytics (BDA) contributes to creating a competitive advantage

Fernando et al.,(2018) explored the impact of big data analytics (BDA) on firm's ability to manage data security, service supply chain innovation capabilities and service supply chain performance. The data were collected through survey from 145 service firms. The researchers found that the big data analytics (BDA) has a positive significant impact on firm's ability to manage data security. It was found that the big data analytics (BDA) has a positive significant impact on service supply chain innovation capabilities and service supply chain performance. It was found that most of the sampled companies study used Big Data analytics to execute existing algorithms faster with larger data sets.

Merendino e al. (2018) explored the impact of big data on the board level decision-making process (i.e. the process of making decisions by the board of directors). They collected data from several directors involved in high-level strategic decision-making were interviewed. They found that big data affect the board level decision-making process (i.e. the process of making decisions by the board of directors)

Rashwan (2018) explored the role of big data analysis in rationalizing financial and administrative decision-making in Palestinian universities. A descriptive analytical approach was used. The researcher used questionnaire after evaluating and judging the research sample consisting of administrative representatives and academics, deans of

faculties of economics and administrative sciences, and heads of financial and administrative departments. In the Palestinian universities, their number is (165) single. The researcher found that collecting, processing and storing big data helps in obtaining accurate information on the basis of which administrative decisions are made within Palestinian universities.

Elsirr (2018) explored the main challenges and opportunities in hospitals in the Gaza Strip to adopt "big data technology". He explored the impact of five variables (support of senior management, organizational culture, skills of information technology personnel, security and protection, technology cost) on the technology of big data. He found that senior management supports the adoption of big data management at a rate of 6.21%, while the organizational culture of the organization obtained a rate of 6.26% in its contribution to facilitating the adoption of big data management, and 2.26% of workers in the field of information technology have awareness and willingness to adopt big data management 1.60% of the study population considers that the confidentiality and security of information is a major challenge facing the adoption of big data management.

Rodriguez and Cunha (2018) reviewed the literature related to the way in which the absorptive capacity affects the impact of the utilization of big data and predictive analytics on sustainable supply chain innovation. The study reported that conceptual framework linking the different elements and proposes a synthesis of the existing definitions of the used concepts. The study also reported that the role of absorptive capacity as enabler on Big Data and Predictive Analytics on sustainable supply chain innovation is stressed.

Raguseo, and Vitari (2017) aimed to explore the relationship between big data analytics and firm performance. They obtained data from 30 companies. They found that the business value achieved from investments in big data analytics leads to advantages in

terms of the financial performance of a firm. The results offer evidence of the existence of a customer satisfaction mediation effect and of the absence of a market performance mediation effect.

Wamba et al.,(2017) aimed to propose a big data analytics capability (BDAC) model. They explored the impact of big data analytics capability (BDAC) on firm performance (FPER). They obtained data from 297 Chinese IT managers and business analysts through using an online survey. They proposed a big data analytics capability (BDAC) model. They found that big data analytics capability (BDAC) has a significant impact on the firm performance. They found that process-oriented dynamic capabilities (PODC) have a significant mediating effect on the relationship between big data analytics capability (BDAC) and firm performance (FPER).

AL-Jaafreh and Fayoumi (2017) used qualitative methods (i.e. the interview method and the documents review) in three telecom companies in Jordan, with an opportunity to extend the study to different regions and countries. The study reported that understanding of how big data and its analysis are carried out by companies will support our effort in building more systematic procedures and guidelines for companies who wish to utilise big data for different types of innovation with different levels of maturity indicators.

Samuel and Wamba (2017) proposed a big data analytics capability (BDAC) model. Also, extends the research streams by examining the direct effects of BDAC on firm performance (FPER). They explored the mediating effects of process-oriented dynamic capabilities (PODC) on the relationship between BDAC and FPER. The findings confirm the value of the entanglement conceptualization of the hierarchical BDAC model, which has both direct and indirect impacts on FPER. The results also confirm the strong mediating role of PODC in improving insights and enhancing FPER.

Thirathon et al.,(2016) explored the impact of big data analytics (BDA) on decision making. They explored the impact of big data analytics (BDA) on performance. They collected data through a survey from 163 chief information officers and senior IT managers who were working in medium-to-large Australian for-profit organizations. They found that big data and big data analytics (BDA) contribute to improving performance in a direct and indirect manner. That is because they create an incentive for managers to rely on analytics when making strategic or operational decisions. The researchers found that big data analytics (BDA) improve the decision making process, because managers shall make decisions based on analytics.

Marfo and Boateng (2015) explored the potential of big data and dynamic capabilities in developing countries. The study identifies 6 broad categories that make up the classification of Big Data capabilities. The study also identifies the utility dimensions of big data such as organizational, managerial, and strategic benefits, IT infrastructure, and operational benefits. The study establishes a conceptual model for the capacity of big data which is currently being tested for the understanding and potential modification of experimental data. The study reported that big data capabilities are technological capabilities, data management capabilities, legal and ethical capabilities, analytical capabilities, data sharing capabilities, and decision-making capabilities.

Zheng et al (2011) explored the concept of dynamic capabilities from the knowledge-based perspective and investigate the mechanisms of dynamic capabilities on innovation performance in networked environments. They used a seven-point Likert questionnaire measuring the dynamic capabilities, innovation performance and network embeddedness. The sample consists of 218 Chinese manufacturing firms that were surveyed. The researchers found a significant relationships between dynamic capabilities and innovation

performance and knowledge combination capability played a mediating role in this relationship. They found also that knowledge acquisition capability was affected mainly by relational embeddedness and the diversity of network and joint problem solving contributed much to knowledge combination capability. Research limitations/implications.

Zahra and Gerard (2002) observe that most empirical studies show significant relationships between absorptive capacity and innovation output and other outcomes that pertain to create a competitive advantage. This research posits that potential capacity provides firms with the strategic flexibility and the degrees of freedom to adapt and evolve in the high-velocity environments, potential capacity allows forms to sustain a competitive advantage even in a dynamic industry context.

Several previous studies discussed the issue of big data, the absorptive capacity of knowledge, and the competitive performance of organizations and in different sectors. They shed a light on the importance of big data to increase corporate gains and performance in different sectors.

Some of these studies have examined big data and its relationship to the organization's performance such as Amirhm (2020); Khalil (2020); Yunus (2019); Zareravasan and Ashrafi (2019). Some studies have also measured the relationship between variables with each other such as Mikalef et al (2020); Othman (2019); Marfo and Boateng (2015); Zheng et al (2011).

The studies used different study methodologies. Some studies used the descriptive method of analysis by reviewing previous literature and drawing multiple conclusions such as Hassanein (2020); Qaisar et al (2020); Behl (2020); Makani and Shabila (2019).

Some studies relied on the analytical methodology applied through a questionnaire or a financial analysis of the outputs of companies ′work such as Amirhm (2020); Mikalef et al (2020); Khalil (2020); Yunus (2019); Othman (2019); Zareravasan and Ashrafi (2019); Elsirr (2018).

This study is distinguished from the previous literature. That is because this study is explores a new theme that is Big Data Dynamic Capabilities, which represents important topics in our global competitive business world, where banks need to meet new challenges and opportunities to enhance their competitive performance.

Moreover, even though Big Data Analytics Dynamic Capabilities and absorptive capacity are essential for gaining competitiveness, limited studies have been conducted in this field.

The thesis is significant because it sheds a light on the way in which the banks in Jordan deal with big data and use it at the workplace.

The study is distinguished from other studies because it was carried out in the Jordanian business environment in general and the banking sector in particular. The latter sector is a significant sector. It significantly affects the Jordanian economy and plays a major role in developing this economy. That is because this sector provides the Jordanian economy with much funds that are needed to achieve economic growth.

In addition, this study is working on the application of Big Data Dynamic Capabilities and absorptive capacity in relationship with competitive performance in the Jordanian Banking Sector, which is the most important field in our economy.

Chapter Three

The Study Methodology

3.1 Introduction

This chapter presents data about the study's methodology, population, sample, and procedures. It presents data about the validity and reliability of the study's tool. It also deals with the statistical procedures and methods that were used to arrive at the results of the study. The researcher also provided a brief view of some issues related to business research ethics.

3.2 Study Methodology

The researcher used the quantitative analytical approach. This approach is suitable for meeting the goals of this study. It involves a systematic collection for data related to a specific phenomenon through using standardized measures and carrying out statistical analysis (Hammarberg, et al., 2016).

Therefore, the researcher collected the necessary data based on this approach by reviewing the theoretical literature and previous studies, distributing the study tool represented by the questionnaire to the study sample, and conducting the statistical analysis to extract the required results.

The exploratory method used to carry out the cross-sectional survey design in order to collect the study data. Accordingly, the study methodology will pass the following stages:

- The first stage: Gathering the theoretical background related to the subject of study, through reviewing theoretical literature related to the subject of study.
- The second stage: the study selected the variables related to big data Dynamic Capabilities, knowledge Absorptive Capacity and Competitive performance.

The third stage: collecting data from the study population, and uncovering the impact of Big data Dynamic Capabilities and knowledge Absorptive Capacity on the Competitive performance in Jordanian banking sector. The community, sample, tools, procedures to verify their validity and reliability, as well as description of the procedures for their application, and the statistical treatments that have been implemented were described.

3.3 The Study Population and Sample

The population of the study involves all the Jordanian commercial banks that consist from (13) Jordanian commercial banks according to the Central Bank of Jordan (www.cbj.gov.jo). The sample consists of (IT management, executives and department heads) in the banks, and the sample size was determined according to (Sekaran and Bougie, 2016) which about (500) unit. Data on the study's population is shown below:

Table (3.1): The Target population – Jordanian Commercial Banks

No.	Banks name	Number of Branches	Employees
1.	Arab bank	84	3205
2.	Arab Banking Corporation (Jordan)	27	515
3.	Bank of Jordan	78	1555
4.	Cairo Amman Bank	75	1512
5.	Invest bank of Jordan	15	405
6.	Jordan Commercial Bank	33	730
7.	Jordan KuwaitBank	62	1225
8.	Jordan Ahli Bank PLC	53	1173
9.	The Housing Bank for Trade and Finance	125	2422

10.	Bank al Etihad	48	1139
11.	Societe Generale de Banque /Jordanie	20	316
12.	Arab Jordan Investment Bank	21	779
13.	Capital Bank of Jordan	16	573
	Total	657	15549

Sources: Central Bank of Jordan (www.cbj.gov.jo)

3.4 Sampling Technique

The selection of the sample was based on the higher categories of employees. The target employees are considered to be able to answer the questionnaire questions based on their work experience. Their expertise is related to the big data that banks employ in their various businesses.

3.5 Study Questionnaire and Measurement

The questionnaire is designed to include all the relevant variables, which consist of the independent, dependent and mediator variables that fit with the research hypotheses that have been formed. The tool consisted of (42) paragraphs as shown in Appendix No (1).

The theoretical literature and previous studies were relied upon to formulate the questionnaire statements, especially those that achieved proven reliability and validity. The researcher used the five Likert scale in the questionnaire which express the study sample answer on the questionnaire items according to the following classification: strongly agree, agree, neutral, disagree, strongly disagree).The score of these categories are: 1, 2, 3, 4 and 5 respectively.

3.6 Questionnaire Design

To meet the objectives of the present study, the theoretical literature and previous studies were reviewed. In addition, professors and experts were consulted to identify their views on the study's paragraphs and related fields to build the questionnaire in its final form. The tool consisted of four parts, the first related to demographic variables (gender, age, educational level, and experience).The second part related to big data Dynamic Capabilities which involves three variables. The third part related to Knowledge Absorptive Capacity. The fourth part related to Competitive Performance.

3.7 Operationalization of the Study Constructs

The questionnaire was developed based on the relevant literature related to the independent, dependent, and mediator variables. Those variables are shown below:

- **Independent variables:** Big data Dynamic Capabilities: Big data management, Technological Capabilities, Human capital.
- **Dependent Variables:** Competitive Performance: New Product Development Program (NPD), Market Performance, Financial Performance.
- **Intermediate Variable:** knowledge Absorptive Capacity: Potential absorptive capacity, Realized absorptive capacity.

The statements of the questionnaire were determined to be answered from the study sample, as shown below.

