جـــامـعـــة الـــشـرق الأوسـط
MIDDLE EAST UNIVERSITY
Amman - Jordan

The Impact of Big Data Analytics Capability on Decision Making Quality: A Case Study on Zain Telecommunication Company in Jordan

أثر قدرة تحليلات البيانات الضخمة على جودة صنع القرار: دراسة حالة شركة زين للاتصالات في الأردن

Prepared by

Samer Sami basal

Supervised by

Prof. Ali Mohammad Al Adaileh

Thesis Submitted in Partial Fulfillment of the Requirements for Master's Degree in Business Administration

Department of Business

Business Faculty

Middle East University

June, 2024

Authorization

I hereby grant Middle East University the authorization and the right to provide copies of my thesis and/or distribute it worldwide, in whole or in part, and/or my abstract, in whole or in part, to Libraries, Institutions and other entities requesting it.

Name: Samer basal

Date: 2/6/2024

Signature: 

Thesis Committee Decision

This thesis is titled **The Impact of Big Data Analytics Capability on Decision Making Quality: A Case Study on Zain Telecommunication Company in Jordan** has been defined, accepted and approved on: 2/6/2024

Examination Committee Members:

Name	Title	Workplace	Signature
Prof. Ali Mohammad Al Adaileh	Supervisor	Middle East University	
Prof. Ahmed Ali Saleh	Internal Member and Chairman	Middle East University	
Prof. Azzam Azmi Abou Moghli	Internal Member	Middle East University	
Prof. Dr. Ahmad Fathi Alheet	External Member	Al-Ahliyya Amman University	

Acknowledgment

First, I would like to thank God. I believe that I could not have finished this work without his help. May he bless all the people who supported me to complete this work.

I am sincerely grateful to my supportive supervisor, **Prof. Ali Mohammad Al Adaileh** , whose recommendations, devotion, advocacy, patience and encouragement have led me to achieve this work.

Finally, I would like to extend my sincere thanks the **examination committee's members** for their kindness to me in accepting to discuss this study and to provide me with useful comments that had a good impact on me Improving the study and raising its scientific level.

Samer Sami Basal

Dedication

Nobody has been more important to me in the dedication of this thesis than my family. I would like to thank my **father** and my **mother**, whose love and guidance are with me in whatever I pursue. Also, I would like to thank my **brother** and **sister** for supporting me during this work. I cannot express my gratitude and thanks by words to my lovely family and friends; so, I extend my deepest appreciation to them.

Samer Sami Basal

List of Contents

Chapter Four :Data Analysis and Hypothesis Testing

Chapter five :Results Discussing

List of Tables

List of figures

List of Appendices

The Impact of Big Data Analytics Capability on Decision Making Quality: A Case Study on Zain Telecommunication Company in Jordan

Prepared by: Samer Sami basal

Supervised by: Prof. Ali Mohammad Al Adaileh

Abstract

This study aimed to identify the impact of big data analytics capability in its dimensions (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making quality in its dimensions (decision making effectiveness - decision making efficiency). To achieve the goal of the study, reliance was placed on the descriptive analytical approach, where a questionnaire was drawn up as a tool for the study and distributed to a simple random sample of employees at various administrative levels and the various departments in Zain Telecommunication Company in Jordan as the study population consisted of 350 individuals, from which a sample of 180 was selected, resulting in 144 responses received. Their answers were analyzed using SPSS and AMOS.

The results of the study showed that there is an impact of big data analytics capability in its dimensions on decision making quality. Also, a moderate level of capability to analyze big data and provide the quality of decision making in Zain Telecommunication Company in Jordan.

The study recommended the need to work on enhancing the application of big data analysis in Zain Telecommunication Company in its various dimensions and using tools to ensure that the level of interest in it does not decline. Holding workshops and brainstorming sessions and offering various training courses and conducting additional studies, leading to efficient capability to analyze big data and quality decision making.

أثر قدرة تحليلات البيانات الضخمة على جودة صنع القرار: دراسة حالة شركة زين للاتصالات في الأردن

اعداد:سامر سامي بصل

اشراف: الاستاذ. الدكتور علي العضايلة

الملخص

هدفت هذه الدراسة إلى التعرف على أثر قدرة تحليلات البيانات الضخمة بأبعادها (الموارد الملموسة، المهارات الفنية، المهارات الإدارية، التعلم التنظيمي والثقافة المبنية على البيانات) على جودة صنع القرار بأبعادها (فعالية صنع القرار – كفاءة صنع القرار). ولتحقيق هدف الدراسة تم الاعتماد على المنهج الوصفي التحليلي، حيث تم إعداد استبانة كأداة للدراسة ووزعت على عينة عشوائية بسيطة من العاملين في مختلف المستويات الإدارية و مختلف الأقسام في شركة زين للاتصالات في الأردن، حيث بلغ حجم مجتمع الدراسة 350 فرداً وتم أخذ عينة 180 منهم حيث تم توزيع الاستبانة عليهم وكان عدد الإجابات المستلمة 144 . وقد تم تحليل إجاباتهم باستخدام برنامج SPSS و AMOS.

أظهرت نتائج الدراسة أن هناك أثر لقدرة تحليلات البيانات الضخمة بإبعادها مجتمعة على جودة صنع القرار، كما أظهرت مستوى متوسط من القدرة على تحليلات البيانات الضخمة وجودة صنع القرار في شركة زين للاتصالات في الأردن.

وأوصت الدراسة بضرورة العمل على تعزيز تطبيق تحليل البيانات الضخمة في شركة زين للاتصالات في الأردن بأبعادها المختلفة واستخدام الأدوات التي تضمن عدم تراجع مستوى الاهتمام بها. وعقد ورش العمل وجلسات العصف الذهني وتقديم التدريبات المتنوعة و إجراء دراسات إضافية، مما يؤدي إلى القدرة الفعالة على تحليل البيانات الضخمة وجودة صنع القرار.

Chapter One:

Background and Importance of the Study

1.1 Introduction

The development of communication and transportation technology has been particularly rapid in this era. As a result of this progression, the needs and wants of customers became more globalized. Nowadays, Consumers are looking for high-quality goods at reasonable prices. As a result, organizations are competing for customers by offering the ideal product in the ideal condition at the ideal location, time, and price.

Since the development of computers, enormous volumes of data have been produced quickly as a result of the technological evolution. Mobile devices, digital sensors, communications, computer, and storage advancements have made it possible to gather data (Tushman and Anderson, 2018). The rapid growth of data has produced various challenges as big data is a significant study subject gaining great attention from academic and IT communities. The exponential expansion of data presents significant challenges for academics and practitioners since it outpaces their existing capacity to keep up with it for humans to create suitable data storage and analysis technologies to efficiently manage massive amounts of data (Yaqoob et al, 2016).

Big data analytics has recently been considered as the next big thing for organizations that are looking to gain a competitive advantage. Predictive analytics is the most effective method for using big data to gain insights into potential future events. The tangible resources (data, technology and other basic resources), human resources (managerial and technical skills) and intangible resources (organizational learning and data driven culture) considered as BDA capabilities building blocks (Jeble et al, 2018).

In order to predict customer behavior and to have better decision-making process using predictive analytics software and retain important customers by making real-time offers, big data analytics capability displays the potential to collect a huge range of data from both present and former customers (Wang et al, 2018).

The value of big data frequently comes from its capability to improve decision-making. The quality of insights depends not only on the data itself but also on how it is gathered and processed. The quality of the decision depends on the quality of both the inputs and the process that converts those inputs into outputs. Additionally, Interactions with decision makers who collect and process data lead to better decisions compared to decisions made without such interactions (Janssen et al, 2017). Top of Form

Big data and advanced analytical methods significantly impact the quality of decision making as Effectively extracting knowledge and valuable insights effectively from big data can enhance strategic decision-making, thereby fostering performance excellence and gaining a competitive advantage (Ayokanmbi, 2021).

Consequently, this study is directed to identify the impact of big data analytics capability on decision making quality. It is applied on a telecommunication company in Jordan that is well-known and leading the market.

1.2 Problem statement

It is needed to be considered that the decision-making process and how to collect and analyze data by the organizations as one of the significant challenges that leads to high-quality decision-making process which gives them the ability to compete effectively and efficiently.

Acharjya and Kauser, (2016) survey reveals that every day, contemporary information systems and digital technologies like the Internet of Things and cloud computing produce a large pool of data that amounts to terabytes. To extract knowledge for decision making, analysis of these enormous data involves significant work on many levels. It is ineffective unless these are examined to obtain relevant information. This calls for the creation of techniques that can be used to enhance big data analysis.

Larrick, (2012) indicates that the strategic decisions that organizations make could result from several processes rather than being only centered on one process. Decision makers should come up with a variety of options, which will expand their search for alternatives. As a result, the study recommended that the decision quality should be given more consideration by the decision makers as a decision making outcome. Moreover, Lansing et al, (2018) consider that they have tried to argue for the necessity of allowing decision makers to take contextual factors into account when assessing the quality of the data. Given their constant access to data, decision makers are required to act more efficiently. It's essential to ensure organizations that the information they receive from other organizations is of a high quality in the context of business-to-business interactions.

According to (Janssen et al, 2017) study, there is a common assumption that analyzing big data leads to improved decision-making, yet it remains unclear which specific factors influence decision-making quality and how they can be enhanced. Also, there are limited studies on the use of big data for decision making, as Many factors influencing decision making process need to be addressed simultaneously to improve its overall quality. Consequently, the literature that is currently available on BDA capabilities has focused little on understanding how data-driven insights might enhance decision making (Awan et al, 2021).

Furthermore, (Chatterjee et al, 2023) study emphasizes that employing Big Data Analytics capability (BDAC) facilitates intelligent decision-making and improves the accuracy of forecasting processes. Also, there is a lack of comprehensive studies in the literature that investigate the combined impact of Big Data Analytics capability on critical aspects such as forecasting, decision-making, and overall firm performance. This gap underscores the necessity for further studies in this area.

Based on the above studies results and their recommendations, there should be more studies in order to examine the relationship of the big data analytics capability and the decision making quality and fill the gap between them. As a result, it is clear that these topics need giving significance to deeper research of evaluating these variables and the relationship among them in the field of telecommunication as it is one of the sectors that include big data from customers and have a high profitability. Since the researcher has been employed by the Zain Jordan Company for seven years, he has gained both field and practical experience in telecommunication companies which lead the researcher to notice the significance of this subject and its necessity for such companies as he recognized that there is no such study in this topic at Zain company which leads to the study purpose to answer the question of what is the impact of big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making quality in Zain telecommunication company in Jordan.

1.3 Study objectives

The study aims to the following objectives:

1- Studying the degree of applying big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture in Zain telecommunication company in Jordan.

2- Studying the degree of providing decision making quality (decision making effectiveness and decision making efficiency) in Zain telecommunication company in Jordan.
3- Identifying the impact of big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making quality (decision making effectiveness and decision making efficiency) in Zain telecommunication company in Jordan.
4- Detecting the impact of big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision-making effectiveness.
5- Detecting the impact of big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making efficiency.

1.4 Study importance

The importance of this study is considering from both scientific and practical points of view as follow:

- **Scientific importance**

This study could be considered as one of the leading studies that examine the impact of big data analytics capability on decision making quality. It also aims to provide valuable understanding guidelines of the BDA capability effect for many kinds of industries and firms, not just for telecommunication field. The content may be interesting for other academic studies related to BDA capability.

It also represents in addition to the accumulation of knowledge about the subject of the BDA capability and its relationship and its impact on decision making quality despite

the several foreign studies in general, there are still shortcomings by researchers at the local and Arab levels as there is no discussion of this topic with the exact dimensions.

- **practical importance**

From the practical aspect, the study sector is Zain telecommunication company in Jordan which is well known company because of the significance of the telecommunication services and the service provider for each individual in the country.

The results of this study can benefit the telecommunication organizations with development work to strengthen the capabilities of how to exploit the existing resources and attract higher quality resources for improving the process of the decision making and increase its effectiveness and efficiency which leads to achieve their goals and gain a competitive advantage.

1.5 Study Questions and Hypothesis

- Study Questions:

This study tries to examine the following questions resulting from the problem statement discussed before:

Q1: what is the level of applying big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture in Zain telecommunication company in Jordan?

Q2: what is the level of providing decision making quality (decision making effectiveness and decision making efficiency) in Zain telecommunication company in Jordan?

Q3: what is the impact of big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture) on

decision making quality (decision making effectiveness and decision making efficiency) in Zain telecommunication company in Jordan?

Q4: what is the impact of big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making effectiveness?

Q5: what is the impact of big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making efficiency?

- Study Hypotheses

In order to determine the relationships among the study variables, the following hypotheses can be proposed:

Main Hypothesis:

H01: There is no impact of big data analytics capability including (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making quality (decision making effectiveness and decision making efficiency) in zain Jordan at ($\alpha \geq 0.05$).

Sub-hypothesis derived from the key hypothesis:

H01.1: There is no impact of big data analytics capability including (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making effectiveness in Zain Jordan ($\alpha \geq 0.05$).

H0 1.2: There is no impact of big data analytics capability including (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making efficiency in Zain Jordan ($\alpha \geq 0.05$).

1.6 Study model

This study seeks to achieve its main objective of verifying the impact of big data analytics capability on decision making quality in Zain telecommunication company in Jordan, as shown in the following study model Figure (1.1). The independent variable is big data analytics capability with its dimensions (tangible resources, technical skills, management skills, organizational learning and data driven culture). The dependent variable is decision making quality with its dimensions (decision making effectiveness and decision making efficiency).

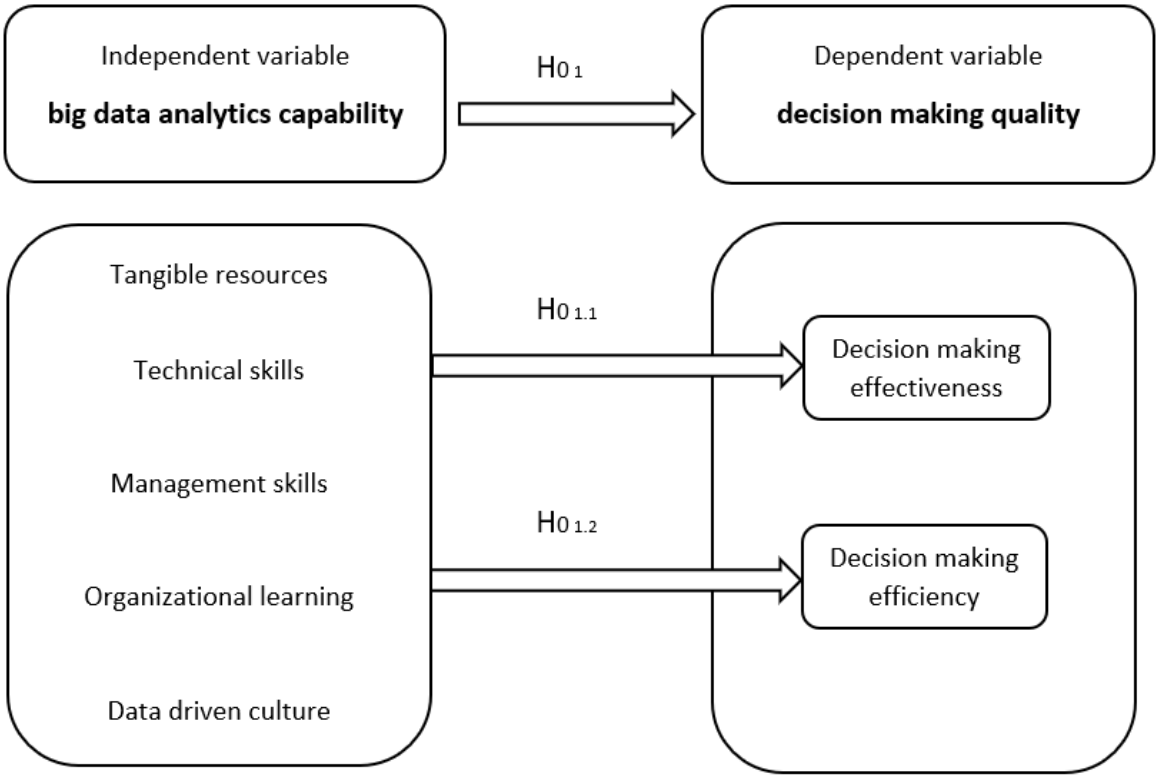

Fig1.1: Study model
Source: for independent variable: (Jeble et al, 2018; Mikalef et al, 2019) for dependent variable: (Shamim et al, 2019).

1.7 Study limitations

- This study applied in Zain telecommunication company in Jordan, and it is different to generalize the results on other fields companies.
- This study applied in the Arab environment; this may be specific to its results in other foreign environments.
- Study results depend on the objectiveness and credibility of the sample members to the extent of their response to the questionnaire.

1.8 Study delimitations

The scope of the study is composed as follows:

- **Spatial**: This study applied on one Jordanian telecommunication company (Zain Jordan) as a case study.
- **Humanity**: The employees who have a managerial role in Zain telecommunication company in Jordan.
- **Temporal**: The Academic year of 2023/2024.
- **Scientific Delimitations**: In this study, the relationship between big data analytics capability (tangible resources, technical skills, management skills, organizational learning and data driven culture) and decision making quality (decision making effectiveness and decision making efficiency), are going to be analyzed, and study the effect of BDA capabilities on decision making quality.

1.9 Conceptual and operational definitions

Independent variable

1. **Big Data Analytics (BDA) Capability** is defined as the ability of the company to gather and analyze data in order to provide insights by effectively utilizing its talent, technology and data through company-wide roles, processes, and structures (Mikalef et al, 2019).

The Operational definition for BDA capability is to gather and analyze big data and execute them for developing the alternatives for a high quality of decision making process by using descriptive analytics for the historical data and use them with the present data to predict future events as predictive analytics.

2. **Tangible Resources:** are defined as the substantial or material resources, which are mainly composed of financial, manufactured, and natural capital (orth et al ,2015).

