INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 13, Issue 5, (2023) E-ISSN: 2222-6990

Information Security as a Mediating Variable between Business Intelligence and Decision-Making at Jordanian Commercial Banks

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To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v13-i5/16875 DOI:10.6007/IJARBSS/v13-i5/16875

Published Date: *16* May 2023

Abstract

This study investigates the impact of business intelligence with its dimensions, including, data resources, data storage, data processing and analysis, data presentation, and business performance management on decision-making with its dimensions, (diagnosing problem, developing alternatives, evaluating alternatives, selecting the best alternative, decision implement and follow-up). It further investigates the mediating role in improving this effect as information security mediator at Jordanian commercial banks. The sample study representing the study community (population) numbering 375 from top-management and middle management at Jordanian commercial banks consisted of 191. The study distributes (230) questionnaires as a precaution, while (223) of them are retrieved and valid for statistical analysis. The findings reveal that the relationship between the business intelligence with its dimensions and decision-making amounts to (β= 0.634). The results show that T-Value= (12.670) at the significance level (Sig= 0.000). It confirms that the relationship between business intelligence with its dimensions and decision-making with its dimensions is significant. Interestingly, the findings indicate that business intelligence with its dimensions have explained an amount of (63.4%) of variance in the decision-making at the Jordanian commercial banks. The study concludes that there is a direct normative effect of the business intelligence with its dimensions in the decision-making in the Jordanian commercial banks reached to (0.634). As for the direct normative effect of the business intelligence with its dimensions in the information security reached to (0.594). Besides, the direct normative effect of the information security in decision-making accounts for (0.225) and all of them are significant. Hence, the indirect normative effect for the information security between business intelligence and decision-making accounts for (0.134). The overall normative effect between the business intelligence with its dimensions and decision-making with its dimensions at Jordanian commercial banks amount to (0.767). Thus, it can be argued that business intelligence with its dimensions has been able to explain (63.4%) of variance in decision making, while information technology has been able to explain (13.4%) of that

variance. Thus, the overall explanation of the modal by the existence of the mediating variable (information security) accounts for (76.7%) of variance in decision making with its dimensions at Jordanian commercial banks.

Keywords: Business Intelligence, Decision Making, Information Security, Commercial Jordanian Banks.

Introduction

Every organization seeks to the optimal use of information in terms of making its decisions effectively, using administrative methods, techniques, and systems to keep pace with all changes. One of the latest and most important systems is business intelligence, which has become increasingly important in the management and economy in the business organizations. Moreover, the importance of business intelligence is manifested in its association and interaction with fields of knowledge. Business intelligence is resulted from technological development, and it relies on information systems on organizations.

Business intelligence is the hard core through which small and large business are developed. It contributes significantly to the development of new mechanisms of actions that work on reducing the mistakes by making the right decisions that drive the organizations to take advantage of the opportunities in the field of organization's environment that requires rapid and precise access to information.

Information security plays a pivotal role in providing protection system, data, and information circulating from fraud, storage, playing with, or missing. Owing to the rapid technological development, it becomes easy to exchange data and information that might be vulnerable to penetration. So, it becomes essential for organizations to protect the data and information using various methods of protection such as the essential programs and applications.

The Importance of the Study

Theoretical Importance: The scientific significance of this study is manifested in investigating subjects of business intelligence with its dimensions; including, (data sources, data processing and analysis, data presentation, and business performance management and making decisions; including, (diagnosing a problem, developing alternatives, evaluating alternatives, selecting the best alternative, decision implement and follow-up) and information security. These topics are renewed due to the massive technological development and the dire need to data , information and the business intelligence to collect the essential data that highly benefit and help the organizations in making informed decisions and building on a good base of information provided by business intelligence that help in improving the quality of administrative performance and making decisions in a manner that improves the capacities of the Jordanian commercial banks in an effective manner.

Practical Importance: The practical significance is manifested in the research environment in which this study was conducted and the possibility of the Jordanian commercial banks to take advantage of the findings emanated from the study in terms of decision-making concept, business intelligence practices concept, and information security at Jordanian commercial banks.

Objectives of the Study

1. The study seeks primarily to investigate the mediating role of information security on improving the impact of business intelligence on decision-making at Jordanian commercial banks, which includes the following:

2. Identifying the level of materiality of business intelligence, decision-making, and information security at Jordanian commercial banks.
3. Investigating the impact of business intelligence on decision-making at Jordanian commercial banks.
4. Identifying the impact of information security on improving the relationship among the business intelligence with its dimensions on decision-making at Jordanian commercial banks.