Table (3.2): The Construct and Measurement of Study Variables

Variables		Code Label	Measurements	References
Big data Dynamic Capabilities	Big data Dynamic Capabilities	BDDC1	Big data dynamic capabilities in our bank covers all areas of work and create new ways for working, communicating and cooperating.	Loebbecke, and Picot (2015)
		BDDC2	Big data analytic in our bank will harnessing quality data for designing and delivering innovative banking services	
		BDDC3	A bank creates greater value through using big data to make radical innovation rather than making incremental innovation.	Erevelles et al., 2016
		BDDC4	Our bank uses novel consumer insights that are extracted from big data to understand unmet consumer needs and enhance dynamic capability.	
		BDDC5	The banks that use inductive techniques in analyzing big data will be more capable to meet the information needs related to achieving success than the banks that use deductive techniques.	
	Big Data Management	BDM1	The bank has an excellent administrative capacity in the field of big data	Kitchin, 2014 Snijders et al., 2017
		BDM2	The bank provides much attention to the styles of big data management	
		BDDM3	The management of big data requires having a top management that is concerned in such management	
		BDM4	The administrative personnel have the knowledge and abilities that are required to use big data-driven applications	
		BDM5	The bank has various big data sources and strategies	
	Technological Capabilities	TC1	The bank has modern technological capabilities for managing big data	Hilbert, 2015
		TC 2	The bank management is keen on acquiring the latest applications related to the management of big data at the global level	
		TC 3	The bank management allocates a percentage of the annual budget for	

			supporting the process of acquiring modern electronic technologies	Teece,
		TC 4	High-quality technologies are important to carry out the day-to-day business operations of the bank and control the data and information about customers. They are important to control data about the annual results of the bank.	Pisano, and Shuen, 1997
		TC 5	The bank updates the technological capabilities periodically through acquiring the latest technologies in the field of big data management	
	Human Capital	HC1	The bank is distinguished by having efficient and effective human capital	Miaha et al., 2017 Erevelles et al., 2016
		HC 2	The bank personnel have much experience in terms of using big data applications	
		HC 3	The bank personnel have much experience in terms of handling and analyzing data in the business field	
		HC 4	Employees are provided with training courses about handling data in a regular basis	
Variables		**Code Label**	**Measurements**	**References**
Knowledge Absorptive Capacity	Potential Absorptive Capacity	PAC1	Our bank has the tools needed to enhance the knowledge that improve its competitiveness.	Flatten et al., 2011 Schreiber and Carley, 2008
		PAC 2	Our employees are able to apply new knowledge for doing their practical tasks	
		PAC 3	Our management provides employees with enough cope for development to use the aggregated information for experimenting with alternative solution possibilities	
		PAC 4	Our bank regularly reconsiders technologies and adapts them in accordance with the new knowledge.	
		PAC 5	Our bank launches innovative services promptly to improve the research and development “RandD” results	
		RAC1	Our management encourages employees to generate knowledge	Flatten et al., 2011
		RAC 2	Our bank strives to use innovative ideas to get patents.	

	Realized Absorptive Capacity	RAC 3	Our management encourages employees to merge the ideas provided by several departments	Rodriguez et al., 2014
		RAC 4	Our employees successfully link the existent knowledge with new insights	
		RAC 5	Our employees are used to absorbing new knowledge as well as to preparing it for meeting specific goals and making the knowledge available.	
Variables		**Code Label**	**Measurements**	**References**
Competitive Performance	New Product Development Program (NPD)	NPDP 1	Our new services development program has met our bank objectives	Tzokasa, et al (2015)
		NPDP 2	The bank has a competitive program to develop banking services	
	Market Performance	MP 1	The bank makes customers satisfied	Tzokasa, et al (2015)
		MP 2	The bank meets the customer needs	
		MP 3	The bank retains valued customers	
	Financial Performance	FP 1	The bank reaches he intended business profitability	Tzokasa, et al (2015)
		FP 2	The bank meets the intended financial goals	
		FP 3	The bank reaches the intended return on investment (ROI)	
		FP 4	The bank reaches the intended return on sales (ROS)	

3.8 Construct Measurements

Reliability and validity are concepts used to evaluate the quality and accuracy of the instruments used in the study.

3.9 Reliability

Reliability is defined as a test of how consistently a measuring instrument measures whatever concept it is measuring, it refers to stability and internal consistency (Sekaran and Bougie, 2016).The reliability of the study's questionnaire was measured through calculating the Cronbach alpha coefficient value

3.10 Validity

Validity refers to how well the instrument measures what it is intended to measure. Further, it refers to appropriateness, the accuracy of the analysis, measurements, testing, and interpretation (Sekaran and Bougie, 2016).The validity of the scale also refers to the capability of the questionnaire to measure what's intended to measure. It was measured through passing the initial version of the questionnaire to several experts from Jordanian university in order to assess it as shown in Appendix No (1).

3.11 The Study Ethics

Ethics refer to the code of conduct that govern one's behavior and prevent one from infringing the rights of the ones who are targeted by one's work and the ones who are influenced by one's work (Saunders, et al., 2016). Sekaran and Bougie (2016) add that the researchers conducting an analysis, and the respondents providing researchers with data must comply with ethics. They add that the analysts providing the researchers with findings must comply with ethics. They add that all the people involved in the processes of presenting and interpreting the findings and proposing alternative solutions must comply with ethics.

It should be noted that the researchers must comply with ethics starting from the stage of selecting the research problem and examining the potential impact and results of their research (Leavy, 2017).

The codes of ethics include several principles which researchers must comply with. These principles are presented in the table (3.3).

Table (3.3): The ethical principles and ethical rationales

No.	**Ethical principle**	**Ethical rationale**
1.	The researchers' integrity and objectivity	That means that researchers must be honest, and precise and keen on present the truth only. It also means that researchers must prevent deceit, dishonesty, and misrepresentation of facts
2.	Avoiding harm	That means that researchers must refrain from causing harm, embarrassment, pain, and discomfort to any participant and harassing any participant. It means that researchers must refrain from putting any participation under stressful situation and practicing discrimination against participants.
3.	Showing respect for others	This means that researchers must respect the dignity and rights of the participants.
4.	Protecting the participants' privacy	This means that researchers must protect the privacy of participants, and ensure that the collected data remain confidential. It means that researchers must ensure that participants' identities remain anonymous.
5.	Granting the participants the right to participate willingly in the study and	That means that researchers must grant the participants the right to participate willingly in the study without harassing the participants. Researchers must grant the

	the right to withdraw from participating in the study	participants the right to withdraw from participating in the study. Participants have the right to determine which questions they want to answer.
6.	Handling responsibilities when analyzing data and reporting of findings	When reporting and analyzing data, guarantees must be provided for preserving the confidentiality of data and the participants' privacy, and keeping the participants' identities anonymous. Primary data should not be compiled nor manipulated. There shouldn't be any false information included in the research.
7.	Compliance with the legal rules when managing data	Researchers must comply with the legal rules and legislations that are related to research management and considered applicable in the country they are carrying out the research at.

Chapter Four

Data Analysis and Results

4.1: Introduction

This chapter presents a detailed and explanatory description of the results of data analysis through the study tool that was used (the questionnaire). This chapter explains the characteristics of the study sample, descriptive statistics for the constructs used in this study, measurement model and structural model. SPSS V.25 and Smart- software were used. PLS in order to test the study model and the hypotheses that were assumed in this study.

4.2: Study population and sample

The study population consisted of all (13) Jordanian commercial banks according to the website of the Central Bank of Jordan (www.cbj.gov.jo). As for the unit of analysis, it was the administrative level in these banks, where the questionnaire was distributed to each of (IT management). , executives and department heads), and as for the study sample, it was identified through tables (Sekaran and Bougie, 2016) with 377 responses, and the random sampling method was used as a method of statistical sampling, and the questionnaire was distributed through the Google forms website and by distributing it directly and in paper On the study sample, (360) questionnaires were received with (32) paper questionnaires and (328) electronic questionnaires.

4.3: Demographic characteristics of the study sample

Table (4-1) shows the characteristics of the demographic study sample in terms of (gender, age, administrative level, educational level, experience).

Table (4.1): The main characteristics of the participating respondents

Respondents Characteristics		Frequency	Percentage
Gender	Male	204	56.7%
	Female	156	43.3%
Age	Under 25 years old	15	4.2%
	From 25 to under 35 years old	142	39.4%
	From 35 to under 45 years old	135	37.5%
	over 45 years old	68	18.9%
Managerial level	General manager	8	2.2%
	Deputy General Manager	16	4.4%
	Executive Director	59	16.4%
	Branch Manager	62	17.2%
	Head of the Department	85	23.6%
	Another supervisory job	130	36.1%
Educational level	Ph.D.	40	11.1%
	Master	78	21.7%
	Bachelor	233	64.7%
	Higher diploma	9	2.5%
Experience	less than 5 years	31	8.6%
	From 5 - 10 years	116	32.2%
	More than 10 years	213	59.2%
Total		360	100%

It is evident from the table (4-1) that the demographic characteristics of the study sample members were distributed among the demographic variables as follows:

1- Gender:

The number of males responding to the questionnaire was 204, with a percentage of 56.7%, and the number of females was 156, with a percentage of 43.3%.

2- Age:

The number of individuals responding to the questionnaire whose age was less than 25 years was 15 individuals, with a percentage of 4.2%. As for the number of individuals responding to the questionnaire whose ages were between 25 to less than 35 years, their number was 142 individuals, with a percentage of 39.4%. As for the number of respondents who were aged From 35 years to less than 45 years, their number was 135 individuals, with a percentage of 37.5%, and finally, the number of respondents who were over 45 years old was 68 individuals, with a percentage of 18.9%.

3- Managerial level:

The number of respondents to the questionnaire who worked as a general manager was 8 individuals, at a percentage of 2.2%. The number of respondents to the questionnaire who worked as a deputy general manager was 16, with a percentage of 4.4%. The number of respondents to the questionnaire who worked as an executive director was their number was 59 individuals, with a percentage of 16.4%. As for the number of individuals who responded to the questionnaire who worked as a branch manager, their number was 62 individuals, with a percentage of 17.2%. As for the number of individuals who responded to the questionnaire who worked as a department head, their number was 85 individuals, with a percentage of 23.6%. Individuals who responded to the questionnaire who were working in other supervisory positions, their number was 130, or a percentage of 36.1%.

4- Educational level:

The number of individuals who responded to the questionnaire from holders of a bachelor's degree was 233 individuals, with a percentage of 64.7%. The number of individuals who responded to the questionnaire among holders of a master's degree was 78 individuals, with a percentage of 21.7%. The number of individuals who responded to

the questionnaire from holders of a higher diploma was 9 individuals, with a percentage of 2.5% as for the number of individuals who responded to the questionnaire from holders of doctorate degrees, 40 individuals, with a percentage of 11.1%.

5- Experience:

The number of individuals responding to the questionnaire whose experience was less than 5 years was 31 individuals, with a percentage of 8.6%. The number of individuals responding to the questionnaire whose experience was from 5-10 years was 116 individuals, with a percentage of 32.2%. The number of individuals responding to the questionnaire whose experience was more than 10 years was 213 individuals, with a percentage of 59.2%.

4.4 Descriptive statistics for the study variables

The researcher conducted descriptive statistics for the study variables, as it relied on measures of central tendency (mean) and measures of dispersion (standard deviation) in order to calculate the level of importance for each construct of the study. To evaluate the importance level for each construct, the researcher divided the importance level into three levels as follows: low (1-2.33), medium (2.34-3.66), and high (3.67-5). Table (4-2) shows the results of descriptive statistics

Table (4.2): descriptive analysis of the Study Main constructs

Construct	Mean	Standard Deviation	Importance level
BDM management	3.84	0.638	High
BDA technology capabilities	3.95	0.596	High
BDA Human capital	3.85	0.648	High
Big data analytics dynamic capabilities	4.11	0.541	High
Realized absorptive capacity	3.90	0.590	High
Potential absorptive capacity	3.86	0.594	High
Competitive performance	4.07	0.514	High

Table (4-2) shows the descriptive statistics of the constructs of the study, where the mean of the constructs ranged (3.84-4.11) and all of them had high levels of importance, and it was found that the highest mean reached (4.11) with a standard deviation (0.541) and a high level of importance for Big data analytics dynamic capabilities The lowest of these constructs in terms of mean BDM management with an mean (3.84), a standard deviation (0.638) and a high level of importance.

4.5 Data analysis and hypothesis testing

Data analysis was carried out using SPSS V.25 software and Smart-PLS V3.2 software, where it was relied on SPSS V.25 software to encode the study data, conduct descriptive statistics tests for the members of the demographic study sample, and conduct descriptive statistics for the study constructs. As for inferential statistics tests, such as validity and reliability tests and hypothesis tests, they were conducted using Smart-PLS V3.2 software.

4.5.1: Measurement model

The Structural Equation Modelling SEM is intended to test the Measurement model and Structural Model (Hair et al., 2010) where the Measurement model focuses on calculating convergent validity and Discriminant validity (Fornell and Larcker, 1981) and also ensuring internal consistency.

First: convergent validity

Table (4-3) reviews factor loadings and average variance extracted AVE values for convergent validity. Calculation of Cronbach alpha and Composite reliability was performed to calculate the reliability of the questionnaire items and for internal consistency validity. According to the recommendations of (Hair et al., 2019; Hair et al., 2014; Fornell and Larcker, 1981), the convergent validity tests should be as follows:

1. Factor loadings: The value of Factor loadings for the constructs items must be (0.70) and greater, and any value less than (0.70) is omitted from the final model.
2. Average Variance Extracted AVE: The AVE measure represents the average variance extracted for a number of items that make up the construct, and the statistically acceptable value for this test must be (0.50) and greater, where whenever

the value of the AVE is greater than (0.50), this means that the items are able to explain this construct. This indicates that convergent validity has been achieved on the construct's items

3. Cronbach alpha: The Cronbach alpha test is considered one of the traditional tests to ensure the internal consistency of the items of the questionnaire. This test explains the stability of the results over time for the same group of people, as the reliable scale must be stable and give almost the same results if it is repeated. The same group again later. According to the recommendation of (Hair et al., 2019; Hair et al., 2014), the statistically acceptable value is (0.70).
4. Composite reliability: one of the tests that reveal the reliability of the questionnaire items and through which to check the internal consistency. It is commonly used in SEM test models and according to (Hair et al., 2019; Hair et al., 2014) the statistically acceptable value (0.70) and greater.