The Operational definition for tangible resources: are one of the big data analytics capability resources that the company management needs to provide and develop, it includes capital, applied technology and data sources.

3. **Technical skills:** defined as the technical knowledge, competence, or expertise relevant to the workers' industry, whether engineering or technical (Nasir et al ,2011).

The Operational definition for technical skills: are considered as human resources referred to the big data analyst who needs appropriate knowledge, skills, and educational competencies in data analysis to be applied in understanding and solving business problems.

4. **Management skills:** is the definition of how to organize and administrate the business's activities effectively (Kerrin et al, 2017).

The Operational definition for Management skills: it is considered as a human resource related to have managers with strong leadership, evaluating and applying data analytics skills, as well as the ability to form teams with the right skills and direct them towards common goals.

5. **Organizational learning:** is defined as a social-relational cognitive activity when a group of people rather than a single person serves as the main object for learning (Hyypiä, 2022).

The Operational definition for organizational learning: it is one of the intangible resources that refers to the process of continuous learning within the organization and how to realize and develop it in order to be applied effectively.

6. **Data driven culture:** defined as a set of people's behaviors and practices that are consistent with their shared belief that possessing, analyzing, and implementing particular types of data and information that essential for the success of their organizations (Chatterjee et al, 2021).

The Operational definition for data driven culture: is one of the intangible resources that has a crucial role in building the organizational culture of big data applications within the organization in terms of relying on available data to make decisions scientifically.

Dependent variable

1. **Decision making quality:** defined as the contribution a decision makes to achieving organizational goals (wills, 2022).

The Operational definition for decision making quality: is the process of making the decision using available data that has been analyzed with high quality by providing efficient management and leadership and allocating other resources necessary to achieve goals.

2. **Decision making effectiveness:** the degree to which a data-driven decision provides a business to understand customers effectively, make decisions in real-time, and react to change more quickly (Cao and Duan, 2014).

The Operational definition for decision making effectiveness: is one of the characteristics of the decision-making quality that can be achieved by utilizing high-quality and appropriate data and resources to achieve goals and develop organizational and functional performance.

3. **Decision making efficiency:** the quality of using the resources in the decision making process smoothly such as time, cost, etc. Which leads to make a quality decision (Shamim et al, 2019).

The Operational definition for decision making efficiency: is one of the characteristics of decision making quality that can be retrieved through the use of the necessary data and resources to obtain decision making results in a timely manner and at the lowest possible costs.

Chapter Two

Theoretical Framework and Previous Studies

This chapter includes definitions and components of big data analytics capability and decision making quality, relationships between big data analytics capability and decision making quality variables. Moreover, it includes previous studies. Finally, it summarizes what differentiates this study from previous studies.

2.1 Big Data

The huge amount of data that is produced and stored, as well as made available to stakeholders, has become a source of strength for any knowledge-based society. Big data, which is used properly, can contribute significantly to sustainable economic development, and is referred to as the indispensable raw material. It is one of the most important activities of the new century (Monino & Sedkaoui, 2016).

Organizations around the world, regardless of their size and diversity of ownership, have given great importance to investing in big data in recent years. In parallel, the topic of big data has become one of the most important topics in the management environment of business organizations. It is defined as a comprehensive approach to managing, processing, and analyzing dimensions related to data (volume, variety, velocity, validity and Value) to create actionable ideas to capture sustainable value, measure performance, and create competitive advantages. Some researchers have suggested that big data analysis is the fourth paradigm of science, or a new model for knowledge assets, or the new frontiers of innovation, competition, and productivity. Big data analysis has become a basis for data-based decision-making and innovative ways of organizing, learning, and innovating, thus enhancing relationship management. with customers, improve

operational risk management, and enhance operational efficiency and overall performance of the organization (Darvazeh et al., 2020).

Big data analysis has been classified as one of the most important items on the agenda in many companies, as the spread of data and information available at the present time has accelerated significantly compared to the past, and data has become available in different forms and patterns, which makes it important and has a major role in making many decisions and enabling Established by drawing up strategic plans and policies that assist in the decision-making process. On the one hand, on the other hand, data has become available to everyone, and big data analysis techniques have also become available to everyone, making it impossible to obtain performance gains from them (Al-Zubaidi and Al-Zayadi, 2023).

Big Data is a term given to huge amounts of data that exceed the ability of traditional technologies to process and analyze. Big Data is considered one of the most important technological challenges and opportunities in the modern era, as the world produces huge amounts of data daily that come from multiple and diverse sources such as social media. Social media, smart devices, websites, and smart equipment (Gupta & Sharma, 2023).

2.1.1 The concept of big data

Vardarlier & Silahtaroglu (2016) defined it as: "A set of interconnected data collected from various sources such as social media, transaction databases, maps, and log files, having the characteristics of diversity, speed, volume, veracity, value, and quality".

Al-Ghubairi and Hassan (2019) defined it as: "enormous amounts of data that are characterized by complexity and achieve a high level of distribution and speed, the size of which exceeds the capabilities of traditional software and computers to store, process, and distribute them". Al-Zubaidi and Al-Zayadi (2023) believe that big data is: "The

complex and huge collection of data and information that is collected and stored through a large number of electronic platforms available on the Internet and then analyzed through the use of a series of simple and complex technologies".

According to Gopal et al. (2022) stated that the term “big data” usually refers to huge amounts of data that need to be processed with advanced tools and special techniques to benefit from their value and obtain a comprehensive understanding of them.”

In general, increasing in the volume of big data is usually attributed to three factors, which Eid (2021) mentioned as follows:

- Increasing use of technology: The increasing number of devices and the increasing use of digital technology leads to the generation of huge amounts of data on a daily basis.
- Human interaction with the Internet: The increasing number of users of the Internet, social networks, and connected devices leads to the generation of huge amounts of data from texts, images, video clips, audio, and other data.
- Business innovation: Companies and institutions’ use of big data analytics to make decisions and improve performance requires collecting and analyzing large amounts of data.

Through the previous definitions, the researcher believes that the operational definition of big data can be defined as a large and diverse group of organized and unorganized data produced by modern technology, and the increasing use of communication technology, human interaction with the Internet, and business innovation contributed to its increase.

2.1.2 The importance and benefits of big data in business

Al-Bar and Al-Dossari (2019) point out the importance of the results obtained through big data analysis, through the great effectiveness it achieves in many processes, including specifically product marketing processes. It is also considered an opportunity for new income and finding new solutions, as well as Improving efficiency in operational processes and achieving many advantages in order to outperform competitors.

Information technology also uses its tools to analyze and process huge data, with the aim of retrieving that data from a group of different systems in organizations, and then processing it in order to work on developing new products or creating new products, as well as working to reduce production costs, avoid errors, and provide assistance to decision makers. , which ultimately leads to increased competitiveness and the spread of renewal and innovation processes (Bahrami et al., 2022).

Big data helps business organizations better understand customers and the market, make informed strategic decisions, improve operations performance, increase operational efficiency, and achieve prediction of future trends (Monino, & Sedkaoui, 2016). There are many benefits that business organizations gain from dealing with and analyzing big data, and the most important of these benefits are the following (Eid, 2021; Raman et al., 2018):

- **Improving decision making**: Big data enables business organizations to rely on strong evidence and analyzes to make accurate strategic decisions, as comprehensive data analysis contributes to understanding trends and challenges, thus setting priorities and making the right decisions.
- **Improving marketing and customer service**: Big data can be used to analyze customer behavior, needs and preferences, which helps business organizations

improve marketing and customer service strategies and better meet their expectations.

- **Identifying opportunities and improvements**: Big data can analyze patterns and trends and predict new opportunities and improvements in current operations, as this contributes to achieving competitive superiority and developing new products and services.
- **Improving efficiency and productivity**: Big data analysis helps improve internal processes and procedures and improve the operational efficiency of business organizations.
- **Utilizing diverse sources of data**: Big data provides the opportunity to use diverse sources of data, including social media data, text, images, video, sensors, etc., to obtain comprehensive and comprehensive insights.

Al-Aklabi (2018) points out that the importance of analyzing big data is that it provides organizations that use it with a competitive advantage over other organizations, as it enables them to develop practical solutions to get rid of the complexity of this data, as well as work to classify it according to its content to achieve added value for those organizations, as follows:

- Making and making decisions clearly and accurately.
- Identifying unexploited opportunities as well as points that may suffer from shortcomings and weaknesses.
- Enabling stakeholders to develop solutions to expected problems that may be revealed by the analysis process.
- Increasing the ability to anticipate the future for planning workers.

2.1.3 Characteristics of big data

There are many characteristics of big data, such as volume, diversity, reliability, validity, quality, suitability, and rapid processing of data (Hwang & Chen, 2017), and in this study the following characteristics were relied upon:

First – volume:

In big data, volume is one of its main characteristics, and refers to the amount of data that significantly exceeds the conventional capacity of conventional tools and techniques for storage, processing, and analysis. Specifically, volume in this context expresses the amount of data accumulated rapidly and continuously from multiple sources (Gandomi & Haider, 2015).

The volume characteristic in big data refers to the size of the data that is extracted from a source, and this is the basis for determining what the probability value of the data is in order to be identified within the big data. It is the number of terapatites of data collected daily from sources, and it may be the most important characteristic in analyzing big data, and describing it as huge does not specify a specific quantity; Rather, it is usually measured in petabytes or exabytes (Al-Ajmi et al, 2022).

Second - velocity (fast data processing):

Big data arises very quickly and continuously from multiple sources, such as social networks, connected devices, sensors, automated systems, and other devices. For example, smart sensors produce continuous data on temperature, humidity, pressure, and motion on a daily basis (Raman et al., 2018).

What is meant is the speed of production and extraction of this data to meet the necessary demand of users, and thus the speed in obtaining this data is an important and

essential characteristic in making decisions based on this data, which is the time that is spent from the moment this data arrives to the moment of making a decision based on it. Previously, it was Companies used to process a small set of data stored in the form of structured data in databases, a process called (batch process), where each data set was analyzed one after another while waiting for the results to arrive (Hammad, 2021).

Third - variety:

What is meant is the diversity in this resulting data, which contributes to assisting all users and those interested, whether researchers or developers of technologies that rely on a large number of data, or even analysts, to work on choosing the appropriate data for the field of their research, which is the diversity of this data between documentary data, images, clips, and recordings. Audio, videos, SMS, call logs, map data (GPS), etc.; It requires time and effort to prepare it in an appropriate form for processing and analysis (Caracciolo et al, 2022).

Fourth – Value:

It means the extent of the desired benefit from the large data that will be analyzed. It is noteworthy that the more accurate and quality the data is, the greater the value that the organization retains. The period required for the data processing process is also considered very important, as the relationship is inverse between the period for which Processing data and transforming it into useful information and the value of that information (Al-Bar and Al-Dosari, 2019).

2.1.4 Big Data Analytics (BDA) Capability

BDA is defined as the ability of the company to gather and analyze data in order to provide insights by effectively utilizing its talent, technology and data through company-

wide roles, processes, and structures (Mikalef et al, 2019). The big data analytics considers the methodologies of analyzing a large amount of data using advanced statistical techniques such as regression and classification and decision tree analysis (Elgendy and Elragal, 2014).

According to Sheng et al, (2021) study, big data analytics consist of three main methods. The descriptive and diagnostic analytics, predictive analytics and Prescriptive analytics.

Descriptive and diagnostic analytics Descriptive and diagnostic analytics present data in a comprehensible format and explore cause-and-effect relationships. Descriptive analytics summarize historical data to offer an overview of potential patterns or trends inherent in the data while diagnostic analytics involves examining historical data to identify problems and opportunities within existing operations.

- Predictive analytics

Predictive analytics focuses on forecasting future events or behaviors using statistical techniques that analyze current and historical data. It involves making predictions based on data patterns and trends observed in the past and present. Predictive analytics includes empirical methods, both statistical and other, that not only generate data predictions but also include methods for assessing the predictive power of those predictions.

- Prescriptive analytics

Prescriptive analytics, although less commonly discussed compared to descriptive and predictive analytics, extend beyond predictive analytics by recommending actions to optimize future outcomes. Prescriptive solutions involve determining actions and assessing their impact on business objectives, requirements, and constraints. This process supports business analysts in making well-informed decisions.

The predictive analytics is the most useful technique as it is the process of discovering meaningful patterns of data using pattern recognition techniques, statistics, machine learning, data mining and artificial intelligence to get insight in the data about what may happen in the future (Kumar and Garg, 2018). High volume, high speed, and wide variety are characteristics of big data. By assembling strategic resource or capability bundles, organizations gain a competitive advantage. The combination of resources creates capabilities that are necessary for an organization and depend on the operating environment. BDA can help with reducing the costs and improving efficiency, responding more rapidly to change circumstances, give suppliers greater power in supplier relationships, and improve sales and operational planning capabilities. (Gunasekaran et al, 2017). We may conclude that BDA is a developing field that requires a multidisciplinary approach that involves computer science, statistics, mathematics, psychology, and sociology in order to analyze and interpret data. (Dubey et al, 2018).

According to Gupta and George (2016), tangible resources such as data, technology, human resources (technical and managerial skills), and intangible resources (organizational learning and a data driven culture) are the building systems of BDA capabilities.

1- Tangible Resources

defined as the substantial or material resources, which are mainly composed of financial, manufactured, and natural capital (orth et al ,2015). The tangible resources were classified into three categories: computers and databases, physical access, and laboratories and testing facilities.

These three categories interact with the local organizational context in different ways, both individually and collectively, to impact the development of organizational capabilities.

Additionally, tangible resources have an impact on intangible antecedents. For instance, laboratories can increase organizational experience, which is then attributed to the development of capabilities. The decision-makers who have the responsibility of resource orchestration are unlikely to be completely aware of the significance of all the resources involved. (Schriber and Löwstedt, 2015). The tangible resources of the organizations are essential for improving financial performance. It has been observed that tangible resources significantly contribute to improving operational performance, which improves the supply chain and increases profitability. (Wongwilai et al, 2022).

The fact that tangible resources cannot be transferred because they are vital to the organization can result in higher rents when the property is unique physically, even though it is generally accepted that they do not alone give organizations a competitive advantage. Both academics and business are interested in researching how tangible resources affect the development of capabilities that can result in competitive advantages. (Torres-Barreto et al, 2020).

2- Technical skills

defined as the technical knowledge, competence, or expertise relevant to the workers' industry, whether engineering or technical (Nasir et al ,2011). The key element that contributes to the growth of every developed country is qualified labor, especially among industries, in order to sustain and improve healthy competition. Technical education is crucial for developing a technical labor force and human resources that capable of completing technical tasks. Because an organization's quality is determined by its productivity and employees' performance, individual competency and organizational competency are complementary. (Salleh and Sulaiman, 2015).

Therefore, Employees must be given the resources they need to engage in more creative, coordinated, and strategic tasks. The specified competencies are becoming increasingly significant and demand attention from human resource development even though each position has varied requirements. The competency model can be utilized to evaluate and enhance an employee's capabilities to meet future challenges. (Hecklau et al, 2016). Employees can contribute to enhance organizational performance by generating ideas and using them to create new and improved products, services, and working practices. However, the assistance of employees by their leaders is crucial for the development and implementation of creative ideas. leaders play a vital role in enhancing employees' creativity and development of innovation capability (Van Minh et al, 2017).

3- Management skills

is the definition of how to organize and administrate the business's activities effectively (Kerrin et al, 2017). The management's duty is to facilitate group performance through clear objectives, shared values, structuring, training, and development, all of which must be given to performance and adjust to changes. Global Development has resulted in ongoing management changes and the managers of the 21st century must become masters of change. In the spirit of shared values, a new managerial behavior style contributes to the development of a new organizational culture, which is necessary for establishing a shared understanding of the organization's goals. (Nekoranec, 2013).

Human resources may influence employees by assisting with career development and businesses by highlighting the advantages that emerging digital technologies bring. Digital technologies have an impact on the skills needed for various professions and change how much they are now used in workplaces. (Mazurchenko and Maršíková, 2019). The main responsibility of managers is to organize and communicate duties, assign

employees to tasks in accordance with their responsibilities, and create a positive work environment in order to motivate and encourage individuals to achieve organizational goals. Four fundamental forms of skills are required for managers to successfully carry out their duties: Interpersonal, conceptual, analytical, and diagnostic abilities in the workplace (Popescu et al, 2020).

4- Organizational learning

is defined as a social-relational cognitive activity when a group of people rather than a single person serves as the main object for learning (Hyypiä, 2022). The organizational learning capacity of a company is defined as the set of organizational elements or values that affect a company's tendency to create and apply knowledge. The organization's top managers need to understand the value of learning and support it by encouraging the growth of a culture that includes knowledge generation, transfer, and acquisition. (López-Cabrales et al, 2011).

Organizational learning is based on the individual learning of the people who make up the organization, and the human resource system has been illustrated to influence the capability of the organization to generate new knowledge and enhance learning. This considers that human resource management (HRM) plays a central role in a company orientated towards learning (Alshammari, 2020). By taking new knowledge and transforming it into products, strategies, and organizational structures that help an organization to adapt its environment and gain competitive advantages that support its long-term survival, organizational learning helps an organization interact with the challenges of its environment. Group learning processes come after individual learning processes, and the organizational level as a whole represents the return on this learning. (El-ata and Salah, 2023).

5- Data driven culture

defined as a set of people's behaviors and practices that are consistent with their shared belief that possessing, analyzing, and implementing particular types of data and information that essential for the success of their organizations (Chatterjee et al, 2021). An emphasis on testing and experimenting, the weighting of data over opinions, and the acceptance of failure are characteristics of a data driven culture. Organizations that implement a data driven approach have the opportunity to achieve success in their business and surpass rival companies. A data driven culture will assist organizations in gaining a comprehensive understanding of their plans to increase the application of advanced analytics. (Berndtsson et al, 2018). Businesses that make decisions based on evidence are typically 5% more productive and 6% more profitable than their rivals. Building capabilities, tools, and, most importantly, a culture that acts on data is necessary to become data driven. The major barrier to transforming firms to become data driven is thought to be the difficulties of changing organizational culture. Consequently, in order to benefit from the advantages of investments in data and analytics, an organization must first become one that is data driven. (Storm and Borgman, 2020).