Statement of the Problem

The problem of this study lies in decision-making at Jordanian commercial banks and identifying their abilities in making their decisions and achieving their goals. Therefore, the study investigated the most important and effective factors on decision-making. To this end, the applicability of business intelligence on the quality of decision-making was the first option from the researchers' perspectives, and the ability of Jordanian commercial banks to modify this impact.

Hypotheses of the Study

$H_0$1: "There is not statistically significance effect at the significance level (α≤0.05) for the business intelligence with its dimensions, namely, (data sources, data storage, data processing and analysis, data presentation, and business performance management) on decision making with its dimensions; including, (diagnosing problem, developing alternatives, evaluating alternatives, selecting the best alternatives, decision implement and follow-up) at Jordanian commercial banks".

$H_0$2: "There is not statistically significant effect at the significance level (α≤0.05) for business intelligence with its dimensions (data sources, data storage, data processing and analysis, data presentation, business performance management) on decision making with its dimensions (diagnosing problems, developing alternatives, evaluating alternatives, selecting the best alternative, decision implement and follow-up) in the existence information security at Jordanian commercial banks".

Figure No. (1) Shows Study Model.

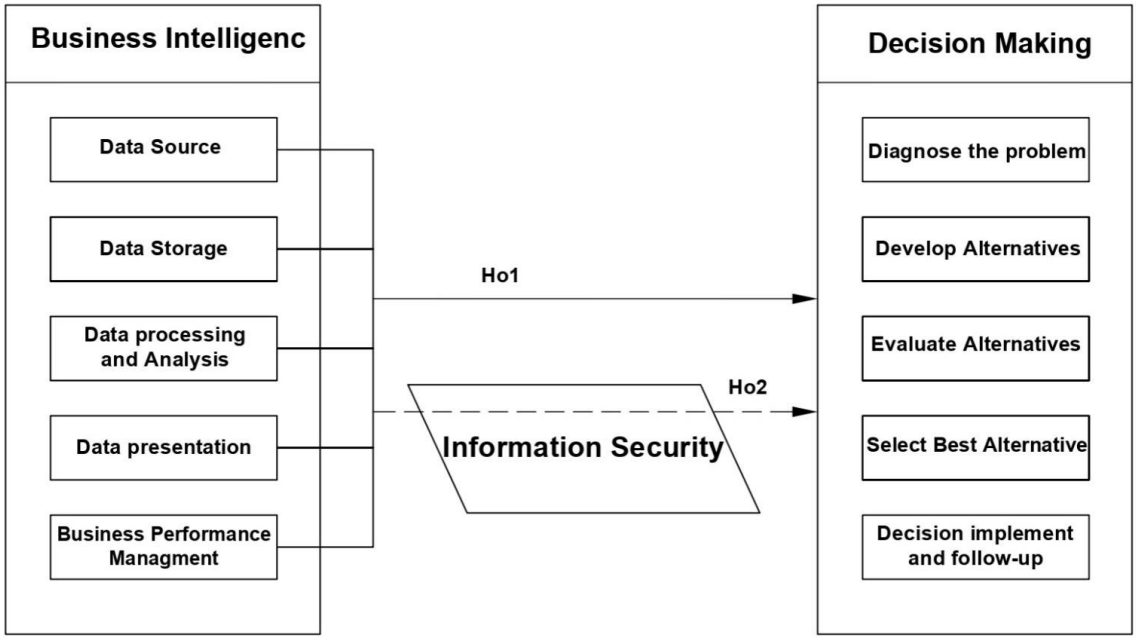

Figure 1 *Study Model*

Source: Independent Variable: (Saltz & Stanton, 2022; Sharda et al., 2020; Al-Omari & Aqil, 2020; Singh, 2019; Witten et al., 2017; Alani, 2014).

Dependent Variable: (Rhoads & Roth, 2022; Hareem, 2020; Tarawneh, 2019; Duan, Edwards, & Dwivedi, 2019; Al-Najjar, 2018; Shrestha, Ben-Menahem, & Georg, 2019; Al-Ashhab, 2015; Hammond et al., 2015).

Mediating Variable: (Awad, 2022; Whitman & Mattord, 2021; Tipton & Krause, 2018; Al-Najjar, 2018; Al-Qahtani, 2015).