Table (4-3) shows the results of the convergent validity test

Table (4.3): convergent validity and reliability of constructs

Construct	Item code	Loadings	Cronbach alpha	Composite reliability	AVE
Big data analytics dynamic capabilities	BDDC1*	-	0.783	0.860	0.606
	BDDC2	0.715			
	BDDC3	0.824			
	BDDC4	0.812			
	BDDC5	0.758			
BDA management	BDM1*	-	0.757	0.860	0.672
	BDM2	0.782			

	BDM3*	-			
	BDM4	0.831			
	BDM5	0.845			
BDA technology capabilities	TC1*	-	0.764	0.849	0.584
	TC2	0.771			
	TC3	0.764			
	TC4	0.770			
	TC5	0.752			
BDA Human capital	HC1	0.737	0.819	0.881	0.651
	HC2	0.868			
	HC3	0.846			
	HC4	0.769			
Realized absorptive capacity	RAC1	0.732	0.839	0.886	0.609
	RAC2	0.780			
	RAC3	0.849			
	RAC4	0.740			
	RAC5	0.796			
Potential absorptive capacity	PAC1	0.740	0.789	0.864	0.613
	PAC2*	-			
	PAC3	0.781			
	PAC4	0.833			
	PAC5	0.776			
Competitive performance	NPDP1*	-	0.815	0.866	0.519
	NPDP2*	-			

	MP1	0.763			
	MP2	0.707			
	MP3	0.715			
	FP1	0.707			
	FP2	0.721			
	FP3	0.707			
	FP4*	-			

* Removed item

It is clear from the results in Table (4-3) that all values of convergent validity test were acceptable according to the recommendation of (Hair et al., 2019; Hair et al., 2014; Fornell and Larcker, 1981), where the Factor loadings values ranged (0.707-0.868) In order to improve convergent validity, any item whose factor loading was less than (0.70) were deleted: (BDDC1, BDM1, BDM3, TC1, PAC2, NPDP1, NPDP2, FP4). As for the AVE values, they ranged (0.519-0.672) and all of these values were higher than (0.50), and therefore convergent validity is valid. As for the validity of the internal consistency, the values of the Cronbach alpha test were (0.757-0.839) and the values of the Composite reliability test were (0.849-0.886), meaning that all the values were higher than (0.70). Therefore, the questionnaire items are reliable and the internal consistency has been achieved.

Second: Discriminant validity

Discriminant validity is defined as “that which is established when two variables are theorized to be uncorrelated, and the scores obtained by measuring them are empirically found to be so” (Sekaran and Bougie, 2016). Discriminant validity is one of the most important steps that must be taken before Moving on to the structural model.

Discriminant validity was confirmed by three tests: Cross-loading, Fornell and Larcker method, and Heterotrait-Monotrait Ratio HTMT.

1. Cross-loading test: It is considered one of the common tests of Discriminant validity test and that the test rule should be indicators outer loading on the associated constructs are greater than all of its loading on other constructs (Henseler et al., 2015).
2. Fornell and Larcker method: One of the oldest methods that has been developed to measure Discriminant validity according to this method, the square root of the average variance extracted from each construct should exceed the highest constructs correlation with any other constructs (Henseler et al., 2015).
3. Heterotrait-Monotrait Ratio HTMT: This method is considered as one of the new methods for assessing and measuring Discriminant validity (Henseler et al., 2015). This method is based on that the test value between constructs should not exceed (0.90).

The following tables show the results of the Discriminant validity tests.

1- Cross-loading test:

Table 4.4 : Cross-Loading of the Construct

Indicator	HC	BDM	TC	BDDC	CP	PAC	RAC
BDDC2	0.189	0.256	0.277	**0.715**	0.276	0.261	0.296
BDDC3	0.316	0.366	0.291	**0.824**	0.326	0.364	0.376
BDDC4	0.293	0.354	0.289	**0.812**	0.306	0.385	0.341
BDDC5	0.273	0.366	0.350	**0.758**	0.313	0.360	0.370
BDM2	0.470	**0.782**	0.508	0.311	0.341	0.427	0.504
BDM4	0.504	**0.831**	0.461	0.369	0.376	0.533	0.516
BDM5	0.474	**0.845**	0.576	0.386	0.371	0.580	0.513
FP1	0.285	0.340	0.255	0.259	**0.707**	0.358	0.439
FP2	0.306	0.297	0.234	0.245	**0.721**	0.326	0.340
FP3	0.285	0.340	0.325	0.226	**0.707**	0.342	0.384
HC1	**0.737**	0.45	0.379	0.256	0.377	0.47	0.48
HC2	**0.868**	0.48	0.46	0.319	0.372	0.522	0.583
HC3	**0.846**	0.486	0.471	0.25	0.388	0.548	0.594
HC4	**0.769**	0.481	0.507	0.29	0.368	0.553	0.554
MP1	0.402	0.378	0.361	0.329	**0.763**	0.458	0.49
MP2	0.363	0.313	0.295	0.281	**0.707**	0.383	0.422
MP3	0.35	0.251	0.353	0.34	**0.715**	0.34	0.427
PAC1	0.518	0.499	0.44	0.271	0.399	**0.74**	0.521
PAC3	0.54	0.499	0.391	0.274	0.434	**0.781**	0.556
PAC4	0.507	0.541	0.496	0.422	0.381	**0.833**	0.574
PAC5	0.473	0.441	0.475	0.416	0.403	**0.776**	0.53

RAC1	0.517	0.438	0.461	0.246	0.444	0.504	**0.732**
RAC2	0.559	0.504	0.409	0.301	0.47	0.547	**0.78**
RAC3	0.524	0.553	0.543	0.358	0.517	0.588	**0.849**
RAC4	0.503	0.424	0.556	0.441	0.422	0.466	**0.74**
RAC5	0.577	0.5	0.59	0.399	0.427	0.603	**0.796**
TC2	0.523	0.565	**0.771**	0.304	0.353	0.452	0.576
TC3	0.513	0.532	**0.764**	0.261	0.282	0.525	0.517
TC4	0.288	0.393	**0.77**	0.335	0.366	0.297	0.418
TC5	0.431	0.446	**0.752**	0.277	0.286	0.523	0.509

Table (4-4) refers to the Cross-Loading test to verify Discriminant validity, and it turns out that all indicators outer loading on the associated construct are greater than all of its loading on other constructs, and therefore, according to this method, it can be judged on Discriminant validity.

2- Fornell and Larcker method:

Table (4.5): Latent Construct Correlations

	HC	BDAM	TC	BDDC	CP	PAC	RAC
HC	0.807						
BDAM	0.588	0.820					
TC	0.565	0.629	0.764				
BDDC	0.349	0.436	0.388	0.778			
CP	0.465	0.443	0.426	0.393	0.720		
PAC	0.649	0.632	0.576	0.445	0.515	0.783	
RAC	0.687	0.622	0.656	0.447	0.585	0.697	0.781

It is clear from Table (4-5) Discriminant validity of the study constructs, as it can be seen from the results presented in Table (4-5) Discriminant validity through the method (Fornell and Larcker, 1981), which states "The square root values of the AVE value must be The variable is greater than the correlation values between the variable and the other variables of the study", and by looking at the results presented in the previous table, it is clear that the square root values of AVE, which are shown in bold, were greater than the correlations between each variable and the other variables, and therefore, Discriminant validity is verified by the construct of the study.

3- Heterotrait-Monotrait Ratio HTMT:

Table (4.6): HTMT test

	HC	BDAM	TC	BDDC	CP	PAC	RAC
HC							
BDAM	0.749						
TC	0.724	0.831					
BDDC	0.426	0.557	0.496				
CP	0.566	0.560	0.527	0.485			
PAC	0.810	0.811	0.755	0.527	0.637		
RAC	0.829	0.780	0.825	0.549	0.699	0.854	

It is evident from Table (4-6) the HTMT test to evaluate the Discriminant validity between the constructs, and it is clear from the results presented in Table (4-6) that all the values were less than (0.90) and according to (Hair et al., 2019) The Discriminant validity is verified

4.5.2: Multicollinearity test

This test is one of the important tests that must be confirmed before using multiple linear regression or testing the study hypotheses through SEM, as the presence of this

problem in the independent variables leads to problems in estimating the regression equation and also creates a pseudo-regression problem. The value of VIF must be less than (5) in order to judge the absence of this problem in the independent variables.

Table (4-7): Multi collinearity test

Independent variable	VIF
Big data analytics dynamic capabilities	1.306
Potential absorptive capacity	2.030
Realized absorptive capacity	2.035

Table (4-7) shows the results of the VIF test, where the test values ranged (1.306-2.035), and therefore the values were within the statistically permissible range, and therefore it can be judged that the independent variables are free of the multicollinearity problem.

4.5.3: Structural model

Smart-PLS software provides bootstrapping technique , which is one of the flexible methods when testing relationships between exogenous constructs and endogenous constructs (Streukens and Leroi-Werelds, 2016). Partial Least Squares provided by Smart-PLS software does not need statistical requirements according to For parametric methods, as the PLS method is considered one of the non-parametric methods, and therefore, there is no need to provide a normal distribution condition and other conditions such as a large sample size

To test the hypotheses of the study and to verify the statistical significance of the relationships between exogenous constructs and endogenous constructs, the values of R^2,

the values of the path coefficients (beta), empirical t values and the P-values were calculated.

To support the hypothesis that has been hypothesized, which is the alternative hypothesis, the empirical value of the t-test must be equal to (1.96) or greater and the P-value should be less than (0.05).

The results of hypothesis testing are summarized in both picture (4-1) which shows the values of path coefficients, R^2 values and factor loadings values, as well as picture (4-2) which shows the experimental t values.

The results of testing the study's hypotheses and the direct relationships between the constructs were as summarized in Table (4-8) where all direct hypotheses were supported.

Table (4-8): Results of testing the study hypotheses

Path	Path coefficient	t-Statistic	P-Value	Result
BDDC⇒CP	0.136	2.476	0.014	H1:support
BDDC⇒PAC	0.445	9.845	0.000	H2: support
BDDC⇒RAC	0.171	3.434	0.001	H3: support
PAC⇒RAC	0.620	12.428	0.000	H5: support

By summarizing the results shown in Figure (4-1), it is evident that the endogenous construct (Competitive performance) has reached the variance due to exogenous constructs (Big data analytics dynamic capabilities, Realized absorptive capacity, Potential absorptive capacity) has reached (37.9%), as The value of R^2 was (0.379). As for the endogenous construct (realized absorptive capacity), the value of R^2 was (0.509), as the exogenous construct (Big data analytics dynamic capabilities, Potential absorptive

capacity) affected the realized absorptive capacity with a value of (50.9%), and finally, the value of R^2 of the endogenous construct (potential absorptive capacity) which is caused by the exogenous construct (Big data analytics dynamic capabilities) (0.198), that is, the value of the variance in the potential absorptive capacity caused by the Big data analytics dynamic capabilities was (19.8%).

The results of the hypothesis testing were as follows:

H1: Big data dynamic capabilities have a positive direct impact on the competitive performance.

The result of testing the effect of the exogenous construct (Big data dynamic capabilities) on competitive performance was as follows: (β=0.136, t=2.476, p-value=0.014) and thus H1 was supported.

H2: Big data dynamic capabilities have a positive impact on the potential absorptive capacity.

The result of testing the impact of the exogenous construct (Big data dynamic capabilities) on the potential absorptive capacity. Was: (β=0.445, t=9.845, p-value=0.000) and thus H2 was supported.

H3: Big data dynamic capabilities have a positive impact on the realized absorptive capacity.

The result of testing the impact of the exogenous construct (Big data dynamic capabilities) on the realized absorptive capacity was as follows: (β=0.171, t=3.434, p-value=0.001) and thus H3 was supported.

H5: Potential absorptive capacity has a positive impact on the Realized absorptive capacity

The result of testing the effect of the exogenous construct (potential absorptive +32U'

45 K,capacity) on realized absorptive capacity was as follows: (β=0.620, t=12.428, p-value=0.000) and thus H5 was supported.