2.2 Decision making

Decisions making is one of the fundamental tasks and basic functions of the manager. The amount of success achieved by any organization depends primarily on the ability and efficiency of the administrative leaders and their understanding of administrative decisions and the methods of making them, and the concepts they have that guarantee the rationality and effectiveness of decisions, and realizes the importance of their clarity and timing, and works to follow up and evaluate their implementation. (Al-Saati et al, 2022).

Decision-making is the essence of the process and its primary means of achieving the organization’s goals. It is also characterized by continuity and dynamism in various areas of

management. In addition, the decision-making process contributes fundamentally to enabling the organization to continue its administrative activities efficiently and effectively. Especially since administrative decisions depend on anticipating the future and its variables. Therefore, the decision-making process may be one of the most difficult administrative tasks, because it is a task based on selecting the most appropriate and appropriate options that requires decision makers to distinguish between urgent matters and important matters, as the results must be carefully investigated to ensure the effectiveness of the decisions and the effects resulting from them (Awad, 2021).

2.2.1 The concept of decision making

There are many definitions of the concepts of decision-making, but most of them revolve around choosing an alternative from several alternatives to overcome a situation or solve an existing or expected problem after collecting and analyzing information. Decision-making is defined as: “making a specific judgment about what the individual should do in a situation after examination.” The precise definition of the different alternatives that can be followed, or it is the moment of choosing a specific alternative after evaluating different alternatives according to certain expectations of the decision maker (Bateman & Mace, 2020).

As for the decision-making process, it is: "a successive set of steps and procedures that ultimately lead to choosing the best alternative solutions and issuing orders for their implementation. The decision-making process also means the set of steps that the decision-maker takes in order to reach the goal for which he seeks" (Al Bakhit, 2020).

There are three types of decisions, and they express the circumstances in which various types of decisions are made, and they are as follows:

1- **Decision making in a state of complete certainty**: This is the simplest type of decision facing the decision maker, in which he can determine the results of each of the available alternatives with certainty, and the reason is due to the availability of the necessary data and information according to the nature of the problem, and

once this is done, the task of the decision maker is to This case is choosing the alternative that achieves the greatest possible return in light of this certain situation (Al-Bakhit, 2020).

2- **Decision making in a state of uncertainty (risk)**: This situation is known as the process of decision making under conditions of risk, where the decision maker determines a number of cases or events expected to occur in the future, as well as the probabilities of each of these cases or events occurring (Awad, 2021), and the probabilities of these events occurring are often determined in one of the following two ways (Aishoush, 2018):

A - Objective probabilities: They are calculated on the basis of analysis of historical data available or collected from previous years, and on the basis that what happened in the past may happen in the future.

B - Estimated probabilities: They are determined on the basis of experience and personal estimation or polling the opinions of experts and specialists, and the standards used in both cases are called estimated probabilities, or the standard of what is called the expected value.

3- **Decision making in a state of complete uncertainty**: In a state of complete uncertainty, the decision maker is unsure of the probabilities of multiple events because there are no experiences in the past that could enable the decision maker to estimate these probabilities.

For example, we find production or service establishments operating within economic systems whose decisions are characterized by a state of uncertainty because their markets are unbalanced and turbulent in terms of the relationship of supply and demand, and therefore the data and information available about the results of the decision are insufficient (Aishoush, 2018). In such a case, the decision maker must make a specific decision based on one of the various

criteria that helps decision makers determine the best alternative and make the appropriate decision, and among these criteria are (Fikri and Shadi, 2020):

A- **The maximum maximum criterion**: where the decision maker tests the alternatives that achieve the greatest financial return for him, that is, taking the optimistic alternative.

B- **Maximum minimum criterion**: In this case, the decision maker acts with a kind of pessimism, and chooses the least benefits.

C - **Minimum-maximum criterion**: In this case, the decision maker acts with cautious optimism, that is, by choosing the best results for each alternative and then choosing the least of these results.

D- **Minimum standard**: The decision maker in this case acts with a high degree of pessimism, and this is in a state of great uncertainty for the decision maker, so he chooses the lowest return for each alternative.

E- **Regret criterion**: In this criterion, the decision maker, after making the decision and obtaining a certain return, may feel regret because he knows during that period the state of nature that occurred, and therefore he wishes he had chosen another alternative other than the one that was chosen.

Through the previous definitions, the researcher believes that decision-making refers to the cognitive process resulting from a set of steps aimed at choosing an alternative among many possible alternatives and possibilities, and each decision-making process presents a final choice, which may lead to taking or not taking a specific action, that is, Decision making is the process of identifying and choosing alternatives based on the values, preferences and beliefs of the decision maker to arrive at a final decision to be made.

2.2.2 The importance of making decisions

Decision making is the focus of the administrative process, as we mentioned, because it is an intertwined process in all administration functions and activities. When the administration exercises the planning function, it makes certain decisions at every stage of plan development, whether when setting the goal, drawing policies, preparing programs, or identifying appropriate resources. Or choosing the best ways and methods to operate it, and when the administration establishes the appropriate organization for its various tasks and multiple activities, it makes decisions regarding the organizational structure, its type and size, the basis for dividing departments and divisions, the individuals it needs to carry out the various tasks, the appropriate scope of supervision, and the lines of authority, responsibility, and communication (Othman, 2017).

When a manager assumes his leadership function, he makes a set of decisions, whether when directing his subordinates and coordinating their efforts, consulting their motivations and motivating them to perform well or solving their problems. When management performs the oversight function, it also makes decisions regarding determining the appropriate standards for measuring business results, and the amendments that it will make to the plan. And work to correct errors, if any, and thus the decision-making process takes place in a continuous cycle while the administrative process itself continues (Al-Sarsak, 2020).

Awad (2021) believes that the importance of making administrative decisions is as follows:

- Decision-making is a continuous process as the administrative process itself continues.
- Making decisions is the manager's tool in his work, and activities and actions are only carried out through a series of decisions taken in the field of something, in an interconnected and integrated manner in order to achieve goals with high efficiency.

- Decisions determine the future of the organization and have a significant impact on the organization's success or failure.
- Decision making is the core of the administrative process and all the administrative activities of the organization and the manager revolve around it.
- The administrative decision is considered a legal or regulatory act and a means of administration to achieve its purposes and objectives. It is the one that crystallizes directions and policies into tangible matters and also corrects errors and corrects distortions in the course of that process.

2.2.3 Stages of the decision-making process

There are many stages that the decision-making process goes through, including the stage of defining the problem, the stage of collecting data and information, the stage of identifying alternatives, the stage of choosing the most appropriate alternative, and the stage of implementing and following up on the decision. The following is a review of the dimensions of the decision-making process:

1- Identify the problem:

One of the important things that a manager must realize when he is about to identify the basic problem and its dimensions is to determine the nature of the situation that created the problem, the degree of importance of the problem, not to confuse its symptoms with its causes, and the appropriate time to address its solution and take an effective and appropriate decision regarding it (Alkatheeri, et al., 2020).

This is evident in the conscious awareness of the problem, the necessity of issuing an administrative decision to solve it or deal with it, understanding its size, characteristics, severity, and danger to those affected by it, the reasons that lead to it, and understanding the problem (Al-Bakhit, 2020).

The process of identifying the current and future problem of the organization leads the decision maker, through his activities within the organization, to arrange and classify them to form the general framework of the decision by specifying the alternatives to be considered, and the method of evaluating these problems (Abdullah, 2018).

2- Collecting data and information:

Really understanding the problem and proposing appropriate alternatives to solve it requires collecting data and information relevant to the problem being decided. Effective decision-making depends on the manager's ability to obtain the largest possible amount of accurate data and neutral, timely information from its various sources, and then determine the best possible solution. ways to obtain them, then he carefully analyzes them, compares facts and figures, and emerges from that with indicators and information that help him reach the appropriate decision (Obaid and Al-Sheikhly, 2015).

The process of collecting information is one of the most important matters on which the analysis, decision-making and decision-making process is based. Through collecting data and identifying the problem and its branches, and through deep and careful thinking, the sources of information related to that problem and its dimensions affecting the organization are identified (Abdullah, 2018).

3- Identify and evaluate available alternatives:

Identifying alternatives is the actions that enable the organization to solve problems or achieve expected goals. There are few alternatives that can replace any action, so managers cannot compare them with other clearly visible solutions. Choosing a solution to a problem requires direct consideration of other alternative solutions. Which can be used to confront the situation, and each alternative has consequences when it is chosen as a solution or decision (Al-Bakhit, 2020).

The number and type of alternative solutions depend on several factors, including: the organization's situation, the policies it applies, the philosophy it adheres to, its financial capabilities, the time available to the decision maker, the attitudes of the manager - the decision maker - and his ability to think logically and creatively, which depends on innovative thinking that is based on... It depends on perception, expectation, and ideas behind it, which helps in classifying and arranging recurring alternatives and arriving at a limited number of them (Al-Bakhit, 2020).

4- Choose the appropriate alternative to solve the problem

At this stage, potential solutions or alternatives to solve the problem or confront the situation that will be used in making administrative decisions are identified, and potential alternatives are studied, compared and weighed, based on the available human and material resources, and according to the relevant situations. This comparison depends on many methods, including experience. precedent for the decision maker (Soltwisch, & Krahnke, 2017).

The process of comparison between available alternatives and choosing the most appropriate alternative is carried out according to objective criteria and considerations upon which the manager relies in the selection process, the most important of these criteria (Batayneh, 2020):

- Achieving the alternative to the specific goal or goals. The alternative that achieves the goals or most contributes to their achievement is preferred.
- The alternative agrees with the importance of the organization, its goals, values, systems and procedures.
- The organization's members accept the alternative solution and their willingness to implement it.
- The degree of influence of the alternative on human relations and successful transactions between members of the organization.

- The degree of speed required in the alternative solution, and the time by which the required results are to be obtained.
- The suitability of each alternative with the organization's external environmental factors, such as customs and traditions.
- Values, behavior patterns, consumption patterns, and the factors that this environment can inculcate in terms of helping or hindering each alternative.
- Available information about surrounding environmental conditions.
- The efficiency of the alternative, and the return that will be achieved by following the chosen alternative.

5- Follow up on the implementation of the decision and evaluate it

The decision maker must choose the appropriate time to announce the decision so that the decision produces the best results. When the decision is implemented and its results appear, the manager evaluates these results to see the degree of their effectiveness and the degree of success of the decision in achieving the goal for which it was taken. The follow-up process develops the ability of decision makers or their assistants to achieve accuracy and realism in the analysis during the implementation process, which helps to discover deficiencies, know their causes, and suggest ways to remedy them (Soltwisch, & Krahnke, 2017).

In addition, the process of following up on decision implementation helps develop the spirit of responsibility among subordinates and encourages them to participate in decision-making, as it helps improve the quality of the decision, and makes the decision taken more stable and acceptable to employees, so they work to implement it with great enthusiasm and sincere desire. Participation also leads to achieving mutual trust between the manager and the organization's members on the one hand, and between the organization and the public with whom it deals on the other hand (Galles et al., 2019).

Participation in the decision-making process has an impact on the development of administrative leadership at the lower levels of the organization, increases their sense of responsibility and their understanding of the organization's goals, and makes them more prepared to accept the treatment of problems and implement the decisions they participated in making. Participation in decision-making also helps raise the morale of the organization's members and satisfy the need for respect and self-affirmation (Alkatheeri et al., 2020).

2.2.4 Characteristics and elements of decision making

The administrative decision-making process is characterized by several characteristics mentioned by Aishoush (2018), including:

1- **A mental process**: Decision-making is primarily rational thinking that requires a lot of time and deliberation.

2- **Purposeful process**: The decision is nothing but a means to achieve a specific goal regarding a specific problem or situation, and making decisions is an inherent characteristic of the work of managers, as it has a specific goal that managers seek to achieve.

3- **Selection process**: The decision-making process is based on comparison between the alternatives presented to the decision maker in order to choose the appropriate alternative from among them.

4- **A complex process**: This means that the process is complex with the selection criteria, the environment surrounding the decision, its requirements and circumstances, and the people who are the focus of the decision in making, implementing, and being affected.

5- **Humanitarian process**: Decision making is linked to the humanitarian aspect, whether by the decision maker or those affected by the decision.

6- **Future process**: That is, the effects of decision-making appear in the future, and therefore the decision-maker must have a future vision that contains information about past and present decisions.

The administrative decision-making process consists of several elements, which can be summarized as follows (Aishoush, 2018):

1- **The decision maker**: He may be an individual or a group. He is the one who makes the choice between the alternatives. Whoever the decision maker is, he enjoys the authority granted to him by virtue of his position in the organizational structure or by delegation.

2- **The subject of the decision**: It is the problem that requires solution by the decision maker and is the logical justification for the decision-making process.

3- **Goals and motives**: Every decision has a goal that it seeks to achieve, and as is known in the field of behavioral sciences, behind every behavior there is a motive, and behind every motive there is a need to be satisfied, where achieving the goal is tantamount to satisfying that need, so the more important the satisfaction, the more important the goal.

4- **Data and information**: A good definition of the problem to be decided upon requires the availability of data and information about the nature of the problem, whether this information relates to the past, present, or future.

5- Forecasting: Forecasting helps the decision maker to explore the future, which enables the decision maker to solve the problems facing him.

6- **Available alternatives or solutions**: This means that there is more than one way to confront a particular situation, and these ways are called solution alternatives. The existence of an administrative decision requires the presence of at least two

alternatives for the decision maker to compare between them. The presence of one alternative does not make the manager make a decision.

7- **Constraints**: These are the internal and external conditions that constitute obstacles to the decision maker when making decisions.

2.2.5 Factors influencing decision making

There are a group of factors influencing decision-making, which are as follows: (Aishoush, 2018; Al-Ghosni and Al-Saiti, 2018; Awad, 2021)

1- External environmental factors

These factors are represented by the external environment coming from the environment in which the organization operates and considering that the organization as an open system does not abandon its dealings with the external environment, here we notice that the organization is affected by its external environment, whether they are economic, political and financial factors prevailing in society or technological and social factors, government legislation and laws, and others.

2- Internal environmental factors

They are represented by factors within the organization, which are many factors, including the lack of an information system within the organization that benefits the decision maker, as well as the lack of clarity of the basic objectives of the organization and all information related to the relationship between the organization's departments and their functions.

3- Personal and psychological factors affecting decision-making

Psychological factors are diverse, some of which are related to a person's internal motives, and some are related to the psychological environment related to him and its impact on the decision-making process, especially at the stage of choosing an alternative from the set of available alternatives.

4- Factors of decision circumstances

It is the natural state of the problem in terms of the factors and circumstances surrounding it and influencing it, and the extent of the comprehensiveness of the data and the accuracy of the information available. These are factors that concern the relationship of decisions to the future, which is characterized by the inability to accurately determine what will happen in it, and this is what leads to decision-making either in conditions of uncertainty or Circumstances of certainty or under circumstances of risk.

5- The time factor

The element of time puts great pressure on the decision maker. The greater the period of time available to the decision maker to make his decision, the more alternatives are presented and the results are closer to the correct one.

2.2.6 Decision making quality

defined as the contribution a decision makes to achieving organizational goals (wills, 2022). One of the most dynamic, continuous, difficult, and active topics of leadership study is decision making. Managers must know what decisions to make and keep the interest of all stakeholders involved as the decision they make has consequences. Any organization's success is dependent on the decisions its leaders make (Ejimabo, 2015).

Decision makers can use big data to improve their knowledge and make decisions based on what they know rather than what they think. The quality of data driven decisions is influenced by the strategies used for data gathering and processing as well as the data itself. Applying big data to make better decisions provides some significant managerial challenges. To gain from the use of big data in decision making, it is crucial to overcome challenges with leadership, talent management, technological accessibility, and organizational culture. (Shamim et al, 2019). Five steps may be identified in the big data process, which begins with data collection and ends with decision making; problem

definition, data searching, data transformation, data resolution, and solve the problem. The decision's quality is influenced by the inputs' quality as well as the process's quality in converting inputs into outputs. The properties and quality of the big data sources, the big data analysis process' quality, the capacity and skills of the people involved in its gathering and processing, and the availability of a big data infrastructure are all factors that affect the quality of big data's decision making (Janssen et al, 2017).

The study of Shamim et al, (2019) mentioned that the decision making effectiveness and decision making efficiency are characteristics of the decision making quality process.

- **Decision making effectiveness:**

The degree to which a data-driven decision provides a business to understand customers effectively, make decisions in real-time, and react to change more quickly (Cao and Duan, 2014). A business can better understand the customers through effective decision-making, which can also improve customer satisfaction and loyalty. Businesses are better able to make effective strategic decisions when they have complete and accurate knowledge about the expected relationship between alternatives and outcomes. (Cao, et al, 2019).

Decision-making effectiveness refers to the ability of an individual or organization to make decisions that lead to achieving desired goals with the least amount of time, effort, and resources. This requires careful evaluation of available information and careful analysis of it to make optimal decisions (Grant, 2021).

Organizations should build their organizational structure, mechanism, and business processes in parallel with data analysis strategies that may reduce the environmental uncertainty and ambiguity of the problem context in order to promote high-quality decision making. Enhancing information processing capability through the mediation of a data-driven environment has a positive impact on decision making effectiveness (Wang

and Byrd, 2017). In contrast, intuitive decision-making is very different from analytical decision making as the Analytical one involves finding and evaluating data that is relevant to the decision, measuring costs and advantages, and eventually coming with a decision after careful consideration (Dane, et al, 2012).