Definitions of Terms

-Business Intelligence: It is considered as a number of techniques used for extracting, storing, analyzing, and deriving data, along with obtaining and presenting the essential reports thoroughly to magnify the effectiveness of using data and to maximize and exploit the information in decision making processes to achieve the objectives of the Jordanian commercial banks. All of which were measured in questions ranging from 1 to 25 in the instruments of the study.

-Decision-Making: It is defined operationally as careful selection process and analysis of the indicators for one of the available alternatives that achieve the goals of Jordanian commercial banks in accordance with the available resources and the desired objectives. It was measured using the questions in the study instrument.

-Information Security: It means maintaining protection to the data and information that aim to raise the capacity of the Jordanian commercial banks to protect their data and information from penetration and tampering with them. It was measured using the questions in the study instrument.

Theoretical Framework and Previous Studies

Theoretical Framework

Business Intelligence

The business environment (business climate) changes continuously until it becomes more complicated. It has a constantly changing and evolving nature. The organizations are subjected to pressures that force them to quickly respond to the changing conditions that should be flexible and

innovative in their working nature. They should have the ability to adapt with the evolving conditions to guarantee their continuity and sustainability in practicing their works. Such activities require the organizations to be flexible and to make repetitive operative, tactical, strategic, and quick decisions regardless of the complexity of some of them (Sharda et al., 2018/2020, 29).

Business intelligence is defined as a formation of calculated methods and processes that help in transforming the data into information and then to knowledge that helps in making decisions. Business intelligence systems provide the essential tools that help in preparing effective reporting and analyzing the business information to understand both internal and external regulatory environments, which gives the managers the basic data used in decision-making processes (Sheikhzadeh, 2017).

Business intelligence is a strategic instruments and reports with a group of methodologies and processes that transform the data into significant information and views, such as sales reports, financing reports, predictive analysis to support decision-making (Singh, 2019, 6).

Business intelligence (BI) is defined as a comprehensive definition that combines between the structures, the tools, datasets, analytical tools, applications, and methodologies for more effective achievements in the processes of making daily decisions and empowering the interactive and sometimes the immediate access to the data to facilitate data processing and to give the managers and analytics the ability to conduct some appropriate analysis. By analyzing the historical and current data, and stances; the decision makers are able to obtain valuable insights that enable them to make better and more enlightened decisions (Sharda et al., 2018/2020, 47).

Al-Najjar (2018, 89) defines business intelligences: as applications and technologies that focus on collecting, storing, analyzing, and increasing the capacity of the data related to the problem to enable the users to make better decisions related to their work.

Business Intelligence Dimensions

Sharda et al (2017, 53) points out that the components of business intelligence consist of: (data integration instruments; including, elicitation, transportation, loading, and data warehousing, instant analytical processing systems, data-mining, and data presentation techniques; including, reports, dashboards, and the balanced score board) and they are determined in the processes of: (elicitation, storing, transferring, data warehouse, and data presentation techniques).

However, Thamir and Poulis (2015) identified them by: data sources, transference, data storage, analysis, presentation, and business performance management. Alani (2014, 27) points out that business intelligence elements include a goldmine of data, business analysis, possible decision systems, data mining, and business performance management. He adds that the massive development in the business environment and the flexible architecture attributed by business intelligence make the scope of its technical components not confined to specific numbers or types. In general, taking into account the architectures of business intelligence provided by researchers, it has been agreed to classify business intelligence into data and information sources, data integration techniques, data storage techniques, data analysis techniques and applications, mining techniques, and data presentation (Al-Nasser, 2015, 135).

Based on the foregoing in terms of business intelligence elements and in accordance with the researchers' perspectives, it can be observed that they unanimously agreed on classifying business intelligence elements that will be clarified based on the orientations of the present study as follows:

1. Data Sources: They represent the most important elements that nourish business intelligence with the required data. Business intelligence cannot be confined to framework since any source achieves the system's goal can be adopted. We cannot depend only on one source of data, but rather other sources should be taken into account. By considering business intelligence architectures, the majority of researcher confirmed the Operational Systems or Online Transaction Processing as one of the most important sources of business intelligence data. These systems are characterized by direct contact with users and quickly respond to their needs (Hussein & Al-Shammari, 2017).