Fig (4-1): Structural model and R^2, path coefficient values

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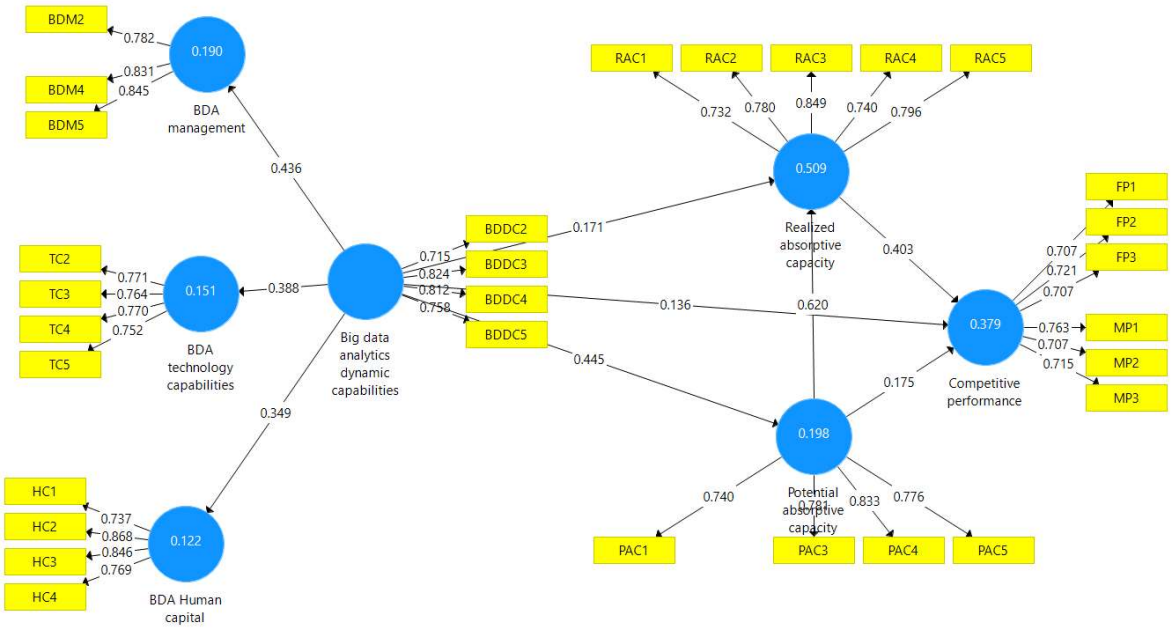
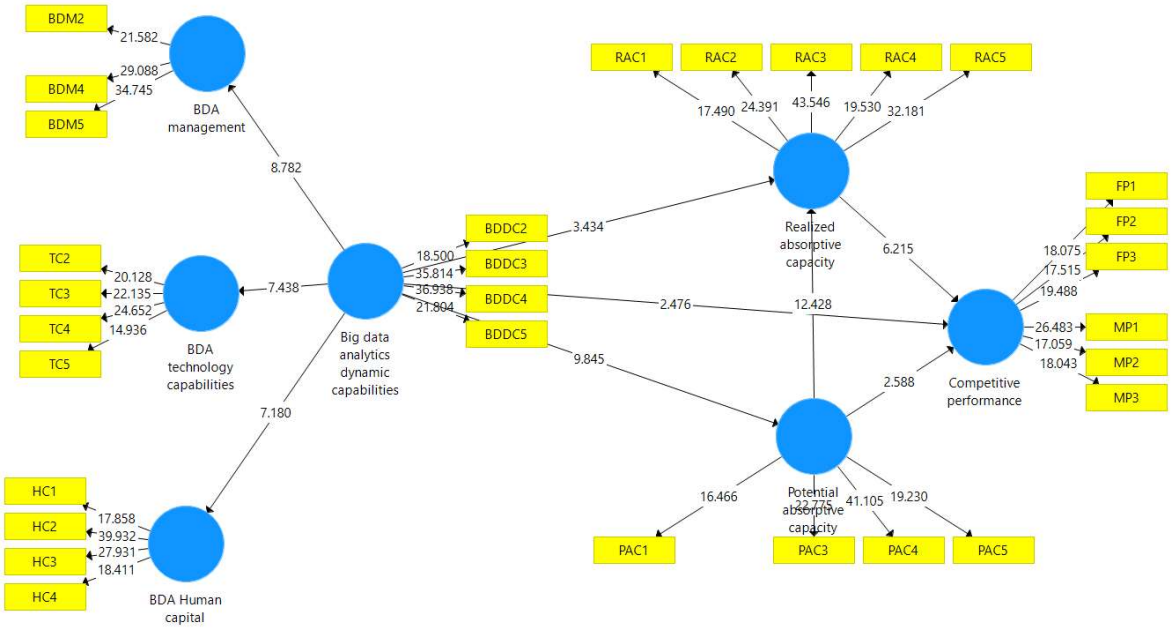


Fig (4-2): Structural model and t- values



H4: Big data dynamic capabilities have a positive impact on the competitive performance through potential absorptive capacity and realized absorptive capacity.

To test H4 and find out the mediating role for each of the potential absorptive capacity and realized absorptive capacity in the relationship between big data dynamic capabilities and competitive performance, (preacher and Hayes, 2008) procedure was used by calculating the indirect impact and calculating confidence intervals where zero should not interrupt upper and lower confidence intervals. And table (4-9) shows the results of the H4 test.

Table (4-9): Results of testing the mediation analysis

Path	***In direct Path coefficient***	***95% LL***	***95% UL***	***t-Statistic***	***P-Value***	***Result***
BDDC⇒PAC⇒CP	0.078	0.016	0.142	2.447	0.015	H4: Supported
BDDC⇒RAC⇒CP	0.069	0.028	0.126	2.755	0.006	

Table (4-9) refers to the test of hypothesis H4, which tests the mediating role for both potential absorptive capacity and realized absorptive capacity in the relationship between Big data dynamic capabilities and competitive performance. It is clear from the test results that the indirect effect of the relationship between Big data dynamic capabilities and Competitive performance through the potential absorptive capacity was (0.078) and the confidence intervals for this value were (0.016-0.142) and since zero was not within the confidence intervals and it was (t=2.447, p-value=0.015), this indicates that the potential absorptive capacity is playing A mediating and positive role in the relationship between Big data dynamic capabilities and competitive performance.

As for the relationship between Big data dynamic capabilities and competitive performance through the realized absorptive capacity, the indirect effect value was (0.069), and the confidence intervals for this value were (0.028-0.126), since zero was not within the confidence intervals and it was (t=2.755, p- value=0.006), this indicates that realized absorptive capacity plays a positive and mediating role in the relationship between Big data dynamic capabilities and competitive performance.

Chapter Five

Conclusion, Discussion, Implications, Limitations, Future Research and Recommendations

5.1 Introduction

This chapter reviews the most important results that have been reached through statistical analysis and the statistical tools that were used in this study. And also discussing the results of the study and the most important recommendations that were reached and reviewing the most important recommendations related to future studies

5.2 Discussion and Implications

First: The results of the study confirmed the existence of a statistically significant effect of Big data dynamic capabilities on competitive performance in Jordanian commercial banks, where Big data dynamic capabilities employ the best administrative and organizational practices that help banks develop their products and services in a way that improves their competitive performance, and plays These capabilities of big data in understanding the requirements, needs and desires of customers in order to achieve their long-term satisfaction and lead to an increase in the market share of banks, and this raises the level of competitive performance of these banks. The results of the study agreed with the study (Singh and Giudice, 2019) and the study (Wamba, 2017). And the study (Mikalef et al., 2020), which emphasized the important role of big data dynamic capabilities in improving the organizational performance of companies and their competitive performance as well.

Second: The results of the study indicated that there is a statistically significant impact of big data dynamic capabilities on potential absorptive capacity, as big data dynamic capabilities are considered one of the main factors that encourage companies and help them improve their products and services by exploiting the existing knowledge of employees by employing their ideas. and documenting innovation through patents or

other methods of intellectual property protection. Big data dynamic capabilities help banks and companies to provide new and useful ideas for all departments of the company, and the results of the study agreed with the study (Rodriguez and Da Cunha, 2018).

Third: The results of the study indicated the existence of a statistically significant impact of Big data dynamic capabilities on realized absorptive capacity, as Big data dynamic capabilities are considered one of the main pillars in organizing and generating big data and benefiting from them in generating new knowledge that did not previously exist within these organizations. The capabilities within the big data analytics that companies and banks use can help to reach new knowledge and exploit it in an optimal way and to use and exploit this knowledge to come up with new innovations that help organizations achieve a high strategic position compared to competitors. The results of the study agreed with the study of (Rodriguez and Da Cunha,2018).

Fourth: The results of the study confirmed the existence of a statistically significant effect of potential absorptive capacity on realized absorptive capacity. The results of the study agreed with the study (leal-Rodriguez et al., 2014) and the study (Fosfuri and Tribó, 2008), which confirmed the existence of a strong relationship between These two variables are confirmed by a study (Yaseen, 2019) that the presence of potential absorptive capacity and realized absorptive capacity in companies will improve their innovative ability and increase their organizational and innovative performance.

Fifth: The results of the study showed that Potential absorptive capacity and Realized absorptive capacity play a mediation and statistically significant role between big data dynamic capabilities and competitive performance. The results of the study supported the management view based on learning, as the presence of analytical capabilities for big data is not sufficient to increase competitive performance, as Knowledge creation, transfer and

utilization within organizations will improve competitive performance along with big data analytics and organizational capabilities capable of transforming big data into useful data that can be used for business purposes.

5.3 Recommendations

Based on the results of the statistical analysis and discussion of the results, the following recommendations were made:

1. Recommending the managers of Jordanian commercial banks to pay attention to the infrastructure that focuses on improving the big data dynamic capabilities in banks to increase the use of BDA in these banks.
2. Managers in Jordanian commercial banks should help create an innovative work environment and an organizational culture based on interest in banks' initiatives towards big data analytics by training employees on the best assistive technology on big data analytics.
3. Managers in Jordanian commercial banks should plan and invest directly in the exploitation of big data by explaining the importance of this technology to stakeholders and persuading them to pump sufficient financial liquidity to improve the exploitation of this technology.
4. Managers in Jordanian commercial banks should hear the voices of their employees regarding improving innovation by allowing them to implement their ideas on the ground.
5. Managers in Jordanian commercial banks should seize, acquire and transform external opportunities related to knowledge into a normal activity within the organization, in order to improve the position of the banks in front of their competitors.

6. Managers in Jordanian commercial banks must use the best technological and administrative methods to achieve the optimum use of knowledge, such as documenting and preserving it from loss.

5.4 Limitations

Despite the theoretical and practical importance of this study, it was exposed to many methodological limitations that may affect the generalization of the results. Therefore, the researcher suggested recommendations for researchers to get rid of these restrictions in the future:

1. This study was based on a questionnaire and the study time scope was cross-sectional, so it is useful to conduct studies that take into account the passage of time and the change of results over time, so researchers can conduct longitudinal studies in the future that help to generalize the results better.
2. The study focused on the study of constructs in terms of direct effect and mediating effect. In the future, it will be useful to study several constructs in different ways, such as studying knowledge sharing as a moderator, demographic characteristics as a moderator variable, or studying financial performance quantitatively.
3. In this study, the questionnaire was relied on as a tool for data collection, and despite the importance of the questionnaire as a tool for data collection, it may be useful if interviews or published secondary sources were used to analyze them to come up with new results that could improve the theoretical and administrative practices related to the subject of the study.
4. The scope of the study was the Jordanian commercial banks, and despite the importance of this sector in the Jordanian economy, we may not understand more the importance of big data and its analysis on performance through one sector, so it

is useful to conduct studies on other sectors such as the industrial sector, the non-financial service sector and other economic sectors.

5.6: Future Studies

Many future studies can be conducted on many contexts other than this context. It is useful to conduct other studies that take into account the presence of new variables in the study model, such as organizational culture and organizational agility. It is possible to collect data through qualitative methods such as interviews with managers and officials in Jordanian commercial banks and to develop proposals and recommendations based on these interviews

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Appendix (A): Questionnaire

English Version

Al-Zaytoonah University

Faculty of Business
Business Administration Department

Dear Participants,

The researcher is conducting a study entitled The impact of Big data Dynamic Capabilities and knowledge Absorptive Capacity on the Competitive performance: Applied study in the Jordanian banking sector., in order to complete the Master's degree in Business Administration (MBA) from Al-Zaytoonah University, Faculty of Business, Business Administration Department.

So kindly give a part of your time to answer questions of the attached questionnaire, taking into consideration that the information submitted by you will be treated confidentially, and only used for the purposes of scientific researches.

Thank you for participating in this research.

Supervisor
Prof. Dr. Sa'ad G. Yaseen

Researcher
Rami Ahmad Abdel Rasoul Issa

Part one: Demographic characteristics.

Please mark (√) in the appropriate box:

1. Gender

- Male
- Female

2. Age:

- Less than 25 years old
- 25 –35
- 35 – 45
- 45 years old and more

3. Educational level:

- Bachelor
- Master
- PhD
- High Diploma

4. Total years of experience in the bank

- Less than 5 years
- 5 – 10
- More than 10 years

5. Job Position

- CEO
- Deputy CEO
- Executive Director
- Branch / center manager
- Head of department / unit
- Another supervisory job

Part two: Questionnaire statements.

Please indicate the extent to which you agree or disagree with each of the following statements by marking with a cross (X) in the appropriate box:

Big data Dynamic Capabilities						
No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
A.	Big data Dynamic Capabilities:					
1.	Big data dynamic capabilities in our bank covers all areas of work and create new ways for working, communicating and cooperating.					
2.	Big data analytic in our bank will harnessing quality data for designing and delivering innovative banking services					
3.	A bank creates greater value through using big data to make radical innovation rather than making incremental innovation.					
4.	Our bank uses novel consumer insights that are extracted from big data to understand unmet consumer needs and enhance dynamic capability.					
5.	The banks that use inductive techniques in analyzing big data will be more capable to meet the information needs					

	related to achieving success than the banks that use deductive techniques.					
B.	Big Data Management					
6.	The bank has an excellent administrative capacity in the field of big data					
7.	The bank provides much attention to the styles of big data management					
8.	The management of big data requires having a top management that is concerned in such management					
9.	The administrative personnel have the knowledge and abilities that are required to use big data-driven applications					
10.	The bank has various big data sources and strategies					
C.	Technological Capabilities:					
11.	The bank has modern technological capabilities for managing big data					
12.	The bank management is keen on acquiring the latest applications related to the management of big data at the global level					
13.	The bank management allocates a percentage of the annual budget for					

	supporting the process of acquiring modern electronic technologies					
14.	High-quality technologies are important to carry out the day-to-day business operations of the bank and control the data and information about customers. They are important to control data about the annual results of the bank.					
15.	The bank updates the technological capabilities periodically through acquiring the latest technologies in the field of big data management					
D.	Human Capital					
16.	The bank is distinguished by having efficient and effective human capital					
17.	The bank personnel have much experience in terms of using big data applications					
18.	The bank personnel have much experience in terms of handling and analyzing data in the business field					
19.	Employees are provided with training courses about handling data in a regular basis					

Knowledge Absorptive Capacity						
No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
A.	Potential Absorptive Capacity					
20..	Our bank has the tools needed to enhance the knowledge that improve its competitiveness.					
21.	Our employees are able to apply new knowledge for doing their practical tasks					
22.	Our management provides employees with enough cope for development to use the aggregated information for experimenting with alternative solution possibilities					
23.	Our bank regularly reconsiders technologies and adapts them in accordance with the new knowledge.					
24.	Our bank launches innovative services promptly to improve the research and development “RandD” results					
B.	Realized Absorptive Capacity					
25.	Our management encourages employees to generate knowledge					
26.	Our bank strives to use innovative ideas to get patents.					