The importance of effective decision-making lies in several points, the most important of which are (Heath & Heath, 2020):

- **Achieving goals**: Effective decision-making helps in achieving the desired goals, whether personal or institutional.
- **Reducing risks**: Thoughtful decisions can reduce risks and increase opportunities for success.
- **Increased efficiency**: Effective decision making can increase work efficiency and better direct resources.
- **Building trust**: Successful decisions enhance the confidence of individuals and communities in leaders and managers.
- **Developing skills**: Making decisions contributes to developing individuals' critical and analytical thinking skills.

Levitt and Dubner (2021) believe that there are several factors that can affect the effectiveness of decision-making, and among these factors are:

- **Knowledge and information**: The quantity and quality of information available greatly affects the effectiveness of decision-making.
- **Experience**: Experience plays an important role in an individual's ability to make sound decisions, as experience can help in understanding the context and estimating potential outcomes.

- **Time pressures**: Time pressures may affect the quality of the decision-making process, as severe time pressures can lead to making random decisions without good evaluation.
- **Emotions and feelings**: Emotions and feelings may affect the decision-making process, as negative emotions such as fear or anger can make an individual make ill-informed decisions.
- **Culture and values**: Cultures and values differ between individuals and societies, and these differences can affect the decision-making process.

Bazerman (2016) pointed out that there are several methods that can be used to improve the effectiveness of decision-making, and among these methods are:

- **Data analysis**: Statistical and information analysis can be used to analyze data and extract important patterns and trends for making decisions.
- **Consultation**: Consultation with experts and consultants in the relevant field can help guide the right decisions.
- **Using models and simulations**: Mathematical models and simulations can be used to estimate the likely outcomes of certain decisions.
- **Training and development**: Decision-making skills can be improved through continuous training and development.
- **Relying on artificial intelligence**: Technology and artificial intelligence can be used to support the decision-making process by further analyzing data and providing data-based recommendations.

In short, effective decision making is crucial in the lives of individuals and organizations, as it greatly affects the achievement of goals and the success of operations. By carefully analyzing the situation and using appropriate methods, individuals and

managers can improve the effectiveness of decision making and achieve success in various fields.

- **Decision making efficiency**

the quality of using the resources in the decision making process smoothly such as time, cost, etc. Which leads to make a quality decision (Shamim et al, 2019). A final choice is the result of every decision-making process. The result can be an action, opinion of choice. The decision-makers in a production setting must choose the best advanced manufacturing technique after evaluating a wide variety of alternative possibilities based on a conflicting set of attributes (Sarkar, et al, 2015).

The effectiveness and comprehensiveness of the decisions, as well as the associated expenses, are traded off to determine the decision-making process's quality. Global decisions can be more efficient as they involve detailed analysis of large amounts of data. However, Due to the extensive procedures that must be carried out by a large workforce, they are the most time- and cost-intensive. In contrast, Local decisions involve much simplified decision making processes and are significantly less expensive yet rely on small amounts of data. Efficiency compares the quality of decisions made (online) automatically during operation to decisions made (offline) without access to all relevant state information. High efficiency is essential in practical applications. (Doboli, et al, 2018).

Making decisions is a crucial part of a manager's job. The ability to make quick and right decisions is essential for success. Decisions can greatly impact an organization and its employees, and a bad decision can lead to failure. Good decision-making skills can enhance a manager's reputation and contribute to a thriving company. Predicting the consequences and evaluating the outcomes are vital steps in the decision-making process. Learning from mistakes and improving decision-making skills can make future decisions

easier and more effective. Research and theories have been developed to aid decision-making, as understanding the causes of failure can lead to better decision-making. (Jaiswal et al, 2022)

One strategy for informed decision-making is gathering adequate information to understand the subject. However, this can be challenging due to information interpretation or overload. In such cases, other strategies, like considering multiple potential outcomes, can help improve decision quality. By breaking down decisions into smaller ones, it becomes easier to determine the best course of action. (Kou et al, 2020)

When evaluating managerial decision making, three criteria can be used: judgments on decision quality, decision-making quality, and comparison to potential future outcomes. Decision quality can be rational or good enough for acceptance. Assessing decision-making quality involves comparing decision-makers' processes to optimal strategies, which may not account for successful intuitive decision making (Vakilipour et al, 2021). An alternative approach is to judge decision making as rational if it is informed, consistent, and oriented towards valid ends. Decision analysis can assess decision quality at an organizational level (Parra et al, 2023).

- **Measuring Decision Outcomes**

Measuring decision outcomes is common for evaluating decision effectiveness. For terminal decisions, effectiveness can be measured by comparing before and after. For ongoing processes, effectiveness is measured continuously by comparing projected and actual outcomes. Costs can be tied to specific decision results. Decision making in organizations is linked and one decision can influence the need for another. Assessing the separate results of specific decisions is vital for overall assessment (Cao et al, 2021).

A decision outcome is the result of a decision, whether successful or not. In organizational decision making, success isn't always clear, and decisions are not always seen as right or wrong. Effectiveness is judged by problem resolution, goal achievement, efficiency, cost-effectiveness, and the need for modification. Decision makers compare task accomplishment to intended goals. Feedback is crucial for understanding decision success (Burton et al, 2020).

- **Assessing Decision-Making Processes**

There are various ways to measure decision-making processes. However, consensus on the best approach is lacking. Some researchers use think-aloud techniques, but this is time-consuming and can impact decisions. Others analyze transcripts of verbalizations, but coding is subjective and can alter data. Objective measures are considered the most reliable. They can be taken at a behavioral or process level. Behavioral measures focus on option selection and compare decisions to a normative model. Process measures identify heuristics and search strategies and assess their impact on the final decision. Computer simulation is often used for more accurate results. (Cerda & García, 2021).

- **Learning from Past Decisions**

Learning from experience is crucial in decision-making. It helps determine if the desired outcomes are being achieved and guides corrective action if needed. Decision makers should have a result monitoring strategy to track progress. If unsatisfactory results are found, the cause can be identified and steps taken to improve the situation. Learning can also reinforce successful decisions or prevent future errors (Romualdez et al, 2021).

- **The researcher point of view regarding the literature review**

Based on the previous concepts and details of big data and the decision-making process, the researcher noticed that there is a great importance in studying big data and

its analytics, knowing its advantages and methods of analyzing it, and conducting continuous studies to develop concepts and keeping pace with technological development to improve the analytical capabilities of big data, as data is increasing and developing rapidly in this era.

The researcher also noticed that the importance of the quality of decision making process, as it directly or indirectly affects achieving the company's goals and obtaining a competitive advantage in the market. The company's resource capabilities should also be developed to make high-quality decisions and utilize resources efficiently and effectively.

2.3 Zain Jordan company

Zain Group, which is the mobile telecommunications group "Zain", was established in 1983 as the first mobile telecommunications services operator in the Middle East and Africa region, and has a subscriber base exceeding 45.2 million subscribers (as of the end of June 2017).

Zain is one of the companies contributing to the field of mobile communications in the Middle East and North Africa region. It enjoys a distinguished geographical spread, thanks to its presence in 8 countries, and provides its services in the markets of Kuwait, the Kingdom of Bahrain, the Kingdom of Saudi Arabia, the Hashemite Kingdom of Jordan, and Iraq. Sudan, South Sudan, and Lebanon (management contract), in addition to Morocco through its ownership of a 15.5% stake in the Moroccan company Inwi. Zain considers itself a major partner for the communities in which it provides its services, and seeks to ensure that its economic, social and cultural projects contribute to making a positive impact on people's lives

(https://ar.wikipedia.org/wiki/%D9%85%D8%AC%D9%85%D9%88%D8%B9%D8%A9_%D8%B2%D9%8A%D9%86).

The Jordanian Mobile Telephone Services Company Limited (Zain) revolutionized the telecommunications markets in the Kingdom in 1995 by offering GSM mobile communications services. What confirms Zain's leadership in the mobile telecommunications sector locally and regionally is its leadership in offering many new services in the markets to keep pace with the latest technology in various fields. Since its establishment, Zain has sought to expand its customer base, as their number today has reached more than 5.903 million customers. The company provides its services to all its customers through more than 6,325 operating stations, covering the entire populated area in Jordan (https://www.naua.org/com).

In conjunction with its investment in the latest technologies and services that enrich the lives of its customers, Zain also developed the most active corporate social responsibility and entrepreneurship programs, by supporting education, health care, youth and sports. Zain is considered one of the pillars of the Jordanian national economy, as it includes about a thousand Jordanian employees and provides indirect job opportunities for many thousands more(https://www.jo.zain.com/arabic/Pages/about-us.aspx).

2.4 Previous studies:

There are several previous studies directly or indirectly related to the subject of the current study. The researcher summarized a group of them and arranged them according to the chronological order from oldest to newest, as follows:

Jeble, et. al. (2018) study entitled **"Impact of Big Data & Predictive Analytics Capability on Supply Chain Sustainability"**. The aim of this study is to develop a theoretical model that explain the impact of big data and predictive analytics (BDPA) on sustainable business development goal of the organization. Their methodology was developing a theoretical model using resource based view (RBV) logic and contingency

theory (CT). The model was tested using PLS-SEM (partial least squares- Structural Equation Modelling) and they gathered 205 responses using survey based instrument for PLS-SEM. The findings as statistical results indicate how BDPA as an organizational capability may help organization's initiative to improve environmental, social and economic performance of the organization and suggest that out of four study hypotheses, they found support for three hypotheses (H1-H3) and they did not find support for hypothesis H4. Although, we did not find support for H4 (moderating role of supply base complexity (SBC)). Also, they recommended that the relationship between BDPA, SBC and sustainable supply chain performance measures remain interesting study questions for further studies.

Mikalef et al. (2019) study entitled: **"Big data analytics capabilities and innovation: the mediating role of dynamic capabilities and moderating effect of the environment"**. This study investigates the indirect relationship between a firm's big data analytics capability (BDAC) and two distinct types of innovation capabilities: incremental and radical. It builds upon prior studies by suggesting that BDACs empower firms to generate insights, thereby fortifying their dynamic capabilities. Consequently, these dynamic capabilities exert a positive influence on both incremental and radical innovation capabilities. To validate their proposed research model, they collected survey data from 175 chief information officers and IT managers employed in Greek companies. Utilizing partial least squares structural equation modeling (PLS-SEM), their findings affirm their hypotheses concerning the indirect influence of BDACs on innovation capabilities. Specifically, they observe that dynamic capabilities serve as full mediators of the effect on both incremental and radical innovation capabilities. Moreover, in contexts of high environmental heterogeneity, the impact of BDACs on dynamic capabilities, and subsequently on incremental innovation capability, is heightened.

Conversely, in environments characterized by high dynamism, the effect of dynamic capabilities on incremental innovation capabilities is amplified.

Shamim, et. al. (2019) study entitled **"Role of big data management in enhancing big data decision-making capability and quality among Chinese firms: A dynamic capabilities view"**. This study aims to examine the influence of big data decision making capabilities on decision making quality among Chinese firms and proposed that such capabilities are influenced by big data management challenges such as leadership, talent management, technology, and organizational culture. They used primary data from 108 Chinese firms and utilizing partial least squares, they tested the antecedents of big data decision making capability and its impact on decision-making quality. The results suggest that big data management challenges are the key antecedents of big data decision making capability. Moreover, the latter is crucial for big data decision-making quality.

Oncioiu, et. al. (2019) research entitled **"The Impact of Big Data Analytics on Company Performance in Supply Chain Management"**. This research purpose is to study how big data analytics can help Romanian supply-chain companies assess their experience, strategies, and professional capabilities in successfully implementing big data analytics, as well as assessing the tools needed to achieve these goals. The research method used was a sampling survey, using a questionnaire as a data collection tool. It included closed questions, measured with nominal and ordinal scales. A total of 205 managers provided complete and useful answers for this research. The data were analyzed with the Statistical Package for the Social Sciences (SPSS) package using frequency tables, contingency tables, and main component analysis. The results highlighted the fact that companies are concerned with identifying new statistical methods, tools, and

approaches, such as cloud computing and security technologies, that need to be rigorously explored.

Alkatheeri, et. al. (2020) research entitled **"The Effect of Big Data on the Quality of Decision-Making in Abu Dhabi Government Organizations"**. This research discussed the literature related to the quality of big data and its effect on the quality of decision-making. A descriptive methodology approach was adopted by reviewing the literature of published and unpublished scientific research along with a questionnaire involving participants from Abu Dhabi Police Agencies to collect their views and opinions in this area. The results led to proposing a theoretical, conceptual model according to the quantitative and numerical methodology. this research also revealed that the quality of big data predicts the quality of decision-making and that the quality of big data in Abu Dhabi Governmental Organizations plays a significant role in the quality of decision-making.

AL-Ma'aitah, (2020) study entitled **"Utilizing of Big Data and Predictive Analytics Capability in Crisis Management"**. This study investigates the impact of Big Data and Predictive Analytics (BDPA) capability on crisis management in the Greater Amman Municipality (GAM), Jordan. A 32 item questionnaire was developed which was completed by 140 participants with128 responses deemed suitable for research analysis. He used PLS2 to analyze the data. The study results confirm that the Greater Amman Municipality has medium levels of big data availability and predictive analytics capability overall and demonstrate that BDPA capability has a significant impact on crisis management. He recommended that organizations to enhance their ability to utilize big data through expanding their tangible resources infrastructure and to improve the

technical skills of their staff by providing the necessary training for performing big data analysis.

Al- Sheti's study (2021) entitled: "**Big Data Analytics in Saudi Banks: Its Reality and the Level of Utilization in Supporting Financing Decisions**" This study aimed to identify the reality of using big data analytics, and the role it can contribute to supporting decision-making. To achieve the goal of the study, the researcher adopted the descriptive analytical approach. The study sample consisted of (40) individuals from managers and employees working in Saudi banks, and (100) individuals from credit card customers in those banks, where the sample was selected by a simple random method. The study concluded that there is an integrated infrastructure for information and communications technologies, an integrated database that includes all departments, and at a high level, and that there are differences in big data analytics between the age group (20-29 years) and the age group (over 40 years) in favor of the age group (over 40 years).

Eid's study (2021) entitled: "**The Impact of Big Data Management on the Effectiveness of Administrative Decisions: An Applied Study on the National Bank of Egypt**" This study aimed to identify the impact of big data management on the effectiveness of administrative decisions. To achieve the goal of the study, the researcher adopted the descriptive analytical approach, through a random sample consisting of (370) individuals from employees of the National Bank of Egypt. The questionnaire was distributed to them as a tool for collecting information. The study reached a set of results, the most important of which are the weakness of the financial capabilities and human capabilities to manage big data at the National Bank of Egypt, and the existence of a statistically significant relationship between the dimensions of big data management (the

physical capabilities to manage big data - the appropriate regulatory environment for managing big data) and the effectiveness of administrative decisions.

Hammad's study (2021) entitled: "**The Impact of Big Data Applications on Improving Human Resource Management Practices: A Field Study on International Information Technology Companies in Egypt**. "This study aimed to identify the impact of big data applications on improving human resources management practices. To achieve the goal of the study, the researcher adopted the descriptive analytical approach, where a survey form was designed and distributed to the study sample of (204) individuals working in international information technology companies in Egypt. The study reached many results, the most important of which is the existence of a statistically significant relationship between big data applications and improving human resources management practices, and the presence of strength in the dimensions of big data applications represented by knowledge of tools for organizing big data applications, senior management support for using big data applications, and the availability of expertise. Dealing with big data applications, availability of infrastructure for big data applications.

Ayokanmbi, (2021) study entitled: **"The impact of big data analytics on decision-making".** This study shows that utilizing the technologies of industry 4.0 is essential for fostering a fact-based and data-driven culture which are vital for attaining outstanding performance. A significant volume of data is produced by various digital devices, including smartphones, social media platforms, personal computers, and wearable tech. Data consists of unprocessed facts which, upon processing, yield insights and knowledge crucial for guiding decision-making processes. Big Data Analytics (BDA) offers the means to extract value from large datasets, enhancing the quality of decision-making. This paper explores how big data and advanced analytical methods influence decision-

making quality and enhance organizational performance to reach excellence. Integrating big data analytics capabilities with organizational resources and competencies is crucial for achieving performance excellence. Effectively extracting knowledge and valuable insights from big data can elevate strategic decision-making, leading to performance excellence and competitive advantage.

A study by Al-Ajmi et al. (2022) entitled: "**The impact of big data and some of its variables on decision-making during the period of the spread of the Covid-19 pandemic from the perspective of students at the College of Basic Education in the State of Kuwait**." This study aimed to find out the extent to which individuals in societies are affected by the use of big data in making decisions. To achieve the goal of the study, the researchers adopted the descriptive analytical approach, where they developed a research model that includes a group of factors including data awareness, the use of big data, and data-task suitability, in order to identify The extent of its impact on decision-making processes related to the procedures associated with the spread of the COVID-19 pandemic. The study sample consisted of (254) male and female students in the Library and Information Sciences program at the College of Basic Education in the State of Kuwait. The questionnaire was distributed to them as a tool for collecting information. The results of the study indicated that there was an effect of the data awareness variable on the variable of using big data and the variable of decision-making at the individual level. There was also an effect of the variable of using big data on decision-making, but that effect was only through the variable of data suitability - tasks; The results did not show a statistically significant relationship between the variable of using big data and the variable of decision making.

Alqahtani, (2023) study entitled: **"Mining in big data and its impact on decision-making from the point of view of managers and heads of departments of administrative units in the Ministry of Health in the Kingdom of Saudi Arabia"**. This study aimed to clarify the perspectives of managers and department heads within administrative units of the Ministry of Health regarding the impact of big data mining and decision-making. Additionally, it aimed to ascertain any statistical differences in responses of department heads and managers, as well as the degree to which their personal and professional characteristics influence them. The study population comprised directors and department heads at the Ministry of Health, with a random sample of 168 individuals selected for analysis. The study reached the following conclusions: The four facets of big data mining identified in this research significantly influence decision-making process. Among these elements, the importance of big data mining, the requirements for the use of big data mining, the areas of use of big data mining were identified as the most impactful. The research demonstrated that for the majority of the study sample, including managers and department heads of administrative units, there were no statistically significant differences in the influence of big data mining on decision-making based on personal and functional variables. The study recommended the importance of offering sufficient training opportunities to keep up with the rapid evolution of relying on big data mining for decision-making. It also suggested disseminating the concept of big data mining among managers and department heads. The study proposed that it should be a priority for the Ministry of Health to formulate a comprehensive strategic vision for the implementation and utilization of big data mining. It also suggested leveraging previous experiences from international organizations and institutions in this regard.