Data Munging is defined as transforming un-desired databases into cleaned databases in which their benefits can be monitored. It occurs by creating a group of data from various and diversified resources that contain additional information that is important for the organization. These simple databases are created inside bigger databases groups. The organization becomes able to read inside the big databases and to use diversified tools to process datasets and prepare them to analysis. This type may be not considered as magic, but rather as an important aspect of data science that should be performed appropriately if the organization is ambitious, has a massive data, and seeks to obtain beneficial information that help in making an effective decision (Saltz, & Stanton, 2022, 60).

2. Data Warehouse: This process aims to combine the data with the various resources in one storage technique and preparing it for utilization from various perspectives. Data warehouse is considered as a main warehousing technique of business intelligence systems. Various techniques are used in this phase, including data warehouse. By relying on the techniques of extraction, transference and loading, the data are stored from previous sources of data warehouses and data marts to support business intelligence analyses. Most of the data are structured that are manifested in a form of analytical processing activities. The data warehouse is considered as a subjective and integrative group of data that is time-bound and nonvolatile to support the administrative process related to making decisions (Sharda et al., 2018/2020, 277).

3. Data processing and analysis: it is defined as the process of taking and collecting information from data warehouses and data marts. They are used to nourish the analysis and models of business intelligence to support decisions. It further encompasses data mining process, which means the process of searching and investigating valuable information from massive databases or in data warehouses. It further aims to transform the data from accumulative and incomprehensible data to valuable information that can be exploited in decision-making. The analysis techniques and applications vary according to the analysis purposes or the user to whom analysis is intended. Each user will need different applications to meet his/her needs (Saleh, 2021).

The massive amount of the available data generally determines the traditional methods for data analysis. Therefore, new methods and programs under the name of data mining were developed. Data mining attempts to identify the patterns, orientations, and correlations among the data, particularly among unclear and unexpected patterns. After that, it aims towards using this knowledge for more effective business management. The right place to begin is data warehouses, which are defined as massive databases that are tailored for data mining and studying patterns of data. Data warehouse differs from the databases used by companies in their daily operations (Albright & Winston, 2017, 898).

4. Data Presentation: the information boards are considered one of the pervasive components for most business intelligence platforms, business analysis, business performance management systems, and measurement programs software suites. The business intelligence success relies on achieving its objectives primarily on the success of data presentation techniques in conveying the system outputs effectively. These techniques are considered as a visible part of the business intelligence system. Its effectiveness is measured by its ability to present information in a manner that makes it meaningful to the beneficiary. These techniques are defined as "the process of transforming data, information, and knowledge into graphical representations to support tasks, including, data analysis, information exploration, explanation, predicting the directions, exposing patterns, and exploration (Al-Nasser, 2015, 148).

It is considered an essential technique for business intelligence in which the outputs are presented as well as conveyed to the analytics and the decision is made. The success of business intelligence system relies on achieving its objectives by relying on the success of data presentation techniques in conveying the outputs of the system effectively. This technology is considered a visible part of the business intelligence system. Its efficiency is measured by its ability to present information in a manner that makes it significant to the beneficiary. These techniques are defined as the process of transforming data, information, and knowledge to geographical representations to support tasks, such as data analysis, information exploration, explanation, and prediction (Al-Azzawi, 2015).

5. Business Performance Management: It is defined as the process that contribute to effective management for individuals to achieve high levels of organizational performance to attain the desired objectives that are the shared vision for the objectives of the organizations by relying on the utmost advantages and benefit of the employees' abilities and helping them to achieve such goals. Business performance management is characterized by its constant evaluation and development. Its further deals with employee behaviors, rather than their personalities. It further transforms the performance from a routine working session to the accomplishment of clear and defined goals that are written, clarified, and identified to the workers (Al-Atoum, 2020).

Business Performance Standards Group (2015) point out that business performance management is a conceptual framework that expresses the organization and analysis of business, processes, and related systems' approaches to guide and monitor the overall performance of the organization. All of which seek to help business organizations in translating and developing within valid plans and in a manner that enables it to improve and develop its financial and operational performance (Alani, 2014, 526).

6. Competitive Intelligence: It is defined as a strategic and methodological process that consists of a number of a number of activities that entail gathering, analyzing, and conveying information, along with identifying the organization needs of the competitive intelligence. Then, collecting all the required data from the external environment, followed by analyzing, categorizing, and publishing them in the external environment within an ethical legal domain. Followed by conveying it to the decision makers. It is like the organizations' feedback to achieve the goals of the organization, which enables it to make decisions to achieve competitive advantage. However, the Competitive Intelligence Professionals Association define it as a systematic and ethical process for gathering and analyzing external information

management that might influence the maintenance, decisions, and processes of the company (Saleh et al., 2010, 330).