27.	Our management encourages employees to merge the ideas provided by several departments					
28.	Our employees successfully link the existent knowledge with new insights					
29.	Our employees are used to absorbing new knowledge as well as to preparing it for meeting specific goals and making the knowledge available.					

Competitive performance:						
No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
A.	New Product Development Program (NPD)					
30.	Our new services development program has met our bank objectives					
31.	The bank has a competitive program to develop banking services					
B.	Market Performance					
32.	The bank makes customers satisfied					
33.	The bank meets the customer needs					
34.	The bank retains valued customers					
C.	Financial Performance					
35.	We offer services of better quality.					

36.	The bank reaches he intended business profitability					
37.	The bank reaches the intended return on investment (ROI)					
38.	The bank reaches the intended return on sales (ROS)					

Thanks for answering all the items in the Questionnaire.

Arabic Version

بسم الله الرحمن الرحيم
جامعة الزيتونة الأردنية
كلية الأعمال / قسم إدارة الأعمال

سعادة مدراء ورؤساء الأقسام الكرام،،

السلام عليكم ورحمة الله وبركاته،،

يقوم الباحث بإعداد دراسة علمية بعنوان " أثر القدرات الديناميكية للبيانات الضخمة والتمثل المعرفي على الأداء التنافسي: دراسة تطبيقية في القطاع المصرفي الأردني " وذلك كجزء من متطلبات الحصول على درجة الماجستير في إدارة الأعمال في جامعة الزيتونة الأردنية.

يرجى التكرم بقراءة جميع فقرات الاستبيان والتأشير على الإجابة المناسبة بموضوعية، حيث أن تعاونكم واهتمامكم بالإجابة يحقق نتائج دقيقة ومفيدة لتحقيق أهداف الدراسة. علماً بأنه سيتم التعامل مع جميع المعلومات والبيانات الواردة بسرية تامة وسوف يقتصر استخدامها لغايات البحث العلمي فقط.

شاكراً لكم تعاونكم وتفضلوا بقبول الاحترام و التقدير

الطالب: رامي احمد عيسى

1. الخصائص الديموغرافية:

الرجاء وضع اشارة (√) ازاء الاجابة المناسبة

المتغير	الفئة	الخيار
الجنس	ذكر	
	انثى	
العمر	أقل من 25 سنة	
	من 25 إلى أقل من 35 سنة	
	من 35 إلى أقل من 45 سنة	
	فوق الـ 45 سنة	
المستوى الاداري	مدير عام	
	نائب مدير عام	
	مدير تنفيذي	
	مدير فرع	
	رئيس قسم	
	وظيفة اشرافية اخرى	
المستوى التعليمي	دكتوراه	
	ماجستير	
	بكالوريوس	
	دبلوم عالي	
الخبرة	أقل من 5 سنوات	
	من 5 – 10 سنوات	
	أكثر من 10 سنوات	

2. التعريفات

البيانات الضخمة	الاحجام الضخمة للبيانات التي تتنوع في طبيعتها سواءً ملفات او فديوهات او وثائق او اي نمط من انماط البيانات المتداولة
القدرات الديناميكية للبيانات الضخمة	القدرة على دمج وبناء وإعادة تكوين ومعالجة وتحليل البيانات الضخمة بالشكل المناسب والوقت المناسب.
القدرة الاستيعابية للمعرفة	قدرة (المصرف) على تحديد المعرفة الملائمة له وما يتفرع منها من طرق ادارية او تكنولوجية يتم حيازتها وتحويلها الى ممارسات ملموسة قدرة (المصرف) على التعرف على قيمة المعلومات الجديدة واستيعابها وتطبيقها على الأغراض التجارية
القدرة الإستيعابية الكامنة للمعرفة	إجراءات (المصرف) وعملياته التي تسمح له بتحليل ومعالجة وتفسير وفهم المعلومات التي يتم الحصول عليها من مصادر خارجية بحيث تجعل المصرف قادراً على اكتساب واستيعاب المعرفة الجديدة
القدرة الإستيعابية المحققة للمعرفة	قدرة المصرف على تطوير وصقل الإجراءات الروتينية التي تسهل الجمع بين المعرفة الحالية والمعرفة المكتسبة وقدرته على توظيف هذه المعرفة وتطبيقها لتحقيق الاهداف المنشودة

3. عبارات الاستبيان

الرجاء وضع اشارة (√) ازاء الاجابة المناسبة

أولاً: القدرات الديناميكية للبيانات الضخمة

الرقم	المجال	موافق بشدة	موافق	محايد	غير موافق	غير موافق بشدة
القدرات الديناميكية للبيانات الضخمة						
.1	تغطي القدرات الديناميكية للبيانات الضخمة جميع مجالات العمل في المصرف بما في ذلك طرق جديدة للعمل والتواصل والتعاون					
.2	يساعد تحليل البيانات الضخمة في المصرف على تصميم وتقديم خدمات مصرفية مبتكرة					
.3	يتم توظيف قدرات البيانات الضخمة في ابتكارات جديدة					
.4	يوظف المصرف قدرات البيانات الضخمة في فهم احتياجات العملاء وتلبيتها وبناء رؤية جديدة					
.5	تدعم البيانات الضخمة اساليب الاستدلال والتنبوء في العمل المصرفي					
إدارة البيانات الضخمة						
.6	يمتلك المصرف قدرة إدارية ممتازة في مجال تحليل البيانات الضخمة					
.7	إن المصرف يعطي الكثير من الاهتمام لاساليب إدارة البيانات الضخمة					
.8	إن إدارة البيانات الضخمة تتطلب وجود إدارة عليا تولي الإهتمام بتكنولوجيا البيانات الضخمة					
.9	يمتلك المصرف كادر فني مؤهل لاستخدام تكنولوجيا البيانات الضخمة					

.10	لدى المصرف رؤية استراتيجية واضحة في ادارة البيانات الضخمة					
القدرات التكنولوجية						
.11	يمتلك المصرف قدرات تكنولوجية حديثة في تحليل البيانات الضخمة					
.12	تهتم إدارة المصرف باقتناء أحدث التقنيات ذات الصلة بإدارة وتحليل البيانات الضخمة					
.13	تعمل إدارة المصرف على تخصيص نسبة من الموازنة السنوية لدعم عملية الحصول على أحدث التقنيات الإلكترونية					
.14	تطبيق تكنولوجيا البيانات الضخمة ذات الجودة العالية ضرورة يتطلبها العمل اليومي في المصرف والرقابة على المعلومات المالية للعملاء					
.15	يعمل المصرف على تحديث قدراته التكنولوجية بشكل دوري من خلال الاستثمار باحدث تقنيات ادارة وتحليل البيانات الضخمة					
رأس المال البشري						
.16	يتميز المصرف بامتلاكه رأس مال بشري كفوء وفعال					
.17	يمتلك المصرف رأس مال بشري ذو خبرة تقنية في مجال تحليل البيانات الضخمة					
.18	يمتلك المصرف رأس مال بشري متخصص في التعامل مع البيانات الضخمة وتحليلها					
.19	يقوم المصرف بتدريب رأس المال البشري في مجال تطبيق تكنولوجيا البيانات الضخمة					

ثانياً: القدرة الاستيعابية للمعرفة

الرقم	المجال	موافق بشدة	موافق	محايد	غير موافق	غير موافق بشدة
القدرة الإستيعابية الكامنة للمعرفة المصرفية						
.20	يمتلك المصرف الادوات الضرورية لتطوير المعرفة وتحسين المستوى التنافسي					
.21	لدى المصرف رأس مال بشري لديه القدرة على تطبيق المعرفة الجديدة في مهامهم العملية					
.22	توفر ادارة المصرف كل ما هو مطلوب للتطور والتعامل مع الحلول الممكنة البديلة					
.23	يقوم المصرف وبصورة منتظمة بتحديث التقنيات المستخدمة في العمل المصرفي وفقاً للمعرفة والتكنولوجيا الجديدة					
.24	يعمل المصرف على ابتكار خدمات مصرفية بصورة سريعة وبدون تأخير بناءاً على نتائج البحث والتطوير					
القدرة الإستيعابية المحققة للمعرفة المصرفية						
.25	تعمل ادارة المصرف على تشجيع وتحفيز رأس المال البشري على بناء وتطبيق المعارف والمهارات الجديدة					
.26	يعمل المصرف جاهداً من أجل توظيف الأفكار الابداعية للحصول على براءة إختراع					
.27	تعمل إدارة المصرف على تشجيع رأس المال البشري على تقديم افكار جديدة تفيد عملهم في اقسام المصرف المختلفة					
.28	يعمل رأس المال البشري في المصرف على ربط المعارف والمهارات الحالية بالتوجيهات الجديدة في العمل وبالاخص تطبيق التقنيات الحديثة					

.29	اعتماد رأس المال البشري في المصرف على استقطاب المعرفة الجديدة والتقنيات الجديدة لتطوير عملهم وتحقيق اهدافهم					

ثالثاً: الأداء التنافسي

الرقم	المجال	موافق بشدة	موافق	محايد	غير موافق	غير موافق بشدة
	برنامج تطوير الخدمات المصرفية الجديدة					
.30	يعمل برنامج تطوير الخدمات المصرفية الجديدة على تحقيق اهداف المصرف					
.31	لدى المصرف برنامجاً منافساً لتطوير خدماته المصرفية					
	أداء السوق					
.32	يعمل المصرف على جعل العملاء يشعرون بالرضا					
.33	يعمل المصرف على تلبية إحتياجات العملاء					
.34	يحتفظ المصرف بالعملاء القيمين					
	الأداء المالي					
.35	يحقق المصرف الربحية التجارية الإجمالية المنشودة					
.36	يحقق المصرف الأهداف المالية المنشودة					
.37	يحقق المصرف عائد الإستثمار المنشود					
.38	يحقق المصرف عائد المبيعات المنشود					

Appendix (B): Statistical Results

Construct Reliability and Validity

Matrix | Cronbach's Alpha | rho_A | Composite Reliability | Average Variance Extracted (AVE) | Copy to Clipboard: Excel Format | R Format

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
BDA management	0.757	0.765	0.860	0.672
BDA technology capabilities	0.764	0.767	0.849	0.584
Big data analytics dynamic capabilities	0.783	0.791	0.860	0.606
potential absorptive capacity	0.789	0.792	0.864	0.613
Competitive performance	0.815	0.819	0.866	0.519
BDA Human capital	0.819	0.828	0.881	0.651
Realized absorptive capacity	0.839	0.843	0.886	0.609

Discriminant Validity

Fornell-Larcker Criterion | Cross Loadings | Heterotrait-Monotrait Ratio (HTMT) | Heterotrait-Monotrait Ratio (HTMT)

	BDA Human capital	BDA mana...	BDA techno...	Big data an...	Competitiv...	Realized ab...	potential a...
BDA Huma...	0.807						
BDA manag...	0.588	0.820					
BDA techno...	0.565	0.629	0.764				
Big data an...	0.349	0.436	0.388	0.778			
Competitive...	0.465	0.443	0.426	0.393	0.720		
Realized ab...	0.687	0.622	0.656	0.447	0.585	0.781	
potential ab...	0.649	0.632	0.576	0.445	0.515	0.697	0.783

Discriminant Validity

Fornell-Larcker Criterion | Cross Loadings | Heterotrait-Monotrait Ratio (HTMT) | Heterotrait-Monotrait Ratic

	BDA Huma...	BDA mana...	BDA techno...	Big data an...	Competitiv...	Realized ab...	potential a...
BDA Huma...							
BDA manag...	0.749						
BDA techno...	0.724	0.831					
Big data an...	0.426	0.557	0.496				
Competitive...	0.566	0.560	0.527	0.485			
Realized ab...	0.829	0.780	0.825	0.549	0.699		
potential ab...	0.810	0.811	0.755	0.556	0.637	0.854	

Collinearity Statistics (VIF)

Outer VIF Values | Inner VIF Values

	BDA Huma...	BDA mana...	BDA techno...	Big data an...	Competitiv...	Realized ab...	potential a...
BDA Huma...							
BDA manag...							
BDA techno...							
Big data an...	1.000	1.000	1.000		1.306	1.247	1.000
Competitive...							
Realized ab...					2.035		
potential ab...					2.030	1.247	