Study by Chatterjee et al. (2023) entitled: **"Assessing the impact of big data analytics on decision-making processes, forecasting, and performance of a firm"**.

The utilization of Big Data Analytics (BDA) in firms spans across various applications. However, the literature lacks comprehensive studies that investigate the collective influence of BDA on critical aspects such as forecasting, decision-making, and overall firm performance. This gap highlights the need for further research in this area. This study aims to investigate the impact of BDA on the process of decision-making, forecasting, as well as firm performance. By utilizing the Resource-Based View (RBV) and the Dynamic Capability View (DCV), along with relevant research studies, a conceptual research model was proposed. The validation of this conceptual model was conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, employing data collected from 366 respondents representing Indian firms. This study underscores that employing Big Data Analytics (BDA) facilitates smart decision-making and enhances the accuracy of forecasting processes. Furthermore, the research demonstrates a significant impact of BDA adoption on the decision-making process, forecasting accuracy, and overall firm performance. However, it's important to acknowledge that the current study is limited by its reliance on cross-sectional data, which may introduce issues related to causality and endogeneity bias. Additionally, the research found that various control variables had no impact on firm performance.

Al-Zubaidi and Al-Zayadi's (2023) study, entitled: "**Exploring the relationship between big data analyzability and organizational performance: The mediating role of organizational flexibility: An analytical research in Iraqi telecommunications companies**." This study aimed to identify the potential of analyzing big data on organizational performance and to diagnose the mediating role of organizational flexibility in this relationship. To achieve the goal of the study, the researcher adopted the descriptive analytical method. The study sample consisted of (131) workers in Iraqi telecommunications companies who were selected by a simple random method and

distributed They should use the questionnaire as a tool for collecting information. The study found that the ability to analyze big data directly affects organizational flexibility and organizational performance, and that organizational flexibility partially mediates the relationship between the ability to analyze big data and organizational performance.

What distinguishes the current study from previous studies?

This study focused on variables collected from above mentioned studies to examine its effect, such as the study of the impact of big data analytics capability on decision making quality. According to previous studies there are knowledge gaps in these variables, so this study will emphasize the areas which were not studied in previous studies which hope the findings will enhance the knowledge for future studies.

This study will be applied on the Arabic environment, where these variables have not been studied in the Arabic environment in previous studies. Besides the current study will focus on a very important sector which is telecommunication in Jordan and has not considered yet in previous studies.

Chapter Three

Study Methodology and Procedures

This chapter is devoted to present the methods and procedures that will be followed in this study, in terms of the type of study, its nature, and the strategy followed in it. The study population, the sample, how to choose it, and an explanation of the study tool, and the most important statistical methods that will be used in data processing and drawing conclusions will also be made.

Considering the assessment of relevant literature and discussion of the model relating to this study, the next step is to determine the research methodology. The design ensures that the relevant data could be assembled and evaluated to satisfy the corresponding research queries and in-turn better accommodate the goals of the study.

3.1 Study design and methodology

The Researcher describe the phenomenon of Big Data Analytics Capability and Decision-Making Quality at Jordanian Telecommunication, and analyze the data that obtain in different ways, to identify the impact of big data analytics capability on decision making quality: A Case Study on Zain Telecommunication Company in Jordan.

3.2 Type and nature of the study

The researcher relies on the descriptive and analytical approach, which aims at a realistic study of the phenomenon and its accurate description and expressions in a descriptive and quantitative expression.

3.3 The strategy followed in the study

The study strategy is the cornerstone of study design, and it describes the general plan that the researcher intends to obtain answers to his study questions, and there is a wide

range of strategies in the study design, and in this study the case study will be used to determine the impact of big data analytics capability on decision making quality.

3.4 Study population

The study population consisted of employees at the upper, middle and low administrative levels from the various departments in Zain telecommunication company in Jordan, the number is (350) individuals, and the study population was counted through the researcher's inquiry in their Human resource department.

3.5 Study Sample

According to Sekaran & Bougie, (2016) table for statistical samples, the sample representing the selected population is (180). The researcher selected a convenient random sample and distributed (180) questionnaires through the departments for precaution, after that he received and filtered (144) questionnaires that are valid for the purposes of statistical analysis.

3.6 Data collection procedure

Data collection plays a very crucial role in statistical analysis. In research, there are different methods used to gather information, these data can be classified into two main groups: primary and secondary data (Sekaran & Bougie, 2016). Primary data is information that researchers gather directly from sources like surveys, questionnaires, interviews notes and case studies according to their needs. In contrast, secondary data, while easier to access, isn't as pure due to undergoing several statistical procedures. Secondary data sources are government publications, websites, books, press articles, and internal records (Ajayi, 2017). Accordingly, the current study will depend on two sources of data, as follows:

- **First, secondary sources:**

researcher collected data related to the current study by referring to secondary data sources, which are represented in references that included books, theses, periodicals, previous studies, scientific studies and articles that dealt with the subject, in addition to the Internet, pamphlets and documents related to the study subject.

- **Second, primary sources:**

The researcher devised a questionnaire aimed at directly obtaining data from the study participants. This questionnaire contained questions specifically addressing the variables being investigated.

With respect to the gathering of data, the English language used as a medium of communication in the questionnaire. However, given that English is neither the native nor the official language in Jordan, the questionnaire was translated into Arabic to ensure full comprehension by the respondents.

3.7 Study Variables

- **Independent variable**: big data analytics capability which has five sub variables: (tangible resources, technical skills, management skills, organizational learning and data driven culture).
- **Dependent variable**: Decision making quality which Has two sub variables: (decision making effectiveness and decision making efficiency).

3.8 Study tool

The researcher has developed a questionnaire as a study tool based on previous studies **(Jeble et al, (2018); Mikalef et al, (2019) and Shamim et al, (2019))** with the aim of collecting information from respondents, as the questionnaire is one of the most

important information gathering tools in most analytical studies (Ajayi, 2017).

The questionnaire consisted of three parts, as follows:

- **Part one (demographic and occupational information)**, which includes: (gender - Educational level - age - years of experience- management level)
- **Part Two - Paragraphs of the independent variable dimensions (Big data analytics capability), which includes five dimensions:**
  - First dimension: Tangible resources (paragraphs 1-5).
  - Second dimension: Technical skills (paragraphs 6-9).
  - Third dimension: Management skills (paragraphs 10-13)
  - Fourth dimension: Organizational learning (paragraphs 14-17)
  - Fifth dimension: Data driven culture (paragraphs 18-20)
- **Part Three - Paragraphs of the Dependent Variable dimensions (decision making quality), which includes two dimensions:**
  - First dimension: Decision making effectiveness (paragraphs 21-24).
  - Second dimension: Decision making efficiency (paragraphs 25-28).

Scores were assigned to each paragraph of the study tool to identify the level of agreement among the study sample regarding the paragraphs that related to the variables in the study model, according to the five-level Likert scale, as follows:

Answer	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
Level	5	4	3	2	1

The following equation was also relied upon to determine the relative importance adopted by the study to comment on the arithmetic mean of the variables, which are:

Relative importance = (maximum alternative - minimum alternative)/number of levels

= (5-1)/3 = 1.33

First: (less than 2.33) low approval.

Second: (from 2.33 - less than 3.67) moderate approval.

Third: (from 3.67 - 5) high approval.

3.9 Validity of the study tool

The validity of the study tool was established through: Face Validity and Construct Validity, as follows:

1- Face Validity

To check the face validity of study tool, a researcher presented questionnaire to a group of specialist academics within field of management in the profession and university professors (6 referees) listed in the appendix (2), in order to express their opinion in paragraphs in terms of drafting linguistic, and the extent of the affiliation of its paragraphs dimensions, and the extent It was valid for what it was developed for, and it was modified according to the referee's directives, as some paragraphs were changed or deleted, and amendments were made.

2- Construct Validity

Construct validity is "the degree to which a test measures what it claims, or purports, to be measuring" (Flake et al, 2022), According to Guion (1980) Construct validity refers to the suitability of drawing conclusions based on observations or measurements, such as test scores, particularly regarding whether a test accurately evaluates the intended construct. Constructs are abstractions that are deliberately created by researchers in order to represent the latent variable, which is associated with scores on a specific measure, even though it cannot be directly observed. In construction honesty, attention is focused

on the fact that each of the study variables is accurately represented by a group of paragraphs or phrases. And that these paragraphs already measure this variable, in this study the construct validity was measured through Confirmatory Factor Analysis (CFA) as below:

- **The confirmatory factor analysis (CFA)**

To test the validity of the confirmatory factor analysis, the researcher used the AMOS program. The results of this analysis were as follows:

1- The validity of the confirmatory factor analysis for the dimensions of the independent variable (Big data analytics capability).

Figure (3-1) shows the confirmatory factor analysis of the independent variable (Big data analytics capability), according to the AMOS program, and the figure presents the standard regression weights for each dimension of the independent variable's dimensions, which are supposed to be representative of a part of this independent variable.

It is noted from the figure that the lowest value reached is (0.48), which is the value of (q1) in the tangible resource dimension, and since this value represents the least extracted value and surpasses the accepted value of 0.40 in confirmatory factor analysis (Hair, et al, 2010), they are considered sufficient and express acceptable standard regression weights for the dimensions of the independent variable.

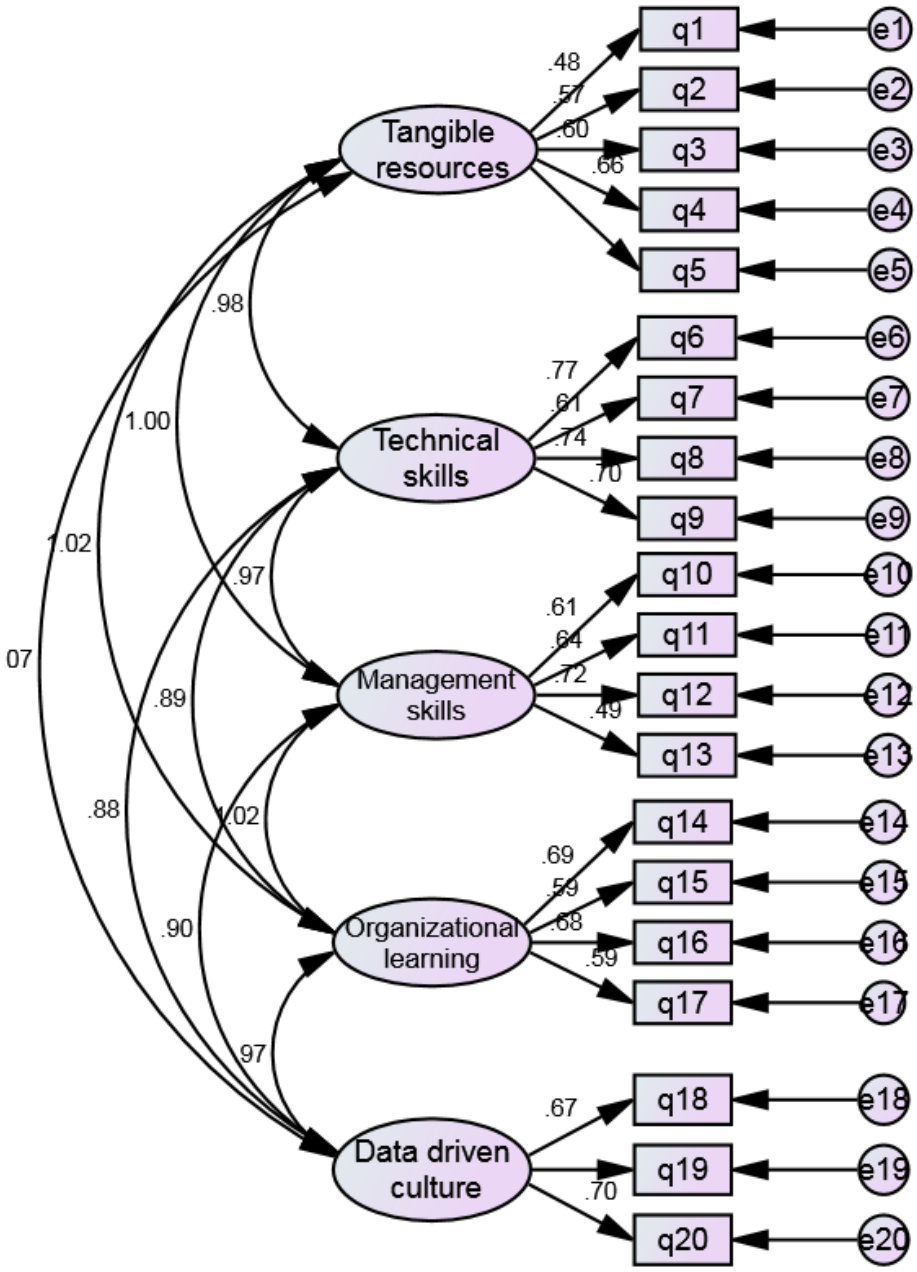

Figure (3-1): Confirmatory factor analysis of the independent variable (Big data analytics capability)

2- The validity of the confirmatory factor analysis for the dimensions of the dependent variable (decision making quality).

Figure (3-2) shows the confirmatory factor analysis of the dependent variable (decision making quality), according to the AMOS program, and the figure presents the standard regression weights for each dimension of the dependent variable's dimensions, which are supposed to be representative of a part of this dependent variable.

It is noted from the figure that the lowest value reached is (0.48), which is the value of paragraph (q22) in the decision making effectiveness dimension , and since this dimension value represents the least extracted value and surpasses the accepted value in the confirmatory factor analysis of (0.40) (Hair, et al., 2010), they are considered sufficient and express acceptable standard regression weights for the dimensions of the dependent variable.

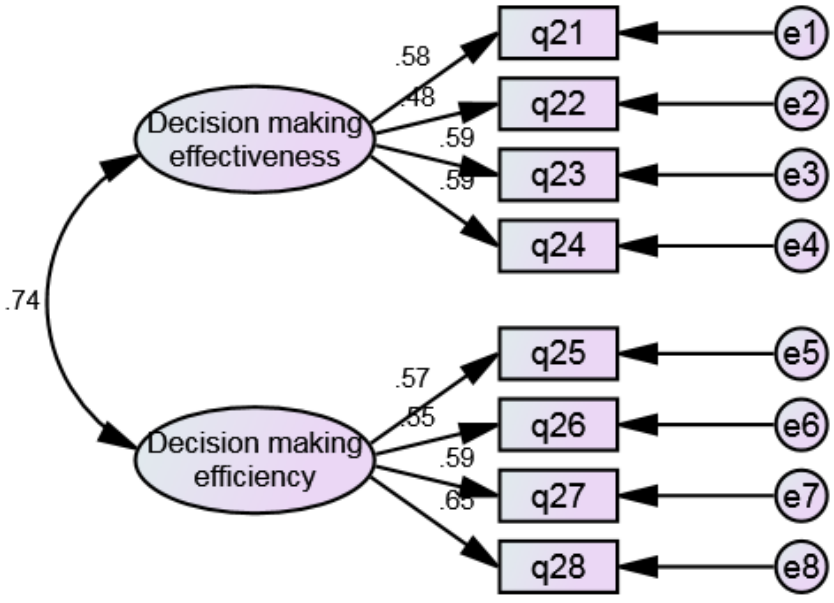

Figure (3-2): Confirmatory factor analysis of the dependent variable (decision making quality)

3.10 Reliability of the study tool

The reliability test of the study tool aims to ensure the stability of the study tool, the consistency and stability of the answers of the respondents on its various paragraphs (Sekaran & Bougie, 2016). The reliability of the study tool was tested through (testing - retesting), and the (Alpha Cronbach) coefficient test.

1- Reliability using test and retest

The researcher chose a sample from outside the study sample of (20) individuals, and distributed to them the study tool and collected their answers, after a period of time (week) the study tool was distributed to the same sample, and their answers were collected, then researcher compared the results from the sample for the first time (testing) and the results from the sample for the second time (re-testing) using the Intraclass Correlation Coefficient, the results came as shown in Table (3-1).

Table (3-1) The intraclass correlation coefficient test for the study Dimensions

Dimensions	Correlation Value	Significance Level
Tangible resources.	0.661	**0.00
Technical skills.	0.862	**0.00
Management skills.	0.791	**0.00
Organizational learning.	0.722	**0.00
Data driven culture.	0.662	**0.00
Decision making effectiveness	0.687	**0.00
Decision making efficiency	0.729	**0.00
Study tool	**0.779**	****0.00**

****Significant at (0.01)level**

The data in Table (3-1) indicate that the values of the correlation coefficients between the study dimensions in the test and re-test were all less than the statistically acceptable error (0.01), which is statistically significant, as the value of the correlation between the answers of the study sample in test and re-test was Dimension (Tangible resources) (0.661), dimension (Technical skills) (0.862), dimension (Management skills) (0.791), dimension (Organizational learning) (0.722), dimension (Data driven culture) (0.662),

dimension (Decision making effectiveness) (0.687), dimension (Decision making efficiency) (0.729), and dimensions As a whole (0.779), which indicates the reliability of the study tool.

2- Reliability by Cronbach's alpha method.