Decision-Making

Decision-Making is considered as the focal, the essence, and the key vehicle of the administrative process in achieving the objectives of the organizations. It is regarded as one of the essential processes at the level of administrative organizations and a stepping-stone to all activities inside and outside the organization. It is an overlapped process for the whole activities and positions of the management. Decision-making is defined as one of the most important and the most influential elements in the lives of individuals and administrative organizations. The decisions rely heavily on anticipating the future in various fields at the short, intermediate, and long term. It depends entirely on the available information for decision-making (Al-Ashhab, 2015, 20).

Robbins and Couter (2021, 157) have defined decision-making as a number of steps that begin with identifying and defining the problems as well as the criteria of decision, providing values to such criteria and then working on improving and analyzing the alternatives as well as selecting the alternative that might solve the problem. After that, implementing the selected alternative and evaluating the effectiveness of the decision.

Decision-making is defined a task or activity that depends on selecting among alternative. It cannot be achieved without an objective or referring to the context. The decision is made by decision makers to solve a particular problem (Mukherjee, 2021, 25).

The researchers believe that decision-making process is connected with methods, procedures, and data that are analyzed and predicted by business intelligence application to make best and optimal decisions, to achieve the organization's goals, rapidly respond to events that might face the organization to prevent them from reoccurrence and to reduce their impacts for the continuity of the organization, the restoration of its activity, defining a clear methodology for learning and feedback to deal with it more effectively in the future.

Decision-Making Dimensions

Diagnosing the Problem Nature: Examining the problem is the first phase of decision-making processes. It means investigating its true reasons, determining the status in which the administration is not satisfied with and aims to dispose of, investigating the main reason behind it. Therefore, those authorized in decision-making should ask artistic expertized for assistance to diagnose the problem properly. The error in determining the problem leads to errors in all its following phases. To put it differently, the problems of administrative decisions should be identified, and priorities should be developed to solve and reformulate the problem (Al-Fadl, 2014, 24).

Defining the problem is considered as the process that leads to formulating the problem that is sought to be solved by the organization. Determining the problem is the main key for increasing the effectiveness of decision-making. It includes a survey of an internal and external environment, and determining the problem that we aim to solve. Upon defining it, we must look for a solution (Al-Najjar, 2018, 151).

Determining the Problem and Finding Alternatives: It means investigating and determining the stance dimensions, the problem nature, finding solutions and other methods to solve the problem, determining the whole solutions, developing a conception and an alternative for each one of them to have another alternative if any of them has failed. The decision maker

should take specialists' opinions. He/she should develop other possible alternatives and acknowledge them from his/her similar experiences and situations (Amer & Al-Masry, 2016, 62).

The alternatives are the raw material for decision-making. They represent a group of possible solutions that will be available for solving problems due to its central importance. It needs establishing and maintaining a high level of problem analysis, generating and innovating alternatives that should be ideal and compatible with various working tracks of the organization. The decision maker should choose one of them. He/she should find and think of other alternatives. More importantly, he/she understands the consequences for each alternative and how successful it is in meeting the organization goals. In some cases, the alternative is appealing, misleading, and exciting. However, the consequences for each alternative should be evaluated in terms of its ability to fully achieve the objectives of the organization (Hammond et al., 2015, 47).

Assessments of Alternatives: This stage means identifying the possible alternatives for solving the problem, it occurs by setting high expectations by thinking of completely new methods of evaluations instead of descending by making modest changes in the current situation. Since a variety of problems has their restrictions that might limit your alternatives, the assessments of alternatives process help in selecting the appropriate alternative. You cannot choose an alternative that you did not think of or evaluate. Regardless of the number of alternatives you have, the alternative that you have chosen cannot be the best one. Consequently, the outcomes of searching for good, new, and creative alternatives might be significantly high (Hammond et al., 2015, 50).