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
BDAM	360	1.00	5.00	3.8444	.63811
BDATC	360	2.00	5.00	3.9556	.59662
HC	360	1.00	5.00	3.8493	.64884
BDDC	360	2.00	5.00	4.1139	.54166
RAC	360	1.00	5.00	3.8933	.59070
PAC	360	1.50	5.00	3.8687	.59416
CP	360	2.17	5.00	4.0713	.51488
Valid N (listwise)	360				

الجنس

	Frequency	Percent	Valid Percent	Cumulative Percent

Valid	1	204	56.7	56.7	56.7
	2	156	43.3	43.3	100.0
	Total	360	100.0	100.0	

العمر

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	15	4.2	4.2	4.2
	2	142	39.4	39.4	43.6
	3	135	37.5	37.5	81.1
	4	68	18.9	18.9	100.0
	Total	360	100.0	100.0	

المستوى التعليمي

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	233	64.7	64.7	64.7
	2	78	21.7	21.7	86.4
	3	40	11.1	11.1	97.5
	4	9	2.5	2.5	100.0
	Total	360	100.0	100.0	

المستوى الاداري

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	8	2.2	2.2	2.2
	2	16	4.4	4.4	6.7
	3	59	16.4	16.4	23.1
	4	62	17.2	17.2	40.3
	5	85	23.6	23.6	63.9
	6	130	36.1	36.1	100.0
	Total	360	100.0	100.0	

الخبرة

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	31	8.6	8.6	8.6
	2	116	32.2	32.2	40.8
	3	213	59.2	59.2	100.0
	Total	360	100.0	100.0	

	BDA Human capital	BDA management	BDA technology capa	Big data analytics d	Competitive performan	Realized a	potential absorptive capacity
BDDC2				0.715			
BDDC3				0.824			
BDDC4				0.812			
BDDC5				0.758			
BDM2		0.782					
BDM4		0.831					
BDM5		0.845					
FP1					0.707		
FP2					0.721		
FP3					0.707		
HC1	0.737						
HC2	0.868						
HC3	0.846						
HC4	0.769						
MP1					0.763		
MP2					0.707		
MP3					0.715		
PAC1							0.74
PAC3							0.781
PAC4							0.833
PAC5							0.776
RAC1						0.732	
RAC2						0.78	
RAC3						0.849	
RAC4						0.74	
RAC5						0.796	
TC2			0.771				
TC3			0.764				
TC4			0.77				
TC5			0.752				

جمعية البنوك في الأردن
ASSOCIATION OF BANKS IN JORDAN

الرقم: 7/٣٤٤
التاريخ: 2021/7/4

معالي / سعادة المدير العام / الرئيس التنفيذي المحترم
البنوك الأعضاء / الإدارة العامة

الموضوع: تسهيل مهمة طالب ماجستير.

تحية طيبة وبعد،

إشارة إلى كتاب جامعة الزيتونة الأردنية المرفق طيه والمتعلق بطلب تسهيل طالب الماجستير رامي احمد عيسى وذلك للحصول على البيانات اللازمة وجمع المعلومات بأطروحته للحصول على درجة الماجستير في إدارة الأعمال "أثر القدرات الديناميكية للبيانات الضخمة".

نرجو حضرتكم التكرم بالإيعاز لمن يلزم من الدوائر المعنية في بنككم الموقر لتعبئة الاستبيان الخاص بالدراسة والمبين على الرابط ادناه.

https://forms.gle/jRWUeUK7gQYZtaRj6

شاكرين لكم حسن تعاونكم.

وتفضلوا بقبول فائق الاحترام والتقدير،

د. ماهر المحروق
المدير العام

ب ع

62 Musa Ibn Nosair Street - Amman P.O. Box: 926174 Amman 11190 Jordan
٦٢ شارع موسى بن نصير - وادي صقرة - عمان ص.ب ٩٢٦١٧٤ عمان ١١١٩٠ الأردن
+962 6 5008686 +962 6 5687011 info@abj.org.jo www.abj.org.jo

Appendix C: List of previous studies

No.	Authors	Title	Context	sample	variables				Result	Reference
					IV	MED	MOD	DV		
1.	Merendino A, Dibb S, Meadows M, Quinn L, Wilson D, Simkin L, Canhoto A (2018)	Big data, big decisions: the impact of big data on board level decision-making	**USA**	directors involved in high-level strategic decision-making were interviewed	Big data			**board level decision-making**	**Big data affect the decision-making process that's carried out by the board of directors in companies**	Merendino A, Dibb S, Meadows M, Quinn L, Wilson D, Simkin L, Canhoto A (2018) Big data, big decisions: the impact of big data on board level decision-making. J Bus Res 93:67–78
2.	AL-Jaafreh, Amani ., andFayoumi, Amjad	The Role of Big Data Analytics in Innovation: A Study from The Telecom Industry	Jordan	3 telecom companies in Jordan	Big data and its analysis			innovation	-Big data along with its analysis contribute to supporting the effort exerted by the companies in setting more systematic procedures and guidelines for utilizing various types of big data and showing innovation. -Big data contribute to raising the extent of showing innovation in the telecom companies.	AL-Jaafreh, Amani ., andFayoumi, Amjad. (2017) The Role of Big Data Analytics in Innovation: A Study from The Telecom Industry. Australasian Conference on Information Systems, Hobart, Australia.

3.	Al-Mahamid, Saud	The Impact of Knowledge Management Operations Practice on Performance with the Existence of Organizational Intelligence: A Field Study in the Main Centers of Jordanian Commercial Banks in Amman	Jordan	The sample involves100 managers and head of departments who were selected from 13 banks.	knowledge management practice	Organizational agility		Performance	- Knowledge management practices have a significant statistical impact on performance. - Knowledge management practices have a significant statistical impact on dimensions of organizational agility (sensing and responding capability). - Organizational agility has a significant impact on performance. - Organizational agility has a mediating impact on the relationship between KM practices and performance.	Al-Mahamid, Saud (2015) The Impact of Knowledge Management Operations Practice on Performance with the Existence of Organizational Intelligence: A Field Study in the Main Centers of Jordanian Commercial Banks in Amman. The Jordanian Journal of Business Administration, Volume 11, Issue 2.
4.	Al-Muzayen, Ahmad	Big Data and Knowledge Integration in National Libraries: The Kuwait National Library as a Model.	Kuwait	-	Big data			Knowledge integration	- Big data contributes to improving the decision making process, Knowledge integration and service performance. -The degree to which big data is available in the Kuwait National Library is low -Legislations hinder the management of big data effectively	Al-Muzayen, Ahmad (2019) Big Data and Knowledge Integration in National Libraries: The Kuwait National Library as a Model. Scientific Journal of Libraries, Documents and Information; Volume 1 Issue 2.

5.	Amirhm, Jehan	The Impact of Big Data Analysis on Financial and Operational Performance in Business Organizations (An Empirical Study)	Egypt	40 financial analysts, 60 IT managers and 160 managers in the financial administration department	Big data analysis			Financial and Operational Performance in Business	- Big data analysis contributes to improving financial and operational performance in business organizations in Egypt. -BDA capability (in terms of data access, sourcing, delivery and integration, analytical capabilities, and people's expertise) facilitate the utilization of BDA in making manufacturing decisions. -Organizational readiness and design factors (like: financial resources, top management support, employee engagement and BDA strategy) facilitate the utilization of BDA in making manufacturing decisions. - BDA capability, design factors, and organizational readiness contribution to raising performance. - BDA contributes to empowering employees.	Amirhm, Jehan (2020) The Impact of Big Data Analysis on Financial and Operational Performance in Business Organizations (An Empirical Study), Journal of Financial and Business Research, Volume 21, Second Issue

									- BDA improves transforming operations and production management	
6.	Bahaa J Elsirr	Big Data Management in Gaza Strip Hospitals: Challenges and Opportunity.	USA		Top management support /Organizational culture/ Technological skills of employees /Security effectiveness /cost reduction	-	-	The use of technologies for big data management	Organizational culture, top management support, technological skills of employees, cost reduction and security effectiveness affect the use of technologies in managing big data	Bahaa J Elsirr (2018) Big Data Management in Gaza Strip Hospitals: Challenges and Opportunity. The Central Library - The Islamic University - Gaza.

7.	Camisón, C., andForés, B.	Knowledge absorptive capacity: New insights for its conceptualization and measurement.	Spain	952 Spanish firms	Absorptive capacity	-	-	organizational performance	Absorptive capacity contributes to raising organizational performance	Camisón, C., andForés, B. (2010). Knowledge absorptive capacity: New insights for its conceptualization and measurement. Journal of Business Research, 63(7), 707–715.
8.	Ghasemaghaei, M. and Calic, G. (2020).	Assessing the impact of big data on firm innovation performance: Big data is not always better data	Canada	239 managers	big data's main characteristics (i.e., volume, variety, and velocity)			firm innovation performance	-Data variety and velocity have a positive effect on the firm innovation performance - Data volume doesn't have any significant impact on firm innovation performance. -Data velocity plays a major role in raising the firm innovation performance level	Ghasemaghaei, M. and Calic, G. (2020). Assessing the impact of big data on firm innovation performance: Big data is not always better data. Journal of Business Research. Vol. 108, Pages 147-162,

9.	Erevelles, Sunil., Fukawa, Nobuyuki., Swayne Linda.	Big Data consumer analytics and the transformation of marketing.	USA		Big data			Marketing activities	Big data have a major impact on marketing activities	Erevelles, Sunil., Fukawa, Nobuyuki., Swayne Linda. (2016) Big Data consumer analytics and the transformation of marketing. Journal of Business Research 69 (2016) 897–904
10.	Flatten, Tessa C., Engelen, Andreas., Zahra, Shaker A., Brettel, Malte	A measure of absorptive capacity: Scale development and validation.	USA	German companies	absorptive capacity (ACAP)	-	-	firm performance, knowledge sharing, innovation, organizational learning, and capability building,	-Absorptive capacity (ACAP) significantly affect firm performance, knowledge sharing, innovation, organizational learning, and capability building,	Flatten, Tessa C., Engelen, Andreas., Zahra, Shaker A., Brettel, Malte. (2011) A measure of absorptive capacity: Scale development and validation. European Management Journal, Vol. 29, 98–116.

11.	Hashem, I., Chang, V., Anuar, N., Adewole, K., Yaqoob, I., Gani, A., . . . Chiroma, H.	The role of big data in smart city	Germany	-data was obtained from studies targeting Germany	Big data	-	-	Smart cities	Big data plays a major role in developing smart cities. This article developed a future business model of big data for smart cities	• Hashem, I., Chang, V., Anuar, N., Adewole, K., Yaqoob, I., Gani, A., and Chiroma, H. (2016). The Role of Big Data in Smart City. International Journal of Information Management 36(5)
12.	Hassanein, Badria	Internet of Things and Big Data: Revolution in Education	USA	-	-	-	-	-	Internet of things and big data contributes to improving higher education	Hassanein, Badria (2020) Internet of Things and Big Data: Revolution in Education. Int. J. Learn. Man. Sys. 8, No. 1, 23-43.

13.	Hilbert Martin	Big Data for Development: A Review of Promises and Challenges. Development Policy Review		180 articles related to the opportunities and threats of Big Data	-	-	-	-	-Big Data delivers a cost-effective method for improving the decision-making process in various sectors, including: the economic and healthcare sector. - Big data contributes to fostering opportunities and minimizing risks	Hilbert Martin, (2015) Big Data for Development: A Review of Promises and Challenges. Development Policy Review. Martinhilbert.net. Retrieved 7 October .
14.	Hsieh, M. H., and Tsai, K. H.	Technological capability, social capital and the launch for innovative products.	Taiwan	90 companies in Taiwan	technological capability and social capital,	market characteristics.		the sucess of a launch strategy for innovative products.	-Technological capability and social capital have a significant positive relationship with the success of the launch strategy for innovative products. -There is a positive relationship between technological capability and the launch strategy for innovative products -While the market growth rates increase, the positive relationship between technological capability and the launch strategy for innovative products becomes weaker..	Hsieh, M. H., and Tsai, K. H. (2007). Technological capability, social capital and the launch for innovative products. Industrial Marketing Management, 36(4), 493–502.