To ensure the reliability of the questionnaire (the study tool), the researcher conducted the internal consistency according to the "Cronbach's alpha" coefficient for all study variables, which indicates that the study tool has an acceptable level of stability at an alpha value greater than or equal to (0.70), and an alpha value is close to (100). %) provides higher reliability of the study tool (Sekaran & Bougie, 2016). The results were as follows:

First - Reliability of the independent Variable (Big data analytics capability)

Researcher calculated the stability level for the dimensions of the variable (Big data analytics capability) separately, and then calculated the stability for the combined dimensions, according to the (Cronbach-Alpha) coefficient. The paragraphs of questioner considered to have internal consistency and stability, as the value of the Cronbach alpha coefficient reached 70% as a minimum (Sekaran & Bougie, 2016). Table (3-2) shows the results of the stability test:

Table (3-2)Reliability of the independent variable (Big data analytics capability) using Cronbach's alpha (n = 144)

Dimensions	No. of paragraph	Cronbach's alpha coefficient
Tangible resources.	**5**	**0.736**
Technical skills.	**4**	**0.774**
Management skills.	**4**	**0.717**
Organizational learning.	**4**	**0.752**
Data driven culture.	**3**	**0.725**
Big data analytics capability	**20**	**0.892**

Table (3-2) shows that "Cronbach's alpha coefficient for all dimensions of the independent variable (Big data analytics capability) amounted to (0.892), and the

Cronbach alpha coefficients for all dimensions of the independent variable separately were high and greater than (70%), and based on the aforementioned rule. Previously, all values were greater than 70%, and this indicates the stability of the paragraphs.

Second - Reliability of the dependent variable (decision making quality)

Researcher calculated the stability level for the dimensions of the variable (decision making quality) separately, and then calculated the stability for the combined dimensions, according to the (Cronbach-Alpha) coefficient. The paragraphs of questioner considered to have internal consistency and stability, as the value of the Cronbach alpha coefficient reached 70% as a minimum. Table (3-3) shows the results of the stability test:

Table (3-3)Reliability of the dependent variable (decision making quality) using Cronbach's alpha coefficient (n = 144)

Dimensions	No. of paragraph	Cronbach's alpha coefficient
Decision making effectiveness	**4**	**0.77**
Decision making efficiency	**4**	**0.721**
decision making quality	**8**	**0.827**

Table (3-3) shows that "Cronbach's alpha coefficient for all dimensions of the dependent variable (decision making quality) amounted to (0.827), and the Cronbach alpha coefficients for all dimensions of the dependent variable separately were high and greater than (70%), based on the aforementioned rule. Previously, all values were greater than 70%, and this indicates the stability of the paragraphs.

3.11 The suitability of the study model to the statistical methods used

This part of the study aims to verify the suitability of the study model to the statistical methods used. This is achieved by validating the study data and its adequacy for conducting parametric tests and this involves conducting a normal distribution test.

- Normal distribution test

Researcher used the Kolmogorov-Smirnov (K-S) test to verify that the data that was used for the purposes of statistical analysis and hypothesis testing follow a normal distribution.

Table (3-4) Normal distribution using the Kolmogorov-Smirnov(K-S) test

Dimensions	Test Value	Significance Level
Tangible resources.	0.137	0.127
Technical skills.	0.110	0.132
Management skills.	0.144	0.229
Organizational learning.	0.184	0.189
Data driven culture.	0.187	0.212
Decision making effectiveness	0.168	0.115
Decision making efficiency	0.112	0.124

Table (3-4) shows that the data for the current study followed the normal distribution approach and showed that there were no statistical differences between the distribution of variable values and the values of the normal distribution at the level of significance ($\alpha \leq 0.05$).

3.12 Statistical methods used

To process and analyze the data collected through the study tool, as well as to test the study hypotheses, the researcher employed various descriptive and inferential analyses. These analyses were conducted using the Statistical Package for Social Sciences (SPSS). The following statistical methods were utilized:

First, the descriptive analysis methods

The researcher used many descriptive analysis methods to characterize the data related to the study sample members, as well as to describe the dimensions and variables of the study model. These methods were represented in the following:

1- **Frequencies and percentages**, to clarify the demographic data of the participants included in the study sample.

2- **Mean and standard deviations**, to characterize the dimensions and variables of the study model based on the responses provided by sample members to various items.

Second, the methods of inferential analysis

The researcher used many methods of inferential analysis in order to verify the data of the study and its validity, and to test its hypotheses. These methods were represented in the following:

1- Confirmatory factor analysis for measuring the construct validity of the study tool.

2- The internal consistency coefficient (Alpha Cronbach), to measure the reliability of the study tool.

3- Normal distribution test (Kolmogorov-Smirnov(K-S)) to ensure that the data utilized for statistical analysis and hypothesis testing adhere to a normal distribution.

4- multiple Linear Regression analysis, to test the main hypothesis and simple linear Regression to test the sub two hypotheses.

Chapter Four:

Data Analysis and Hypothesis Testing

In this chapter, the study results are presented by analyzing the data obtained from the answers from the study sample related to the study questions that aimed to identify the Impact of Big Data Analytics Capability on Decision Making Quality: A Case Study on The Jordanian Telecommunication Organization Zain. The sections below present the results.

4.1 Description of the characteristics of the study sample

To achieve an accurate description of the characteristics of the study sample, frequencies and percentages were used, with the characteristics being personal and functional data represented by gender, age, educational level, years of work experience, and job title. Table 4-1 shows the results of the analysis of these variables.

Table (4-1) Distribution of the study sample according to their personal and functional data

Variable	Category	Frequency	Percentage
Gender	Male	86	59.7%
	Female	58	40.3%
Total		**144**	**100.0%**
Age	Younger than 30 years	60	41.7%
	30 – less than 35 years	42	29.2%
	35 – less than 40 years	34	23.6%
	40 years and above	8	5.6%
Total		**144**	**100.0%**
Educational Qualification	Bachelor’s	135	93.8%
	High Diploma	00	00
	Master's	9	6.3%
	PhD	00	00
Total		**144**	**100.0%**
Years of Experience	Under 5 years	48	33.3%
	5 to 9 years	50	34.7%
	10 to 14 years	38	26.4%
	15 years and over	8	5.6%
	Total	**144**	**100.0%**
Management level	Top - level management	5	3.5%
	Middle - level management	50	34.7%
	First - level management	89	61.8%
Total		**144**	**100.0%**

Table (4-1) shows that the vast majority of the study sample members were male, with 86 individuals constituting 59.7% of the total study sample, while the number of

females was 58, constituting 40.3% of the sample. This can be explained by the fact that most of the employees of Zain company are male, so in fact the percentage of females is relatively high, indicating the existence of a kind of leadership, independence and empowerment of women, especially in the conservative Jordanian society.

The previous table also shows that most of the sample members were within the age group (Younger than 30 years), as their number reached (60) individuals, constituting (41.7%), and this is proportional to The nature of the study sample members who work at Zain Telecommunications Company within the upper, middle and supervisory management levels, because the specializations related to technology and communications and the experience in this field are relatively new.

Regarding the educational level, it is noted that most of the sample members were within the (Bachelor's) level by a percentage (93.8%), and a percentage of (6.3%) were at the (Master's) level. This result is explained by the fact that most administrative jobs require a bachelor's degree in a specific specialty as a minimum for employment or work, and Jordanian society is by nature educated, meaning that a large percentage of its individuals are bachelor's degree graduates.

The data in the previous table indicate that a percentage of (34.7%) of the study sample has practical experience ranging from (5 to 9 years), and they are the majority, and that most of them are at the administrative level (First - level management) with a percentage of (61.8%) and this is consistent with the nature of the organizational structure, which indicates that the higher the administrative level, the smaller the number of workers at this level.

4.2 Analysis of the study dimensions and variables

This part of the study presents a description of the study dimensions and variables, by analyzing the answers of the study sample members to the items designated for measurement in the study tool. The results are shown in the following tables.

4.2.1 Dimensions of the independent variable (Big data analytics capability)

The means and standard deviations of the responses from the study sample members regarding the dimensions of Big data analytics capability were extracted, and shown in Table (4-2).

Table (4-2) Means and relative importance of the sample member estimates of the dimensions of Big data analytics capability

No	Dimension	Mean	Rank	Relative importance
1	Tangible resources.	3.65	3	Moderate
2	Technical skills.	3.65	5	Moderate
3	Management skills.	3.65	4	Moderate
4	Organizational learning.	3.67	2	High
5	Data driven culture.	3.69	1	High
Big data analytics capability as a whole		**3.66**		Moderate

It is clear from Table (4-2) that the relative importance of the dimensions of the big data analytics capability variable was moderate, as the general arithmetic average was 3.66. The (Data driven culture) dimension came first, with an arithmetic mean of 3.69 and a high relative importance, while the dimension of (Technical skills) was in last place with an arithmetic mean of 3.65 and a moderate relative importance.

After the averages of the respondents' answers were calculated regarding the dimensions of big data analytics capability as a whole, they were then calculated for the paragraphs of each dimension, with the following results.

1- Tangible resources

Table (4-3)Means and standard deviations of the sample members' answers to the Tangible resources dimension

No	Paragraph	Mean	St. Deviation	Relative importance
1	The company's management provides sufficient funding for its big data analytics projects	3.83	0.58	High
2	The company's management provides access to the unstructured big data	3.55	0.61	Moderate
3	The company's management integrates data from multiple sources into its data storage.	3.67	0.61	High
4	The company's management adopts new forms of databases	3.58	0.63	Moderate
5	The company's management adopts an open source software for big data analytics	3.62	0.61	Moderate
Average mean		**3.65**		**Moderate**

It is clear from Table (4-3) that the level of relative importance of the tangible resources dimension was moderate, with a general arithmetic mean of 3.65. Statement (1) "The company's management provides sufficient funding for its big data analytics projects" came in first place with an arithmetic average of 3.83 and a high relative importance, while statement (4), "The company's management adopts new forms of databases" was in last place with a mean of 3.58 with moderate relative importance.

2- Technical skills

Table (4-4)Means and standard deviations of the sample members' answers to the Technical skills dimension

No	Paragraph	Mean	St. Deviation	Relative importance
6	The company's management provides technical staff with appropriate skills in big data analytics	3.66	0.66	Moderate
7	The company's management adequately trains its big data analytics staff	3.70	0.62	High
8	The company's management attracts staff with specialized educational skills in big data analytics	3.57	0.61	Moderate
9	The company's management provides a convenient environment to develop the skills of its staff in big data analytics	3.66	0.59	Moderate
Average mean		**3.65**		**Moderate**

It is clear from Table (4-4) that the level of relative importance of the technical skills dimension was moderate, with a general arithmetic mean of 3.65. Statement (7), "The

company's management adequately trains its big data analytics staff" came in first place with an arithmetic average of 3.70 and a high relative importance, while statement (8), "The company's management attracts staff with specialized educational skills in big data analytics" came in last place, with a mean of 3.57, with a moderate relative importance.

3- Management skills

Table (4-5) Means and standard deviations of the sample members' answers on the management skills dimension

No	Statement	Mean	St. Deviation	Relative importance
10	The company's management is able to understand the business needs of its technical managers	3.67	0.61	High
11	The company's management coordinates big data-related activities in ways that support technical managers	3.64	0.59	Moderate
12	The company's management is able to evaluate the outputs resulting from big data	3.68	0.61	High
13	The company's management knows where big data should be applied	3.62	0.66	Moderate
Average mean		**3.65**		**Moderate**

It is clear from Table (4-5) that the level of relative importance of the management skills dimension was moderate, with a general arithmetic mean of 3.65. Statement (12), " The company's management is able to evaluate the outputs resulting from big data" came in first place with an arithmetic average of 3.68 and a high relative importance, while statement (13), " The company's management knows where big data should be applied" was last place with a mean of 3.62 with a moderate relative importance.

4- Organizational learning

Table (4-6) Means and standard deviations of the sample members' answers on the organizational learning dimension

No	Statement	Mean	St. Deviation	Relative importance
14	The company's management is constantly acquiring new knowledge	3.78	0.63	High
15	The company's management makes integrated efforts in exploiting available competencies to explore new knowledge	3.64	0.60	Moderate
16	The company's management has the ability to recognize relevant knowledge	3.65	0.55	Moderate
17	The company's management has the ability to apply relevant knowledge	3.63	0.55	Moderate
Average mean		**3.67**		**High**

It is clear from Table (4-6) that the level of relative importance of the organizational learning dimension was high, with a general arithmetic mean of 3.67. Statement. (14), "The company's management is constantly acquiring new knowledge" was first place, with an arithmetic average of 3.78 and high relative importance, while statement (17), "The company's management has the ability to apply relevant knowledge" came in last place, with a mean of 3.63 with a moderate relative importance.

5- Data driven culture

Table (4-7) Means and standard deviations of the sample members' answers on the Data driven culture dimension

No	Statement	Mean	St. Deviation	Relative importance
18	The company's management makes its decisions based on available data	3.78	0.62	High
19	The company's management tends to go beyond its intuition when data conflicts with the points of view	3.57	0.62	Moderate
20	The company's management constantly trains its employees to make decisions based on data	3.70	0.62	High
Average mean		**3.69**		**High**

It is clear from Table (4-7) that the level of relative importance of the Data driven culture dimension was high, with a general arithmetic mean of 3.69. Statement. (18), "The company's management makes its decisions based on available data" was first place, with an arithmetic

average of 3.78 and high relative importance, while statement (19), "The company's management tends to go beyond its intuition when data conflicts with the points of view" came in last place, with a mean of 3.57, with a moderate relative importance.

4.2.2 Dimensions of the dependent variable (decision making quality)

The arithmetic means and standard deviations of the responses of the participants on the dimensions of decision making quality were extracted, and Table (4-8) shows the results.

Table (4-8) Means and relative importance of the sample members' estimates of the dimensions of the decision making quality

No	Dimension	Mean	Rank	Relative importance
1	Decision making effectiveness	3.68	1	High
2	Decision making efficiency	3.55	2	Moderate
decision making quality as a whole		**3.61**		Moderate

It is clear from Table (4-8) that the relative importance of the dimensions of the decision making quality variable was moderate, as the general arithmetic average was 3.61. The (Decision making effectiveness) dimension came in first place with an arithmetic mean of 3.68 and a high relative importance, while the dimension of (Decision making efficiency) was in last place, with an arithmetic mean of 3.55 and moderate relative importance.

After the averages of the respondents' answers were calculated in relation to the dimensions of the decision making quality as a whole, the averages of the answers were calculated for the statement of each dimension; the results are as follows.

1- Decision making effectiveness

Table (4-9) Means and standard deviations of the sample members' answers on the Decision making effectiveness dimension

No	Statement	Mean	St. Deviation	Relative importance
21	The company's management makes decisions appropriate to its plans	3.69	0.89	High
22	The company's management assures to make decisions that achieve the desired results	3.58	0.71	Moderate
23	The results of the decisions made by the company's management achieve satisfaction among its staff	3.70	0.82	High
24	The decisions made by the company's management develop its organizational performance	3.69	0.74	High
Average mean		**3.68**		High

It is clear from Table (4-9) that the level of relative importance of the (Decision making effectiveness) dimension was high, with a general arithmetic mean of 3.68. Statement (23), "The results of the decisions made by the company's management achieve satisfaction among its staff" came in first place, with an arithmetic average 3.70 and high relative importance, while statement (22), "The company's management assures to make decisions that achieve the desired results" came in last place, with a mean of 3.58 with a moderate relative importance.

2- Decision making efficiency

Table (4-10) Means and standard deviations of the sample members' answers on the Decision making efficiency dimension

No	Statement	Mean	St. Deviation	Relative importance
25	The Decisions made by company's management require relatively low costs	3.42	0.71	Moderate
26	The company's management spends relatively short time in the decision-making process	3.43	0.70	Moderate
27	The company's management involves an appropriate number of individuals in the decision-making process	3.72	0.59	High
28	The company's management makes its decisions at the right time	3.63	0.64	Moderate
Average mean		**3.55**		**Moderate**

It is clear from Table (4-10) that the level of relative importance of the (Decision making efficiency) dimension was moderate, with a general arithmetic mean of 3.55. Statement (27), "The company's management involves an appropriate number of individuals in the decision-making process" came in first place, with an arithmetic average of 3.72 and high relative importance, while statement (25), "The Decisions made by company's management require relatively low costs" came in last place, with a mean of 3.42 and moderate relative importance.

4.3 Hypothesis testing

4.3.1 Main hypothesis testing

H01: There is no impact of big data analytics capability including (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making quality in zain Jordan at ($\alpha \geq 0.05$).

Multiple regression analysis was used to determine the impact of big data analytics capability, with their dimensions (tangible resources, technical skills, management skills, organizational learning and data driven culture), on the decision making quality with its combined dimensions in Zain company, as shown in Table (4-11)

Table (4-11) Multiple regression analysis of the impact of big data analytics capability dimensions on the decision making quality

Dependent Variable	Model Summary		ANOVA			Coefficients					
	R	R^2	f	D.F	Sig f*	Variable	β	SE	B	t	Sig t*
Decision making quality	0.805	0.648	50.874	5	0.000	Tangible resources	0.308	0.188	0.681	3.617	0.000
						technical skills	0.044	0.069	0.276	4.008	0.000
						management skills	0.311	0.064	0.035	0.544	0.587
						organizational learning	-0.041	0.066	0.258	3.896	0.000
						data driven culture	0.338	0.068	-0.035	-0.512	0.610

*Statistically significant at the level of significance of $\alpha \leq 0.05$

The results in Table (4-11) show that the correlation coefficient R = 0.805 indicates a positive and strong relationship between the independent (big data analytics capability) and dependent (decision making quality) variables, and that impact of big data analytics capability dimensions on the dependent variable (decision making quality) is statistically significant, as the calculated F value is 50.874, with a level of significance of Sig = 0.000, which is lower than 0.05. It appears that the value of the coefficient of determination R2=0.648, which indicates that 64.8% of the variance in the decision making quality, can be explained by the variance in the dimensions of big data analytics capability.