Different methods in the assessment process are used to enhance the ability of the organization to solve problems. One of these methods is determining the strengths and the weaknesses points for alternatives. Meanwhile none of these organizations uses the smartness and the imagination of the participants in the process of fully decision-making, but rather the participation process occurs among the experts. The additional strength points encompass the reality that all the alternative techniques are discussed in detail and used in an appropriate time unless the problem itself is related to implementation. In brief, the general strengths of problem-solving techniques are represented in encouraging boldness and originality in solving problems, promoting flexibility, and promoting changes in the direction of thought related to the specific problem that is processed and by providing essential infrastructure at the same time, concerning in training trajectory, and finding alternatives as well (Rhoads & Roth, 2022, 46).

Selecting the Best Alternative: It is a precise process that aims to choose among the alternatives and options. In other words, selecting an alternative in which the decision maker considers it right or closer to the right when the information is not sufficient or adequate about the problem. It is regarded as an accurate differentiation process between two alternatives or more enjoying one or similar value or in which the odds ratio is tiny (Odah. 2018, 356).

The process of selecting the best alternative is one of the most precise resolution phases because selecting an alternative option means resolving the situation and achieving the outcome for the exerted effort. This matter needs a high level of efficacy and the autonomous capacity for the decision maker to make the right choice (Odah, 2018, 353-354).

Decision Implement and Follow-Up: After the previous processes of analyzing, determining, and choosing the best alternative, alternative implement and follow-up will be required where developing plans and related goals to implementing the decision are made i.e., the results to be achieved to implement the decision and solve the problem. The proper and effective implementation of the decision has a big impact on achieving the desired goals. It compares the results that the decision maker has achieved and the expected results from implementation i.e., investigating if there is any gap between what was achieved and what was planned. However, if a system that compares between the performance and criteria was found, a deviation between steps and implementation might be discovered. This matter needs procedures for correcting or making necessary corrective action (Tarawneh, 2019, 180).

In this phase, a plan for monitoring the results of making decision to examine its effectiveness and the extent of achieving the desired objectives from the alternative, allocating the essential timeline for implementing the decision, stages of implementation and the workers in charged with implementation, determining the responsibilities and the methods for implementing the alternative and the methods of monitoring it and addressing any problem arising during its implementation and developing plans to address them and finding alternatives along with the original alternative (Hareem, 2020, 94).

Information Security

Information security concept is defined as "preserving the availability, integrity, confidentiality, ownership of information, taking advantage of it, and protecting them from overlapping use, sabotage, misleading, distortion, replacement, misinterpretation, cancellation, misuse, or access, displaying, monitoring, copying, or stealing it" (Al-Ta'I & Al-Kilani, 2015, 34).

Cisco (2022) points out that information security is defined as the processes and tools designed and deployed to protect sensitive business information from modification, disruption, destruction, and inspection.

Moreover, it is defined as maintaining the confidentiality, integrity, and availability of information, while the information security management system is defined as coordinated activities to direct and control the information confidentiality, its integrity, and availability (Tipton & Krause, 2018, 37).

It is the protection of computer and non-computer equipment, facilities, data and information from dangers, as it is a set of preventive procedures and measures used by the organization on information and its confidentiality, whether from internal or external dangers, such as keeping it from stealing, manipulation, penetration or illegal destruction, whether before, during, or after data entry into computer by checking the entries and keeping them in a safe place and naming the persons authorized to deal with this data. Therefore, the security of systems and information encompasses ensuring security when entering information, its transmission within the organization, storage and use, and ensuring that all or some of the elements of information security depends on the information under protection and its uses and related services, not all information requires the same strength of confidentiality to ensure non-disclosure, and not all information in one facility is equally important in terms of accessing or ensuring that it is not tampered with (Al-Najjar, 2018, 261).

Information Security Dimensions

There are diverging views regarding the concepts of information security, the specialists in law mention the three dimensions, namely, integrity, confidentiality, and availability. They called it as CIA triangle. Chapple et al (2018, 58-60) has used these three primary dimensions of information security:

-Integrity: It is the concept of protecting data reliability, validity, and integrity protection that prevents unauthorized data modifications, ensures that data remains correct, unaltered, and maintained. The safety protection that is properly applied provides a means of authorized changes with protecting against unauthorized activities both intentional and malicious (such as viruses and spam) and the errors committed by authorized users.

-Confidentiality: It means the measures used to ensure the privacy and protection of data, objects, or resources. The aim of privacy protection is to prevent or reduce the unauthorized access to data. The confidentiality and security measures focus on ensuring that no one other than the intended recipient of the message receives it. The confidentiality provides a means for authorized users to access and interact with resources. However, it prevents unauthorized users from doing so. A wide range of security controls can provide protection for confidentiality, including but not limited to encryption, access controls, and concealment of information.