15.	Hsu, Ya-H., and Fang, W.	Intellectual capital and new development performance: the mediating role of organizational learning capability	Taiwan	Taiwanese IC design companies	**Intellectual capital**	**Organizational learning capability**		new product development performance	- Intellectual capital have a positive impact on new product development performance. -Human capital and relational capital have a positive impact on the new product development performance - Organizational learning capability have a mediating impact on the relationship between Human capital and relational capital from one hand and new product development performance from another hand. -Structural capital	Hsu, Ya-H., and Fang, W. (2009). Intellectual capital and new development performance: the mediating role of organizational learning capability. Technological Forecasting and Social Change, 76.

									positively affects organizational learning capability. However, managers should pay attention to possibly negative effects of structural capital on new product development performance. -The relational capital of Taiwan's SMEs is marginally less than that of large enterprises.	
16.	Jeong, W., Chung, J. andRoh. J.	Impact of external knowledge inflow on product and process innovation of Korean SMEs: Absorptive capacity as a mediator.	Korea	**Korean SMEs**	**External Knowledge Inflow**	**Absorptive Capacity**		**Product and Process Innovation of Korean SMEs**	Conducting a path analysis, the researchers found that knowledge inflow from customers and government agencies had a positive effect on AC, subsequently enhancing product and process innovation. Additionally, knowledge inflow from universities and government agencies also affected process innovation and product innovation, respectively. The researchers also demonstrated the mediating role of AC in the	Jeong, W., Chung, J. andRoh. J. (2019). Impact of External Knowledge Inflow on Product and Process Innovation of Korean SMEs: Absorptive Capacity as a Mediator. Clothing and Textiles Research Journal. 37 (4), p. 219 - 234

									relationship between external knowledge inflow and innovation. Korean SMEs should thus invest in developing the knowledge sources of customers, universities, and government agencies to enhance AC and innovation.	
17.	Lane, O. J., andLubatkin, M.	1.Relative absorptive capacity and interorganizational learning	USA	pharmaceutical - biotechnology RED alliances.	**Relative absorptive capacity**	-	-	**interorganizational learning**	The similarity of the partners' basic knowledge, lower management formalization, research centralization, compensation practices, and research communities were positively related to interorganizational learning. The relative absorptive capacity measures are also shown to have greater explanatory power than the established measure of absorptive capacity, RandD spending. (C)	Lane, O. J., andLubatkin, M. (1998). Relative absorptive capacity and interorganizational learning. Strategic Management Journal 19(5):461-477

									1998 John Wiley and Sons, Ltd. **-Relative absorptive capacity affects interorganizational learning**	
18.	Lau, Antonio K., and Lo William.	Regional innovation system, absorptive capacity and innovation performance: An empirical study.		-	regional innovation systems (RISs) and absorptive capacity (AC)			innovation performance	-Regional innovation initiatives (RII), knowledge-intensive business services (KIBS) and value chain information sources affect a firm's absorptive capacity, leading to better innovation performance. Specifically, KIBS improves the acquisition process, value chain information sources improve the acquisition and assimilation processes, and RII improve the transformation process.	Lau, Antonio and Lo, William. (2015). Regional innovation system, absorptive capacity and innovation performance: An empirical study. Technological Forecasting and Social Change. 92. 10.1016/j.techfore.2014.11.005.

19.	Tzokasa, Nikolaos., Kimb, Young Ah.. Akbarc, Hammad., Al-DajanidHaya	Absorptive capacity and performance: The role of customer relationship and technological capabilities in high-tech SMEs.	South Korea	316 respondents were surveyed	Absorptive capacity (ACAP)			Performance of high-tech SMEs	- Absorptive capacity affects the performance of high-tech SMEs	Tzokasa, Nikolaos., Kimb, Young Ah.. Akbarc, Hammad., Al-DajanidHaya. (2015) Absorptive capacity and performance: The role of customer relationship and technological capabilities in high-tech SMEs. Industrial Marketing Management 47 (2015) 134–142
20.	Magoulas, Roger., Lorica, Ben	Introduction to Big Data		-	-	-	-	-	This publication sheds a light on -Data acquisition -Data management -Analysis and insight This publication identifies the meaning and significance of big data. For instance, competitive advantage comes from capturing data more quickly, and building systems to respond automatically to that data. MIT researchers were able to predict location and social interactions by analyzing	1. Magoulas, Roger., Lorica, Ben (2009). "Introduction to Big Data". Release 2.0. Sebastopol CA: O'Reilly Media (11).

									patterns in geo/spatial/proximity data collected from students using GPS-enabled cell phones for a semester. As our aggregate behavior is measured and monitored, it becomes feedback that improves the overall intelligence of the system, a phenomenon Tim O'Reilly refers to as harnessing collective intelligence.	
21.	Maqnani, Sabrinah, and Shabila, Moghadam	The Role of Big Data in Supporting Sustainable Development in Arab Countries	Arab Countries	Theoretical study	Big data			Sustainable Development in Arab Countries	-Big data contributes to achieving sustainable Development in Arab Countries - Big data can improve government policies in general and the Arab government policies in particular	. Maqnani, Sabrinah, and Shabila, Moghadam (2019) The Role of Big Data in Supporting Sustainable Development in Arab Countries. Journal of Information Studies and Technology (JIS and T), Volume 2019, Issue 1,

22.	Marfo, John Serbe; Boateng, Richard	Developing big data capabilities in developing countries: Evidence from a cross industry study in Ghana PDF Logo	Ghana	top 2 firms in the banking industry of Ghana, h	bi g dat a			National development	- The big data capabilities are technological capabilities, data management capabilities, legal and ethical capabilities, analytical capabilities, data sharing capabilities and decision making capabilities. Beyond the big data capabilities - Big data benefits include: organizational benefits, managerial benefits, strategic benefits, IT infrastructure benefits and operational benefits.	Marfo, John Serbe; Boateng, Richard (2015) : Developing big data capabilities in developing countries: Evidence from a cross industry study in Ghana, 2015 Regional Conference of the International Telecommunications Society (ITS): "The Intelligent World: Realizing Hopes, Overcoming Challenges" , Los Angeles, USA, 25th-28th October, 2015, International Telecommunications Society (ITS), Calgary

23.	ZhengSuli., Zhang, Wei., Xiaobo Wu and Jian Du	Knowledge-based dynamic capabilities and innovation in networked environments	China	a sample of 218 Chinese manufacturing firms were surveyed.	Knowledge-based dynamic capabilities	Knowledge combination capability		innovation performance.	-Significant relationships were found between dynamic capabilities and innovation performance. Knowledge combination capability played a mediating role in this relationship. For the links between network embeddedness and dynamic capabilities, knowledge acquisition capability was affected mainly by relational embeddedness and the diversity of network and joint problem solving contributed much to knowledge combination capability.	1. ZhengSuli., Zhang, Wei., Xiaobo Wu and Jian Du. (2011) Knowledge-based dynamic capabilities and innovation in networked environments. Journal of Knowledge Management 15(6) DOI:10.1108/13673271111179352

24.	Miaha S., Vu, H., Gammackc, J., McGratha, M.	A Big Data Analytics Method for Tourist Behaviour Analysis.	Australia	Tourists	Big data	-	-	Decision making process	-Big data affects the decision making process -Big data can be used to predict the tourists' behaviours -The researchers designed and evaluated a 'big data analytics' method to support strategic decision-making in tourism destination management	Miaha S., Vu, H., Gammackc, J., McGratha, M. (2017) A Big Data Analytics Method for Tourist Behaviour Analysis. Information and Management 54 (2017) 771–785.
25.	Mikalef, P., Krogstie, J., Pappas, I., Pavlou, P.	Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities.	Norway	202 chief information officers and IT managers working in Norwegian firms. were surveyed	big data analytics capability	dynamic and operational capabilities		competitive performance	Results show that a strong BDAC can help firms build a competitive advantage. This effect is not direct but fully mediated by dynamic capabilities, which exerts a positive and significant effect on two types of operational capabilities: marketing and technological capabilities. The findings suggest that IS researchers should look beyond direct effects of big data investments and shift their attention on how a BDAC can be leveraged to enable and	2. Mikalef, P., Krogstie, J., Pappas, I., Pavlou, P. (2020) Exploring the relationship between big data analytics capability and competitive performance: The mediating roles of dynamic and operational capabilities. Information andManagement Volume

									support organizational capabilities.	57, Issue 2.
26.	Rashwan, Abdel-Rahman	The Role of Big Data Analysis in Rationalizing Financial and Administrative Decision-Making in Palestinian Universities	Palestine	165 f administrative deputies and academics, deans of faculties of economics and administrative sciences, and heads of the financial and administrative departments in the Palestinian universities	Big data analysis			rationalization of financial and administrative decisions in Palestinian universities	The results of the research also showed that it helps to collect, process and store large data in order to obtain accurate information on which to make administrative decisions within the Palestinian universities.	Rashwan, Abdel-Rahman (2018) The Role of Big Data Analysis in Rationalizing Financial and Administrative Decision-Making in Palestinian Universities - A Field Study. Journal of Economic and Financial Studies: Al-Shaheed Hama Lakhdar Al-Wadi University, Volume 11, Issue 11

27.	Richard, O.C.	Racial diversity, business strategy, and firm performance: A resource-based view	USA		racial and cultural diversity and business strategy			the firm performance	-Racial and cultural diversity and business strategy affect the firm performance -Cultural diversity contributes to achieving a competitive advantage	Richard, O.C. (2000). Racial diversity, business strategy, and firm performance: A resource-based view. The Academy of Management Journal, 43(2), 164–177.
28.	Rodriguez L., Da Cunha C.,	Impacts of Big Data Analytics and Absorptive Capacity on Sustainable Supply Chain Innovation: A Conceptual Framework.	-	Theoretical study	**big data analytics and absorptive capacity**	-	-	**sustainable supply chain innovation:**	**Big data analytics and absorptive capacity have an impact on sustainable supply chain innovation:**	Rodriguez L., Da Cunha C., (2018) Impacts of Big Data Analytics and Absorptive Capacity on Sustainable Supply Chain Innovation: A Conceptual Framework. LogForum 14 (2), 151-161,

29.	Rodriguez, A. L., Roldán, J. L., Ariza-Montes, J. A., and Leal-Millán, A.	From potential absorptive capacity to innovation outcomes in project teams: The conditional mediating role of the realized absorptive capacity in a relational learning context.	Spain	**Data was collected from a sample of 110 project managers of firms belonging to the Spanish automotive components manufacturing sector.**	**potential absorptive capacity (PACAP)**	**Realized absorptive capacity (RACAP)**		**innovation performance (IO)**	-There is a significant relationship between potential absorptive capacity (PACAP) and innovation performance (IO) -Realized absorptive capacity (RACAP) has a mediating impact on the relationship between potential absorptive capacity (PACAP) and innovation performance (IO)	Rodriguez, A. L., Roldán, J. L., Ariza-Montes, J. A., and Leal-Millán, A. (2014). From potential absorptive capacity to innovation outcomes in project teams: The conditional mediating role of the realized absorptive capacity in a relational learning context. International Journal of Project Management, 32(6), 894–907.
30.	Yaseen, Saad G. Dajani, Dima., Hasan, Yasmeen.	The impact of intellectual capital on the competitive advantage: Applied study in Jordanian telecommunication companies	**Jordan**	**199 managers, consultants and professionals in the three major Jordanian telecommunication companies (Zain, Orange and Umniah).**	**intellectual capital**			**competitive advantage:**	**Intellectual capital significantly contributes to achieving a competitive advantage in Jordanian telecommunication companies**	3. Yaseen, Saad G. Dajani, Dima., Hasan, Yasmeen. (2016) The impact of intellectual capital on the competitive advantage: Applied study in Jordanian telecommunication companies.

										Computers in Human Behavior 62 (2016) 168e175
31.	Zahra, S	The Interactive Impact of Absorptive Capacity and Developmental Capabilities on Performance Innovation: A Study of Algerian Pharmaceutical Industry Institutions.	Algeria	58 Algerian pharmaceutical firms	the interactive effect of absorptive capacity and development capacity			innovation performance	The interactive effect of absorptive capacity and development capacity significantly affect the innovation performance of Algerian pharmaceutical firms.	Zahra, S (2020) The Interactive Impact of Absorptive Capacity and Developmental Capabilities on Performance Innovation: A Study of Algerian Pharmaceutical Industry Institutions. Review of Economics and Business Administration 3 (1)

32.	Younis, N. (2019).	The impact of big data analysis on improving the quality of accounting information: A field study.	Saudi Arabia	-	big data analysis	-	-	quality of accounting information	Big data analysis contributes to improving the quality of accounting information	Younis, N. (2019). The impact of big data analysis on improving the quality of accounting information: A field study. Al-Feker Al-Muhasabi. 23(2).
33.	Al-Hindawi, M.; and Al-Salnati, L. and Abed Al-Badee', M. (2018)	The absorptive capacity of knowledge as mediating variable affecting the relationship between entrepreneurial orientation and the quality of the electronic banking services: An empirical study targeting the	Egypt	291 employees were surveyed from several commercial banks in the Egyptian Arabic Republic	entrepreneurial orientation	The absorptive capacity of knowledge	-	the quality of the electronic banking services: An empirical study targeting the commercial banks in the Egyptian Arabic Republic.	- Absorptive capacity has a statistically significant impact on the relationship between entrepreneurial orientation and the quality of the electronic banking services: - There is a statistically significant relationship between entrepreneurial orientation and the quality of the electronic banking services	Al-Hindawi, M.; and Al-Salnati, L. and Abed Al-Badee', M. (2018). The absorptive capacity of knowledge as mediating variable affecting the relationship between entrepreneurial orientation and the quality of the electronic banking services: An empirical study targeting the commercial banks in the Egyptian Arabic Republic. Trade and finance journal. No. 2, p. 150 – 187,

		commercial banks in the Egyptian Arabic Republic.								
34.	Khater, S. (2021).	The Moderating Role of Absorptive Capacity in the Relation between Entrepreneurial Marketing and Innovation Performance	Egypt	292 general managers representing electrical industry companies at Egypt	Entrepreneurial Marketing		Absorptive Capacity	Innovation Performance	-Entrepreneurial marketing) and absorptive capacity have a significant positive impact on innovation performance -Absorptive capacity has a mediating impact on the relationship between entrepreneurial marketing and Innovation performance	Khater, S. (2021). The Moderating Role of Absorptive Capacity in the Relation between Entrepreneurial Marketing and Innovation Performance. Commercial and financial research journal. 22(2). https://jsst.journals.ekb.eg/article_142785.html