The coefficient table shows that the value of β for the Tangible resources dimension was 0.308 and that the value of T was 3.617, with significance level of Sig= 0.00, which indicates that the effect of this dimension is significant, while the value of β in the technical skills dimension was 0.044, and the T-value 4.008, with a significance level of sig = 0.00, which indicates that the effect of this dimension is significant. The value of β in the management skills dimension is 0.311 and its T-value is 0.544, with a significance level of Sig = 0.587, which indicates that the effect of this dimension is insignificant. The value of β in the organizational learning dimension is 0.041 and its T-value is 3.896, with a significance level of Sig = 0.000, which indicates that the effect of this dimension is significant. The value of β in the data driven culture dimension is 0.338 and its T-value is 0.512, with a significance level of Sig = 0.610, which indicates that the effect of this dimension is insignificant

Based on the results, main null hypothesis was rejected and the alternative hypothesis proposing that **There is a statistically significant impact at the significance level ($\alpha \leq 0.05$) of big data analytics capability including (tangible resources, technical skills, management skills, organizational learning and data driven culture) on**

decision making quality.

After the main hypothesis was tested, the sub-hypotheses were tested, as detailed below.

4.3.2 Sub-hypotheses testing

1- H01-1: There is no impact of big data analytics capability including (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making effectiveness in zain Jordan ($\alpha \geq 0.05$).

Table (4-12) Simple regression analysis of the impact of big data analytics capability on decision making effectiveness

Dependent Variable	Model Summary		ANOVA			Coefficients					
decision making effectiveness	**R**	**R^2**	**f**	**D.F**	**Sig f***	**variable**	**β**	**SE**	**B**	**t**	**Sig t***
	0.747	0.558	179.252	1	0.00	big data analytics capability	0.747	0.066	0.880	13.389	0.000

*Statistically significant at the level of significance of $\alpha \leq 0.05$

The results shown in Table (4-12) indicate the value R = 0.747, which means that there is a correlation relationship with its value (74.7%), which is considered high between big data analytics capability and the decision making effectiveness as one of the decision making quality dimensions.

The value of the coefficient of determination is R2 = 0.558, which means that the big data analytics capability explains 55.8% of the variance in the decision making effectiveness. It is also shown in the coefficients table that the value of F was 179.252 at the level of significance of sig = 0.000, which confirms the significance of the regression at the level of $\alpha \leq 0.05$ and at one degree of freedom.

The coefficients table also shows the value of $\beta = 0.747$; that is, a change in one unit in one of the independent variable (big data analytics capability) leads to a change of

74.7% in the (decision making effectiveness), and with a value of T= 13.389 at the level of significance of sig= 0.000, which confirms the significance of the coefficient at the level of $\alpha \leq 0.05$.

Based on the analysis, the first sub-null hypothesis was rejected and the alternative sub-hypothesis was accepted: **There is a statistically significant impact at the significance level (α≤0.05) of big data analytics capability including (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making effectiveness**.

2- H01-2: There is no impact of big data analytics capability including (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making efficiency in zain Jordan ($\alpha \geq 0.05$).

Table (4-13) Simple regression analysis of the impact of big data analytics capability on decision making efficiency

Dependent Variable	Model Summary		ANOVA			Coefficients					
decision making efficiency	R	R^2	f	D. F	Sig f*	variable	β	SE	B	t	Sig t*
	0.533	0.248	56.232	1	0.00	big data analytics capability	0.533	0.091	0.683	7.499	0.000

*Statistically significant at the level of significance of $\alpha \leq 0.05$

The results shown in Table (4-13) indicate the value R = 0.533, which means that there is a correlation relationship with its value (53.3%), which is considered high between big data analytics capability and the decision making efficiency as one of the decision making quality dimensions.

The value of the coefficient of determination is $R^2 = 0.248$, which means that the big data analytics capability explains 24.8% of the variance in the decision making efficiency. It is also shown in the coefficients table that the value of F was 56.232 at the level of

significance of sig = 0.000, which confirms the significance of the regression at the level of $\alpha \leq 0.05$ and at one degree of freedom.

The coefficients table also shows the value of $\beta = 0.533$; that is, a change in one unit in one of the independent variable (big data analytics capability) leads to a change of 53.3% in the (decision making efficiency), and with a value of T= 7.499 at the level of significance of sig= 0.000, which confirms the significance of the coefficient at the level of $\alpha \leq 0.05$.

Based on the analysis, the second sub-null hypothesis was rejected and the alternative sub-hypothesis was accepted: **There is a statistically significant impact at the significance level ($\alpha \leq 0.05$) of big data analytics capability including (tangible resources, technical skills, management skills, organizational learning and data driven culture) on decision making efficiency**.

Chapter five

Results Discussing

In this chapter, the results were discussed in light of what resulted from the statistical analysis process of the sample members' answers to the study variables items, with the aim of identifying The Impact of Big Data Analytics Capability on Decision Making Quality: A Case Study on Zain Telecommunication Company in Jordan.

5.1 Discussing the results of the analysis of the study's dimensions and the relative importance of the study variables

5.1.1 Discuss the dimensions of (Big data analytics capability)

The results of the study indicated that the relative importance of the independent variable "Big data analytics capability" and its combined dimensions was moderate. The (Data driven culture) dimension came in first place with a high relative importance, followed by the (Organizational learning) dimension with a high relative importance, followed by the (Tangible resources) dimension with a high relative importance. Medium relative importance, followed by the (Management skills) dimension, while the (Technical skills) dimension came in last place with a medium relative importance. This indicates that the level of big data analytics capability in the Zain telecommunication company was moderate.

The result of the high relative importance of the (Data driven culture) dimension indicates that Zain Company is aware of the importance of making its decisions based on the data available to it, exceeding its intuition when the available data conflicts with viewpoints, in addition to constantly training its employee management to make decisions based on data. available to it.

The result of the high relative importance of the (organizational learning) dimension also indicates that Zain Telecommunication seeks to acquire new knowledge continuously, and that it is making integrated efforts in exploiting the available competencies to explore new knowledge, which enables it to realize and apply relevant knowledge.

The researcher attributes this result to the fact that implementing a culture of data reliance at Zain Telecommunication Company represents a fundamental foundation for developing the ability to analyze big data. This contributes to making better decisions through a deep understanding of customer needs and preferences. Thanks to data analysis, the company can improve customer experience, integrate this into service improvement strategies and provide personalized services.

Enhancing process efficiency is also a natural outcome of applying big data analysis, as company operations can be improved and a balance between efficiency and cost can be achieved. In addition, data analysis allows the company to monitor market trends and adjust marketing strategies effectively, which enhances communication with customers and achieves more positive interaction.

Implementing a data-driven culture contributes to enhancing innovation and stimulating development processes within the company, as data analysis can improve security strategies and ensure the provision of sufficient capacity to meet market aspirations. These three aspects - making better decisions, improving process efficiency, and fostering innovation - come together to enhance the company's ability to compete and achieve sustainable success in the telecommunications industry.

This result agreed with the result of Hammad’s study (2021), whose results showed that there is strength in the dimensions of big data applications, represented by knowledge

of tools for organizing big data applications, senior management support for using big data applications, availability of expertise in dealing with big data applications, and availability of infrastructure for applications. Big data, as agreed with the result of Al-Sheti's study (2021), whose results showed the availability of an integrated infrastructure for information and communications technologies, and an integrated database that includes all departments at a high level.

The result of the current study differed from the result of the Eid study (2021), which showed that there was a weakness in the financial and human capabilities to manage big data at the National Bank of Egypt. This difference may be attributed to the difference in the environment between this study and the current study, in addition to the study sample, as the current study was conducted on Zain Telecommunications Company in Jordan, while the previous study was conducted on a bank in Egypt.

5.1.2 Discuss the dimensions of (decision making quality)

The results showed that the relative importance of the dependent variable "decision making quality" was moderate. The "Decision making effectiveness" dimension ranked first with a high relative importance, followed by the "Decision making efficiency" dimension with a medium relative importance. This result indicates that the company's management is making decisions appropriate to its plans. It is keen to make decisions that achieve the desired results, and it also seeks to develop the decisions it makes so that the results of the decisions achieve satisfaction among its cadres.

The researcher explains the increase in the "Decision Making Effectiveness" dimension to the fact that Zain's management in Jordan follows the stages of the decision-making process, as it works to accurately identify the basic problems of the telecommunications sector and their dimensions according to their importance, nature,

and size, and is also keen to provide all information related to the alternatives in terms of advantages. And the disadvantages, costs, contribution of each alternative, degree of risk and expected benefit, and evaluates the alternatives based on the suitability of each alternative with the external environmental factors in the telecommunications sector, to choose the alternative that is compatible with the importance of the organization, its goals, values, systems and procedures, and then determines the material and human capabilities to implement the decision, and investigates accuracy and realism. In the analysis during the decision implementation process.

5.2 Discussing the results of the analysis of study hypotheses

The results related to testing the main study hypothesis showed that there is a statistically significant effect of the variable (big data analytics capability) with its dimensions (Tangible resources - technical skills - management skills - organizational learning - data driven culture) on (decision making quality) with its combined dimensions (decision making effectiveness). – decision making efficiency) in the Jordanian company Zain. Which provides a good explanation for the variation in decision making quality with its combined dimensions of big data analytics capability.

The results of the hypotheses branching from the main hypothesis also showed the presence of a statistically significant effect of big data analytics capability on decision making effectiveness, and the presence of a statistically significant effect of big data analytics capability on decision making efficiency.

The study explains this result that big data analytics capability supports the decision-making process and provides sufficient understanding for the manager to make decisions by collecting, analyzing, and synthesizing the necessary data. Big data analysis gives the decision-maker an opportunity to achieve the organization’s vision, and this often refers

to information and knowledge, which is important for the process. Decision making. Big data analysis also plays an important role in supporting the decision-making process, guiding administrators to the future risks surrounding the organization, and identifying opportunities available for organizations to seize.

The study also attributes this result to the fact that analyzing big data allows the company to better understand customer behavior patterns and needs, and thanks to this analysis, decisions can be directed more accurately and based on strong foundations, which contributes to improving the quality of the decisions made. In addition, thanks to data analysis, it becomes possible to predict market trends and identify future opportunities and challenges. This allows the company to optimize its strategies and make informed decisions based on a future vision of the industry. The company's ability to effectively analyze data enhances innovation and development processes. Data can be used to identify new opportunities and improve internal processes, contributing to the development of new products and services.

This result agreed with the study of Al-Zubaidi and Al-Zayadi (2023), whose results showed that the ability to analyze big data directly affects organizational flexibility and organizational performance, and it also agreed with the study of Al-Ajmi et al. (2022), whose results indicated that there is an effect of the data awareness variable at the level of The use of big data and the variable of decision-making at the individual level. An effect of the variable of use of big data on decision-making was also found.

The result of the current study agreed with the study of Eid (2021), which showed the existence of a significant relationship. Statistics between the dimensions of big data management and the effectiveness of administrative decisions.

5.3 Conclusion

According to the study methodology and results, the researcher concluded that there is a statistical significance Impact of Big Data Analytics Capability on Decision Making Quality in Zain Telecommunication Company in Jordan. Also, the results of analyzing the questionnaire answers showed that there is a moderate level of capability to analyze big data and the quality of decision making in Zain Telecommunication Company in Jordan.

5.4 Recommendations

Based on the results reached in this study, the researcher put forward a set of recommendations for zain telecommunication company in Jordan, which are as follows:

1- Enhancing the tangible resources by providing more access to unstructured data to analyze it and adopting new forms of databases. Also, more consideration of adopting open source software for big data analytics.

2- Attracting staff with more specialized educational skills in big data analytics and conducting training courses and workshops for employees to enhance big data analysis technical skills and enhancing convenient environment to develop their skills.

3- Encouraging the use of big data in making strategic and tactical decisions, and developing decision-making processes based on accurate and solid foundations.

4- Ensuring that the managerial staff knows where the big data should be applied and coordinates big data-related activities in ways that support technical managers.

5- Allocate more resources to develop the data analysis structure within the company and invest in advanced technological tools to improve data analysis capabilities that leads to improving decision making process.

6- Conduct additional studies in the future that are related to the analytics capability of big data and to improve the quality of decision making process to keep pace with developments in resources.

References

Abdullah, Shehyar Zubair (2018). The impact of strategic intelligence on the quality of strategic decisions in private universities in the northern region of Jordan, *unpublished master's thesis*, Mu'tah: Al al-Bayt University.

Acharjya, D. P., & Kauser, A. P. (2016). A survey on big data analytics: challenges, open research issues and tools. *International Journal of Advanced Computer Science and Applications*, *7*(2).

Aishoush, Muhammad Al-Hafiz (2018). The impact of information systems efficiency on decision-making: A field econometric study for the Saidal complex during the period 2015-2016, *Journal of Advanced Economic Research*, (4), 70-89.

Ajayi, V. O. (2017). Primary sources of data and secondary sources of data. *Benue State University*, *1*(1), 1-6.

Al-Ajmi, Muhammad Ali Abdullah, Al-Fadhli, Mishal Shehab, Al-Otaibi, and Jamila Hamdan. (2022). The impact of big data and some of its variables on decision-making during the period of the spread of the Covid-19 pandemic from the perspective of students at the College of Basic Education in the State of Kuwait. *Journal of Educational Studies and Research*, 2(5), 430-450.

Al-Aklabi, Ali. (2018). The importance of big data analysis in decision-making at King Saud University: An evaluation study of the Itqan system, *Journal of Information and Technology Studies*, 2(15), 2-12.

Al-Bakhit, Haitham Mufleh (2020). *The impact of strategic intelligence on decision-making in Islamic banks in Jordan*, [Unpublished master's thesis], Al-Bayt University, Amman, Jordan.

Al-Bar, Adnan; Al-Dosari, Hammoud. (2019) Big Data Concepts and Applications. King Fahad National Library.

Al-Ghosni, Sauvenage Khaled and Al-Saiti, Fathi Saad (2018). The impact of work pressures on the decision-making process, *Libyan International Journal*, (39), 1-20.

Al-Ghubairi, Muhammad; And Hassan, Abdul Rahman. (2019). Big data and its impact on achieving the Kingdom of Saudi Arabia's Vision 2030: An applied study, *Journal of Strategy and Development*, 9(3),

Alkatheeri, Y., Ameen, A., Isaac, O., Nusari, M., Duraisamy, B., & Khalifa, G. S. (2020). The effect of big data on the quality of decision-making in Abu Dhabi Government organisations. In *Data management, analytics and innovation* (pp. 231-248). Springer, Singapore.

AL-Ma'aitah, M. A. (2020). Utilizing of big data and predictive analytics capability in crisis management. *J. Comput. Sci*, *16*(3), 295-304.

Alqahtani, A. A. (2023). Mining in big data and its impact on decision-making from the point of view of managers and heads of departments of administrative units in the Ministry of Health in the Kingdom of Saudi Arabia. Journal of Economic, Administrative and Legal Sciences, 7(5), 76 – 98.

Al-Saati, F. Z. A., Al-Areifi, H. M., Al-Suwailem, B. S., Al-Mehaidib, A. K., Al-Amari, M. T., & Samha, A. K. The Impact of Accounting Information Technology on the Effectiveness of Decision-Making.

Al-Sarsak, Hashem Salah (2020). *The impact of strategic intelligence in enhancing the quality of decisions in the Palestinian Ministry of Interior and National Security*, unpublished doctoral thesis, Gaza: Al-Aqsa University.

Alshammari, A. A. (2020). The impact of human resource management practices, organizational learning, organizational culture and knowledge management capabilities on organizational performance in Saudi organizations: a conceptual framework. *Revista Argentina de Clínica Psicológica*, *29*(4), 714.

Al-Sheti, Enas. (2021). Big data analytics in Saudi banks: their reality and the level of their use in supporting financing decisions, Alexandria University *Journal of Administrative Sciences*, 58 (3), 189-230.

Al-Zubaidi, Diaa Mahrous, and Al-Zayadi, Abdel-Azim Drifesh Jabbar. (2023). Exploring the relationship between big data analyzability and organizational performance: The mediating role of organizational flexibility: Analysis research in Iraqi telecommunications companies. *Journal of Sustainable Studies*, 5(3), 738-776.

Awad, Haitham Talaat (2021). Administrative communication and its impact on the effectiveness of the decision-making process: an applied study at Shendi University, *Al-Qalzam Journal of Economic and Social Studies*, (3), 101-122.

Awan, U., Shamim, S., Khan, Z., Zia, N. U., Shariq, S. M., & Khan, M. N. (2021). Big data analytics capability and decision-making: The role of data-driven insight on circular economy performance. *Technological Forecasting and Social Change*, *168*, 120766.

Ayokanmbi, F. M. (2021). The impact of big data analytics on decision-making. *International Journal of Management IT and Engineering*, *11*(4), 1-5.

Bahrami, M., Shokouhyar, S., & Seifian, A. (2022). Big data analytics capability and supply chain performance: the mediating roles of supply chain resilience and innovation. *Modern Supply Chain Research and Applications*, 4(1), 62-84.

Batayneh, Tharwat Saleh (2020). *The impact of strategic intelligence on decision-making methods in the Jordanian government sector*, [Unpublished master's thesis], Yarmouk University, Jordan, Irbid.

Bateman, I. J., & Mace, G. M. (2020). The natural capital framework for sustainably efficient and equitable decision making. *Nature Sustainability*, *3*(10), 776-783.

Bazerman, M. H. (2016). The Power of Noticing: What the Best Leaders See. Simon & Schuster.

Berndtsson, M., Forsberg, D., Stein, D., & Svahn, T. (2018). Becoming a data-driven organisation. In *26th European Conference on Information Systems (ECIS2018), Portsmouth, United Kingdom, June 23-28, 2018*.

Burton, J. W., Stein, M. K., & Jensen, T. B. (2020). A systematic review of algorithm aversion in augmented decision making. Journal of behavioral decision making, 33(2), 220-239.

Cao, G., & Duan, Y. (2014). Gaining competitive advantage from analytics through the mediation of decision-making effectiveness: an empirical study of UK manufacturing companies.

Cao, G., Duan, Y., & Cadden, T. (2019). The link between information processing capability and competitive advantage mediated through decision-making effectiveness. *International Journal of Information Management*, *44*, 121-131.

Cao, G., Duan, Y., Edwards, J. S., & Dwivedi, Y. K. (2021). Understanding managers' attitudes and behavioral intentions towards using artificial intelligence for organizational decision-making. Technovation.