-Availability: It provides each authorized person with timely and uninterrupted access to objects. Availability protection controls often support sufficient bandwidth and timely processing as necessary by the organization or situation. If the security mechanism is availability, it will provide a high level of assurance that the data, objects, and resources are accessible by authorized persons. Availability includes effective, uninterrupted access to objects and prevention of denial-of-service (DOS) attacks. It further indicates that the supporting infrastructure - including network services, communications, and access control mechanisms- is functioning and allowing authorized users to obtain authorized access to the data.

Previous Studies

In his study, Al-Azmi (2022) concludes that there are significant differences about the nature of the risks that threaten the security of electronic accounting information, and the lack of significant differences about the necessary measures to reduce the risks of electronic accounting information in Kuwaiti commercial banks.

Moreover, Al Eid and Yavuz (2022) concluded that decision support systems and business intelligence are well available in Syrian civil society organizations in Gaziantep city. Similarly, it was found that there is a strong positive relationship between business intelligence and decision support systems with strategic decision-making. Based on analyzing the data of the study and testing its hypotheses, it was also concluded that there is an impact of decision support systems and business intelligence on the strategic decision-making process in the Syrian civil society organizations in Gaziantep city.

Likewise, Niu et al (2021) study deduced that using improved data management method by using big data analytics (ODM-BDA) increase intelligence and organizational effectiveness and analysis of decision-making in organizations. Its accuracy rate amounts (96.1%), a low error rate accounts for (0.66%), an efficiency rate accounts for (97.2%), the

accuracy reaches to (96.3%), true positive rate is (80.6%), the lower latency amounts (52.8%), and the cloud is not just only a storage space anymore, but also it is a function affects every aspect of the software business. To clarify, it enables the big data innovations available through enterprise cloud infrastructure to make strategic decisions based on information to predict future ideas and trends. The study recommended the need to an effectively use of the information collected during daily activities by finding emerging opportunities, detecting potential risks, strengthening decision-making frameworks, optimal use of business intelligence, and depending on information systems that rely heavily on central and internal business data in China.

Birznieks and Licite-Kurbe (2021) found that global business intelligence reached (18.3) billion euros in 2017 and is expected to rise to (22.8) billion euros in the near future, as these technologies provide companies with a number of benefits: it present new information to make business decisions, financial reports in real time and automate manual work, and that many companies around the world are not achieving the desired results to apply business intelligence and data warehousing technologies in Latvian business firms.

Jawa (2021) study concluded that using business intelligence systems has a positive impact on the effectiveness of decision-making in the General Organization for Social Insurance in Jeddah, and one of the most prominent obstacles facing the application of the business intelligence system in the institution is the lack of awareness regarding the importance of the business intelligence system for the activities and procedures of the institution, along with the insufficient training of users on the business intelligence system.

Moulay et al (2021) found that emotional intelligence leads to professional success for individuals, helps the organization to continue and increases its efficiency, develops banks and keep abreast of developments to achieve goals, and links artificial intelligence with administrative decision-making. The study recommended increasing the holding of training programs for employees to provide them with emotional intelligence skills, providing development programs for decision-making skills, seeking help from experts specializing in the field of emotional intelligence to train employees on how to use it, employing it in the decision-making process, and intensifying training sessions as well as training courses in commercial banks in Algeria.

Sadaqa (2020) found that there is an impact of business intelligence with its dimensions; including data integration, interaction of business intelligence transparency, and analytical and intelligent decision support on data quality and on the quality of decisions, and the impact of data quality with its dimensions; accuracy, utility, and accessibility on the quality of decisions in telecommunications companies in Jordan.

Methodology

Study Design

"This study is practical in nature and explanatory in terms of purpose. It is unplanned regarding planning and control because it takes place in a natural environment. It is a cross-sectional study in terms of time-horizon" (Al-Najjar et al., 2020, 53-56). It is "a quantitative study in terms of procedures" (Saunders et al., 2007, 145).

The Adopted Strategy

The researchers relied on survey/ sampling strategy by relying on a sample representing the population of the study.

Population of the Study

It consists of top and middle level of management in the commercial Jordanian banks that account for (334) distributed in (13) Jordanian commercial banks.