35.	Ferraris, A., Mazzoleni, A., Devalle, A. and Couturier, J. (2019),	Big data analytics capabilities and knowledge management: impact on firm performance"	Italy	88 Italian SMEs	Big data analytics (BDA)	knowledge management orientation	-	firm performance	-The firms that have more developed (technological and managerial) BDA capabilities than others- have a better performances - KM orientation has a mediating impact on the relationship between Big data analytics (BDA) and firm performances,	Ferraris, A., Mazzoleni, A., Devalle, A. and Couturier, J. (2019), "Big data analytics capabilities and knowledge management: impact on firm performance", *Management Decision* 57 (8), pp. 1923-1936.
36.	Shahbaz, M.; Gao, C.; Zhai, L.; Shahzad, F.; Abbas, A.; and Zahid, R. (2020)	Investigating the Impact of Big Data Analytics on Perceived Sales Performance: The Mediating Role of Customer Relationship Management Capabilities.	China	40 employees	Big data analytics	Customer relationship management capabilities	-	perceived sales performance	-The big data analytics (BDA) and customer relationship management (CRM) capabilities have significant positive impact on the perceived sales performance. -The big data analytics (BDA) creates organizational dynamic capabilities (e.g. CRM capabilities). BDA and CRM capabilities affect the perceived sales performance. -The CRM capabilities have a significant mediating impact on the relationships between BDA	Shahbaz, M.; Gao, C.; Zhai, L.; Shahzad, F.; Abbas, A.; and Zahid, R. (2020). Investigating the Impact of Big Data Analytics on Perceived Sales Performance: The Mediating Role of Customer Relationship Management Capabilities. Complexity. Vol. 2020,

									and perceived sales performance.	
37.	Javdan, M. and Ghasemaghaei, M. (2019).	The Impact of Big Data on Innovation Performance: The Mediating Role of Market-driven Capability"		-	Big data	Market-driven Capability	-	innovation performance	-Big data has a significant impact on innovation performance -Market- driven capability has a significant mediating impact on the relationship between big data and innovation performance	Javdan, M. and Ghasemaghaei, M. (2019). The Impact of Big Data on Innovation Performance: The Mediating Role of Market-driven Capability" (2019). *Proceedings of the 2019 Pre-ICIS SIGDSA Symposium*. 10.

38.	Wamba SF, Gunasekaran A, Akter S, Ren SJF, Dubey R, and Childe SJ (2017	Big data analytics and firm performance: Effects of dynamic capabilities	China	297 Chinese IT managers and business analysts were surveyed	Big data analytics	**dynamic capabilities**	-	firm performance	-The researchers proposed a big data analytics capability (BDAC) model. -Big data analytics capability (BDAC) has a significant impact on the firm performance. -The process-oriented dynamic capabilities (PODC) have a significant mediating effect on the relationship between big data analytics capability (BDAC) and firm performance (FPER).	Wamba SF, Gunasekaran A, Akter S, Ren SJF, Dubey R, and Childe SJ (2017). Big data analytics and firm performance: Effects of dynamic capabilities. J Bus Res 70:356–365
39.	Thirathon, U.; Wieder, B.; Zoltan, Z. and Ossimi, M.	impact of Big Data Analytics on Decision Making and Performance.	Australia	The researchers collected data through a survey from 163 chief information officers and senior IT managers who were working in medium-to-large Australian for-profit organizations.	big data analytics	-	-	Decision making and performance	-Big data and big data analytics (BDA) contribute to improving performance in a direct and indirect manner. -Big data analytics (BDA) improves the decision making process, because managers shall make decisions based on analytics.	Thirathon, U.; Wieder, B.; Zoltan, Z. and Ossimi, M. (2017). Impact of Big Data Analytics on Decision Making and Performance. 14th ICESAL. Thessaloniki, Greece.

40.	Suoniemi, S., Waarden, L. M., Munzel, A., Zablah, A. R., and Straub, D.	**Big data and firm performance: The roles of market-directed capabilities and business strategy**		301 senior marketing managers	**Big data**	**market-directed capabilities and business strategy**		**firm performance**	-Big data significantly affect firm performance. -Market-directed capabilities and business strategy have a significant mediating impact on the relationship between big data and firm performance.	Suoniemi, S., Waarden, L. M., Munzel, A., Zablah, A. R., and Straub, D. (2020). Big data and firm performance : The roles of market-directed capabilities and business strategy. Information and Management , 57(7), 21-28.
41.	Yadegaridehkordi, E., Nilashi, M., Shuib, L., Nasir, M. H. N. B. M., Asadi, S., Samad, S., andAwang, N. F.	The impact of big data on firm performance in hotel industry	Malaysia	Data was collected from top managers and/or owners of SMEs hotels in Malaysia using online survey questionnaire	big data	-	-	firm performance in hotel industry	Big data significantly affects the performance of the firms operating in the hotel industry	. Yadegaridehkordi, E., Nilashi, M., Shuib, L., Nasir, M. H. N. B. M., Asadi, S., Samad, S., andAwang, N. F. (2020). The impact of big data on firm performance in hotel industry. Electronic Commerce Research and Applications , Vol. 40

42.	**Ghasemaghaei, M.**	**Understanding the impact of big data on firm performance: The necessity of conceptually differentiating among big data characteristics**	**USA**	**143 top and middle level managers in the United States.**	**big data**			**Firm performance**	**-Data variety positively affect data value generation** **-Data volume and data velocity do not positively affect data value generation** **-Data volume negatively affects data veracity** **-Data velocity and data variety positively affect data veracity.** **-Big data affects firm performance**	**Ghasemaghaei, M. (2021). Understanding the impact of big data on firm performance: The necessity of conceptually differentiating among big data characteristics, International Journal of Information Management, Vol. 57**
43.	**Bogdan, M. andBorza, A.**	**Big Data Analytics and Organizational Performance: A Meta-Analysis Study.**	**USA**	**Theoretical study**	**big data analytics**	**-**	**-**	**organizational performance**	**-Big data analytics play a major role in raising the level of the organizational performance**	BOGDAN, M. andBorza, A.. (2019). Big Data Analytics and Organizational Performance: A Meta-Analysis Study. Management and economic review, 4(2),. 147-162.,

44.	**Samsudeen, N.**	**IMPACT OF BIG DATA ANALYTICS ON FIRM PERFORMANCE: MEDIATING ROLE OF KNOWLEDGE MANAGEMENT**	**Sri Lanka**	**n 107 SMEs in Sri Lanka**	**Big data analytics (BDA)**		**knowledge management**	**Firm performance**	**-Organizations with technological and managerial BDA capabilities show improved performance mediated by KM.** **-BDA can transform the way in which the businesses compete with each other via improved comprehension, processing and exploitation of copious amounts of data derived from various sources and processes, internally and externally**	Samsudeen, N. (2020). IMPACT OF BIG DATA ANALYTICS ON FIRM PERFORMANCE: MEDIATING ROLE OF KNOWLEDGE MANAGEMENT . *International Journal of Advanced Science and Technology*, *29*(6s), 144 – 157
45.	**Zhang, A. and Lv, N.**	**Research on the Impact of Big Data Capabilities on Government's Smart Service Performance: Empirical Evidence From China**	**China**	**289 employees in public departments**	**Big data capabilities o**			**the government's smart service performance**	**- Big data management capability positively affect big data human capability and big data system capability.** **-Big data system capability positively affect big data human capability.** **- Big data system capability and big data management capability positively affect**	Zhang, A. and Lv, N. (2021). Research on the Impact of Big Data Capabilities on Government's Smart Service Performance: Empirical Evidence From China," *IEEE Access*, vol. 9, pp. 50523-50537

									smart service performance. **- The impact of big data human capability on smart service performance is not however significant enough to bring about the improvements which the government seeks**	
46.	**Raguseo, E. and Vitari, C.**	**Investments in big data analytics and firm performance: an empirical investigation of direct and mediating effects**		**30 companies**	**big data analytics**	**market performance and customer satisfaction**		**firm performance**	**-Regarding the business value achieved from investments in big data analytics, it shall lead to creating an advantages in terms of the financial performance of firms** **-Customer satisfaction has a mediating impact on the relationship between big data analytics and firm performance.** **- market performance doesn't have a mediating impact on the relationship between big data analytics and firm performance.**	Raguseo, E. and Vitari, C. (2017). Investments in big data analytics and firm performance : an empirical investigation of direct and mediating effects. International Journal of Production Research, International Journal of Production Research , 56 (15)

47.	**Grover,V.; Chiang¸R.; Liang, T.; and Zhang, D.**	**Creating Strategic Business Value from Big Data Analytics: A Research Framework.**	**USA**	**Theoretical study**	**Big data and analytics (BDA)**	**-**	**-**	**The creation of a strategic business value**	**-Big data and analytics (BDA) contributes to creating a strategic business value** **- Big data and analytics (BDA) contributes to creating a competitive advantage**	Grover,V.; Chiang¸R.; Liang, T.; and Zhang, D. (2018). Creating Strategic Business Value from Big Data Analytics: A Research Framework. Journal of Management Information Systems, 35 (2). p. 388 – 423
48.	**Pignic, F.; Vitari, C. and Raguseo, E.**	**Profiting from big data analytics: The moderating roles of industry concentration and firm size**	USA	**information on 176 firms was obtained**	**big data analytic (BDA) solutions**	**industry concentration and firm size**		**firm profitability.**	-There is a negative moderating impact for industry concentration size on the relationship between the use of big data analytic (BDA) solutions and firm profitability. - There is a positive moderating impact for firm size on the relationship between the use of big data analytic (BDA) solutions and firm profitability. -There is a significant relationship between big data analytics (BDA) solutions and firm profitability.	Pignic, F.; Vitari, C. and Raguseo, E. (2020). Profiting from big data analytics: The moderating roles of industry concentration and firm size. International Journal of Production Economics. Vol. 229,

49.	**Fernando, Y., Chidambaram, R.R.M. and Wahyuni-TD, I.S.**	**The impact of Big Data analytics and data security practices on service supply chain performance",**	Malaysia	**The data were collected through survey from 145 service firms.**	**the Big Data analytics**			**firm's ability to manage data security, service supply chain innovation capabilities and service supply chain performance.**	It was found that the big data analytics (BDA) has a positive significant impact on firm's ability to manage data security. It was found that the big data analytics (BDA) has a positive significant impact on service supply chain innovation capabilities and service supply chain performance. It was found that most of the sampled companies study used Big Data analytics to execute existing algorithms faster with larger data sets.	Fernando, Y., Chidambaram, R.R.M. and Wahyuni-TD, I.S. (2018), "The impact of Big Data analytics and data security practices on service supply chain performance", *Benchmarking: An International Journal*, Vol. 25 No. 9, pp. 4009-4034.
50.	**Mikalefa, P.; Bourab, M.; Lekakosb, G. and Krogstie, J.**	**Big data analytics and firm performance: Findings from a mixed-method approach**	**Greece**	**175 chief information officers and IT managers working in Greek firms, a**	**Big data analytics**			**firm performance**	**- Big data analytics positively affect firm performance**	Mikalefa, P.; Bourab, M.; Lekakosb,G. and Krogstie, J. (2019). Big data analytics and firm performance : Findings from a mixed-method approach. Journal of Business Research. Issue No. 98

أثر القدرات الديناميكية للبيانات الضخمة والتمثل المعرفي على الاداء التنافسي: دراسة تطبيقية في القطاع المصرفي الأردني

اعداد

رامي أحمد عيسى

المشرف

أ.د. سعد غالب ياسين

جامعة الزيتونة الأردنية، 2021

الملخـص

هدفت الدراسة إلى اختبار الدور الوسيط للقدرة الاستيعابية في العلاقة بين القدرات الديناميكية للبيانات الضخمة والأداء التنافسي في القطاع المصرفي الأردني. استخدمت الدراسة المنهج الكمي التحليلي والاستبانة كأداة دراسة. شمل مجتمع الدراسة جميع البنوك التجارية الأردنية. وتكونت العينة من (360) من مدراء ورؤساء اقسام ومشرفي في اقسام تكنولوجيا المعلومات. أكدت نتائج الدراسة وجود تأثير ذي دلالة إحصائية لقدرات ديناميكية للبيانات الضخمة على الأداء التنافسي في البنوك التجارية الأردنية. كما أشارت نتائج الدراسة إلى وجود تأثير ذي دلالة إحصائية للقدرات الديناميكية للبيانات الضخمة على القدرة الاستيعابية. أشارت نتائج الدراسة إلى وجود تأثير ذي دلالة إحصائية للقدرات الديناميكية للبيانات الضخمة على القدرة الاستيعابية المحققة ، كما أكدت النتائج وجود تأثير ذي دلالة إحصائية للقدرة الاستيعابية المحتملة على القدرة الاستيعابية المحققة. تظهر النتائج أيضًا أن القدرة الاستيعابية المحتملة والقدرة الاستيعابية المحققة تلعب دورًا وسيطًا ودورًا مهمًا إحصائيًا بين القدرات الديناميكية للبيانات الضخمة والأداء التنافسي. وأوصت الدراسة باهتمام مديري البنوك التجارية الأردنية بالبنية التحتية التي تركز على تحسين القدرات الديناميكية للبيانات الضخمة في البنوك لزيادة استخدام بنك دلتا آسيا في هذه البنوك.