Caracciolo, F., Furno, M., D'Amico, M., Califano, G., & Di Vita, G. (2022). Variety seeking behavior in the wine domain: A consumers segmentation using big data. *Food Quality and Preference*, *97*, 104481.

Cerda, A. A. & García, L. Y. (2021). Hesitation and refusal factors in individuals' decision-making processes regarding a coronavirus disease 2019 vaccination. Frontiers in public health. frontiersin.org

Chatterjee, S., Chaudhuri, R., & Vrontis, D. (2021). Does data-driven culture impact innovation and performance of a firm? An empirical examination. *Annals of Operations Research*, 1-26.

Chatterjee, S., Chaudhuri, R., Gupta, S., Sivarajah, U., & Bag, S. (2023). Assessing the impact of big data analytics on decision-making processes, forecasting, and performance of a firm. *Technological Forecasting and Social Change*, *196*, 122824.

Dane, E., Rockmann, K. W., & Pratt, M. G. (2012). When should I trust my gut? Linking domain expertise to intuitive decision-making effectiveness. *Organizational behavior and human decision processes*, *119*(2), 187-194.

Darvazeh, S. S., Vanani, I. R., & Musolu, F. M. (2020). Big data analytics and its applications in supply chain management. *New Trends in the Use of Artificial Intelligence for the Industry*, 4, 175.

Doboli, A., Curiac, D., Pescaru, D., Doboli, S., Tang, W., Volosencu, C., ... & Istin, C. (2018). Cities of the future: Employing wireless sensor networks for efficient decision making in complex environments. *arXiv preprint arXiv:1808.01169*.

Dubey, R., Gunasekaran, A., Childe, S. J., Luo, Z., Wamba, S. F., Roubaud, D., & Foropon, C. (2018). Examining the role of big data and predictive analytics on collaborative performance in context to sustainable consumption and production behaviour. *Journal of Cleaner Production*, *196*, 1508-1521.

Eid, Samah Farag Muhammad. (2021). The impact of big data management on the effectiveness of administrative decisions: an applied study on the National Bank of Egypt. *Scientific Journal of Business and Environmental Studies*, 12(4), 778 – 806.

Ejimabo, N. O. (2015). An approach to understanding leadership decision making in organization. *European Scientific Journal*, *11*(11).

El-ata, A., & Salah, G. M. (2023). Impact of Organizational Learning on Dynamic Capabilities with Application on Egyptian Public Sector Pharmaceutical Companies.

Elgendy, N., & Elragal, A. (2014, July). Big data analytics: a literature review paper. In *Industrial conference on data mining* (pp. 214-227). Springer, cham.

Fikri, Muhammad Fikri and Shadi, Adel Imam (2020). The impact of knowledge management processes on decision making: A field study on the hotel sector in Greater Cairo, *Journal of Trade and Finance*, (1), 114-140.

Flake, J. K., Davidson, I. J., Wong, O., & Pek, J. (2022). Construct validity and the validity of replication studies: A systematic review. *American Psychologist*, *77*(4), 576.

Galles, J., Lenz, J., Peterson, G., & Sampson, J. (2019). Mindfulness and decision-making style: Predicting career thoughts and vocational identity. *Career Development Quarterly*, *67*(1), 77-91.

Gandomi, A., & Haider, M. (2015). Beyond the hype: Big data concepts, methods, and analytics. *International Journal of Information Management*, 35(2), 137-144.

Gopal, P. R. C., Rana, N. P., Krishna, T. V., & Ramkumar, M. (2022). Impact of big data analytics on supply chain performance: an analysis of influencing factors. *Annals of Operations Research*, 1-29.

Grant, A. M. (2021). Think Again: The Power of Knowing What You Don't Know. Viking.

Guion, R. M. (1980). On Trinitarian doctrines of validity. *Professional psychology*, *11*(3), 385.

Gunasekaran, A., Papadopoulos, T., Dubey, R., Wamba, S. F., Childe, S. J., Hazen, B., & Akter, S. (2017). Big data and predictive analytics for supply chain and organizational performance. *Journal of Business Research*, *70*, 308-317.

Gupta, M., & George, J. F. (2016). Toward the development of a big data analytics capability. *Information & Management*, *53*(8), 1049-1064.

Gupta, R., & Sharma, S. (2023). Leveraging Big Data for Supply Chain Optimization. *International Journal of Logistics Management*, 40(3), 315-328.

Hair, J.F., Hult, G.T.M., Ringle, C.M. and Sarstedt, M. (2017a). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage, Thousand Oaks, CA.

Hammad, Muhammad Muhammad. (2021). The impact of big data applications on improving human resources management practices: a field study on international information technology companies in Egypt. *Scientific Journal of Business and Environmental Studies*, 12(1), 150-190.

Heath, C., & Heath, D. (2020). Upstream: The Quest to Solve Problems Before They Happen. Avid Reader Press / Simon & Schuster.

Hecklau, F., Galeitzke, M., Flachs, S., & Kohl, H. (2016). Holistic approach for human resource management in Industry 4.0. *Procedia Cirp*, *54*, 1-6.

Hwang, K. & Chen, M. (2017). Big Data Analytics For Cloud, IoT and Cognitive Learning. John Wiley & Sons Ltd.

Hyypiä, M. (2022). Strengthening the effectiveness of organizational coaching service.

Jaiswal, A., Arun, C. J., & Varma, A. (2022). Rebooting employees: Upskilling for artificial intelligence in multinational corporations. The International Journal of Human Resource Management, 33(6), 1179-1208.

Janssen, M., van der Voort, H., & Wahyudi, A. (2017). Factors influencing big data decision-making quality. *Journal of business research*, *70*, 338-345.

Jeble, S., Dubey, R., Childe, S. J., Papadopoulos, T., Roubaud, D., & Prakash, A. (2018). Impact of big data and predictive analytics capability on supply chain sustainability. *The International Journal of Logistics Management*.

Kerrin, M., Mamabolo, M. A., & Kele, T. (2017). Entrepreneurship management skills requirements in an emerging economy: A South African outlook. *The Southern African Journal of Entrepreneurship and Small Business Management*, *9*(1), 1-10.

Kou, G., Yang, P., Peng, Y., Xiao, F., Chen, Y., & Alsaadi, F. E. (2020). Evaluation of feature selection methods for text classification with small datasets using multiple criteria decision-making methods. Applied Soft Computing, 86, 105836.

Kumar, V., & Garg, M. L. (2018). Predictive analytics: a review of trends and techniques. *International Journal of Computer Applications*, *182*(1), 31-37.

Lansing, J., Benlian, A., & Sunyaev, A. (2018). "Unblackboxing" Decision Makers' Interpretations of IS Certifications in the Context of Cloud Service Certifications. *Journal of the Association for Information Systems*, *19*(11), 3.

Larrick, R. P. (2012). Broaden the decision frame to make effective decisions. *Handbook of principles of organizational behavior: indispensable knowledge for evidence-based management*, 461-480.

Levitt, S. D., & Dubner, S. J. (2021). Think Like a Freak: The Authors of Freakonomics Offer to Retrain Your Brain. William Morrow Paperbacks.

López-Cabrales, Á., Real, J. C., & Valle, R. (2011). Relationships between human resource management practices and organizational learning capability: The mediating role of human capital. *Personnel Review*.

Mazurchenko, A., & Maršíková, K. (2019). Digitally-powered human resource management: Skills and roles in the digital era. *Acta Informatica Pragensia*, *8*(2), 72-87.

Mikalef, P., Boura, M., Lekakos, G., & Krogstie, J. (2019). Big data analytics capabilities and innovation: the mediating role of dynamic capabilities and moderating effect of the environment. *British Journal of Management*, *30*(2), 272-298.

Monino, J. L., & Sedkaoui, S. (2016). *Big data, open data and data development* (Vol. 3). John Wiley & Sons.

Nasir, A. N. M., Ali, D. F., Noordin, M. K. B., & Nordin, M. S. B. (2011, January). Technical skills and non-technical skills: predefinition concept. In *Proceedings of the IETEC'11 Conference, Kuala Lumpur, Malaysia* (pp. 01-p17).

Nekoranec, J. (2013). Managerial skills development as an integral part of managerial competence. *Scientific Research & Education in the Air Force-AFASES, 149, 54*.

Obaid, Muhannad, and Al-Sheikhli, Abdul Razzaq (2015). The impact of strategic intelligence on decision-making methods: a field research analysis in the Ministry of Construction and Housing, *Journal of Economics and Administrative Sciences*, 21(8), 1-23.

Oncioiu, I., Bunget, O. C., Türkeș, M. C., Căpușneanu, S., Topor, D. I., Tamaș, A. S., ... & Hint, M. Ș. (2019). The impact of big data analytics on company performance in supply chain management. *Sustainability*, *11*(18), 4864.

Orth, R., Scheumann, R., Galeitzke, M., Wolf, K., Kohl, H., & Finkbeiner, M. (2015). Sustainable corporate development measured by intangible and tangible resources as well as targeted by safeguard subjects. *Procedia Cirp*, *26*, 630-634.

Othman, Muzamil (2017). Testing the impact of elements of strategic intelligence on the effectiveness of decision-making: a case study of the Al-Sharq Press and Publishing Foundation, *Arab Journal of Science and Research Publishing*, 1 (1), 165-181.

Parra, X., Tort-Martorell, X., Alvarez-Gomez, F., & Ruiz-Viñals, C. (2023). Chronological evolution of the information-driven decision-making process (1950–2020). Journal of the Knowledge Economy, 14(3), 2363-2394.

Popescu, L., Iancu, A., Avram, M., Avram, D., & Popescu, V. (2020). The role of managerial skills in the sustainable development of SMEs in Mehedinti County, Romania. *Sustainability*, *12*(3), 1119.

Raman, S., Patwa, N., Niranjan, I., Ranjan, U., Moorthy, K., & Mehta, A. (2018). Impact of big data on supply chain management. *International Journal of Logistics Research and Applications*, 21(6), 579-596.

Romualdez, A. M., Walker, Z., & Remington, A. (2021). Autistic adults' experiences of diagnostic disclosure in the workplace: Decision-making and factors associated with outcomes. Autism & Developmental Language Impairments, 6, 23969415211022955.

Salleh, K. M., & Sulaiman, N. L. (2015). Technical skills evaluation based on competency model for human resources development in technical and vocational education. *Asian Social Science*, *11*(16), 74.

Sarkar, A., Panja, S. C., Das, D., & Sarkar, B. (2015). Developing an efficient decision support system for non-traditional machine selection: an application of MOORA and MOOSRA. *Production & Manufacturing Research*, *3*(1), 324-342.

Schriber, S., & Löwstedt, J. (2015). Tangible resources and the development of organizational capabilities. *Scandinavian Journal of Management*, *31*(1), 54-68.

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*. john wiley & sons.

Shamim, S., Zeng, J., Shariq, S. M., & Khan, Z. (2019). Role of big data management in enhancing big data decision-making capability and quality among Chinese firms: A dynamic capabilities view. *Information & Management*, *56*(6), 103135.

Sheng, J., Amankwah-Amoah, J., Khan, Z., & Wang, X. (2021). COVID-19 pandemic in the new era of big data analytics: Methodological innovations and future research directions. *British Journal of Management*, *32*(4), 1164-1183.

Soltwisch, B., & Krahnke, K. (2017). Maximizing decision making style and managerial effectiveness: Understanding how maximizing and focus of control impact managers' performance on the job. *Managing Global Transitions*, *15*(3), 215-230.

Storm, M., & Borgman, H. (2020, January). Understanding challenges and success factors in creating a data-driven culture. In *Proceedings of the 53rd Hawaii International Conference on System Sciences*.

Torres-Barreto, M. L., Alvarez-Melgarejo, M., & Montealegre, F. (2020). Relationship between the tangible resources of companies and their capability of knowledge absorption. *Espacios*, *41*(17), 23-23.

Tushman, M. L., & Anderson, P. (2018). Technological discontinuities and organizational environments. In *Organizational Innovation* (pp. 345-372). Routledge.

Vakilipour, S., Sadeghi-Niaraki, A., Ghodousi, M., & Choi, S. M. (2021). Comparison between multi-criteria decision-making methods and evaluating the quality of life at different spatial levels. Sustainability.

Van Minh, N., Badir, Y. F., Quang, N. N., & Afsar, B. (2017). The impact of leaders' technical competence on employees' innovation and learning. *Journal of Engineering and Technology Management*, *44*, 44-57.

Vardarlier, P. & Silahtaroglu, G. (2016). Gossip Management at Universities using Big Data Warehouse Model Integrated with a Decision Support System.*Journal of Research in Business & Social Science*, 5(1), 1-14.

Wang, Y., & Byrd, T. A. (2017). Business analytics-enabled decision-making effectiveness through knowledge absorptive capacity in health care. *Journal of Knowledge Management*.

Wang, Y., Kung, L., & Byrd, T. A. (2018). Big data analytics: Understanding its capabilities and potential benefits for healthcare organizations. *Technological forecasting and social change*, *126*, 3-13.

Wills, K. S. (2022). *An Examination of Team Humility on the Decision-Making Quality of High-Level Strategic Teams: A Moderated Mediation Study* (Doctoral dissertation, Eastern University).

Wongwilai, S., Putnuan, S., Banyongpisut, A., Choopak, W., Sutikasana, C., Wongcharoensin, K., ... & Jermsittiparsert, K. (2022). The influence of tangible resources and operational performance to promote financial performance of electronic industry. *Uncertain Supply Chain Management*, *10*(2), 315-324.

Yaqoob, I., Hashem, I. A. T., Gani, A., Mokhtar, S., Ahmed, E., Anuar, N. B., & Vasilakos, A. V. (2016). Big data: From beginning to future. *International Journal of Information Management*, *36*(6), 1231-1247.

Appendices

Appendix (1) The questionnaire in its final form

جـامـعـة الـشـرق الأوسـط
MIDDLE EAST UNIVERSITY
Amman - Jordan

The researcher is conducting a study entitled “The Impact of Big Data Analytics on the Quality of Decision-Making: A Case Study in the Jordanian Telecommunications Company Zain.” It is part of the requirements for the Master of Business Administration degree.

Given your experience and knowledge, the researcher addresses you, requesting that you answer the questionnaire paragraphs.

researcher
Samer Sami Monem Basal

Part one: Demographic characteristics

(1) Gender

Female	☐	Male	☐

(2)Educational level

High Diploma	☐	Bachelor's	☐
PhD	☐	Master's	☐

(3)Age

30 – less than 35 years	☐	Younger than 30 years	☐
40 years and above	☐	35 – less than 40 years	☐

(4)Years of experience

5 – less than 10 years	☐	Less than 5 years	☐
15 years and above	☐	10 – less than 15 years	☐

5)Management level

Middle - level management	☐	Top - level management	☐
		First - level management	☐

Part two (independent variables): Big data analytics capability

No.	Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Tangible resources						
1	The company's management provides sufficient funding for its big data analytics projects					
2	The company's management provides access to the unstructured big data					
3	The company's management integrates data from multiple sources into its data storage.					
4	The company's management adopts new forms of databases					
5	The company's management adopts an open source software for big data analytics					
Technical skills						
6	The company's management provides technical staff with appropriate skills in big data analytics					
7	The company's management adequately trains its big data analytics staff					
8	The company's management attracts staff with specialized educational skills in big data analytics					
9	The company's management provides a convenient environment to develop the skills of its staff in big data analytics					
Management skills						
10	The company's management is able to understand the business needs of its technical managers					
11	The company's management coordinates big data-related activities in ways that support technical managers					
12	The company's management is able to evaluate the outputs resulting from big data					
13	The company's management knows where big data should be applied					

Organizational learning						
14	The company's management is constantly acquiring new knowledge					
15	The company's management makes integrated efforts in exploiting available competencies to explore new knowledge					
16	The company's management has the ability to recognize relevant knowledge					
17	The company's management has the ability to apply relevant knowledge					
Data driven culture						
18	The company's management makes its decisions based on available data.					
19	The company's management tends to go beyond its intuition when data conflicts with the points of view					
20	The company's management constantly trains its employees to make decisions based on data					

Part three (dependent variable): decision making quality

No.	Item	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Decision making effectiveness						
21	The company's management makes decisions appropriate to its plans					
22	The company's management assures to make decisions that achieve the desired results					
23	The results of the decisions made by the company's management achieve satisfaction among its staff					
24	The decisions made by the company's management develop its organizational performance					
Decision making efficiency						
25	The Decisions made by company’s management require relatively low costs					
26	The company’s management spends relatively short time in the decision-making process					
27	The company's management involves an appropriate number of individuals in the decision-making process					
28	The company's management makes its decisions at the right time					

Appendix (2) Panel of Referees Committee

#	Name	University
1	Prof. Ahmad Ali Salih	Middle East University
2	Prof. Abdalaziz Sharabati	Middle East University
3	Prof. Ahmad Alghandor	Middle East University
4	Dr. Husam Yaseen	Middle East University

#	Name	Profession
1	Mohammad Enaya	Quality Assurance and Business Support Team Leader – IT Department in Zain Jordan
2	Tareq Saleh	Quality Assurance and Automation Manager – IT Department in Zain Jordan

Appendix (3) Zain Company approval

zain

التاريخ:**06/12/2023**
كتاب رقم: **HRD-ZY-2023-189**

السادة جامعة الشرق الأوسط المحترمين،

تحيه طيبه وبعد،

نود أن نشير بالموافقة على توزيع استبانة الطالب **سامر سامي يصل** في الشركة الأردنية لخدمات الهواتف المتنقلة "زين".

وتفضلوا بقبول فائق الاحترام،

قسم الاتصال والتدريب

الشركة الأردنية لخدمات الهواتف المتنقلة

ZY

Telephone: +962 79 7000900
P.O Box: 940821 Amman- 111194- Jordan Mobile:

+962 79 5797979 Fax: +962

79 8510620 E-mail:

info@jo.zain.com www.zain.com