Sample of the Study

"The sample of the study representing the population (study community) is (375) out of (186) from top and middle level of management (Al-Najjar et al., 2020, 109) from Jordanian commercial banks. However, the researchers intended to distribute (230) questionnaires as a precaution to guarantee the representation of the population, (223) questionnaires were retrieved and valid for statistical analysis. Table No. (1) illustrates the distribution of the population and the sample of the study on the Jordanian commercial banks. Table No. (1) presents the number of employees in the top and middle management in the Jordanian commercial banks:

Table 1

The Number of Employees in the Top and Middle Management in the Jordanian Commercial Banks

No.	Banking Name	Top and Middle Management	Sample Size
1.	Arab Bank	37	23
2.	Arab Banking Corporation	23	14
3.	Bank of Jordan	28	17
4.	Cairo Amman Bank	26	16
5.	Capital Bank Jordan	26	16
6.	Jordanian Commercial Bank	31	19
7.	Jordan Kuwait Bank	29	18
8.	Jordan Ahli Bank	37	22
9.	Housing Bank for Trading and Financing	35	21
10.	Arab Jordan Investment Bank AJIB	23	14
11.	Investment Bank	25	16
12.	Societe Generale De Banque Jordan – SGBJ	26	16
13.	Bank al Etihad	29	18
Total		375	230

Source: Central Bank of Jordan (Statistics of Banks in Jordan / 2022) (http://www.cbj.gov.jo)

By referring to the websites of Jordanian commercial banks, where the number of administrators from the top management and the number of administrators in the middle management of each bank were extracted.

Data Collection Methods

The researchers used both primary and secondary sources for collecting the data as follows:

The Secondary Data: The researchers collected information related to the current study by referring to secondary data sources that are manifested in "Arabic and foreign related references, articles, periodicals, reports, research, previous studies that tackled this subject, and surfing various internet websites" (Al-Najjar et al., 2020, 110).

Primary Resources: The researchers resorted to collect primary data from the questionnaire as the main instrument of the study to address various analytical aspects regarding the subjects of the study. The questionnaire included a number of statements that reflected the variables of the study to achieve the objectives of the study. The questionnaire reflected the variables and dimensions of the study in which the independent variable (business intelligence with its dimensions) and the dependent variable

(decision making with its dimensions), and the mediating variable (information security) are included. It was distributed to top and medium administration management from the sample of the study in the Jordanian commercial banks. The researchers relied on APA (2020) citation style for citing the data.
As Shown in table No. (2) Personal and Functional Characteristics.

Table 2
Personal and Functional Characteristics

Variable		Frequency	Percentage
Gender	Male	162	73.6
	Female	58	26.4
Age	Less than 30 years	28	12.7
	30 years- less than 40 years	58	26.4
	40 years- less than 50 years	98	44.5
	50 years and older	36	16.4
Years of Experience	Less than 5 years	17	7.7
	5 years- less than 10 years	64	29.1
	10 years-less than 15 years	82	37.3
	15 years and more	57	25.9
Occupation	Manager	48	21.8
	Assistant Director	61	27.7
	Administrative Committee Member	45	20.5
	Head of the Department	66	30
Qualifications	Community College Diploma or low	5	2.3
	Bachelor	129	58.6
	Master	73	33.2
	Ph.D.	13	5.9

It is clear from Table No. 2, the personal characteristics of the sample.

Describing the Variables of the Study

Table 3
Describing the Variables of the Study

Variable	Means	Relative Importance
Business Intelligence	4.0275	High
Decision-Making	3.9560	High
Information Security	4.2153	High

As shown in Table No. (3), the relative importance for the three variables (business intelligence, making-decisions, and information security) were higher, which means that Jordanian commercial banks are concerned with them.

Testing Measurement Model

Testing Measurement Model (Outer Model) (Hair et al., 2017)

The aim of testing measurement model is to obtain validity and reliability as defined below:
-Validity: It means measuring the required i.e., the ability of testing measurement model to serve its objective.

-Reliability: It means the ability of testing measurement model to measure the required under several conditions. The testing measurement model is divided into two sections:
1. Convergent Validity.
2. Discriminate Validity.

Testing Convergent Validity
It consists of three tests as illustrated below:
1. Individual Item Reliability that should be bigger than (0.70).
2. Composite reliability that should be bigger than (0.70).
3. Average Variance Extracted that should be bigger than (0.50).

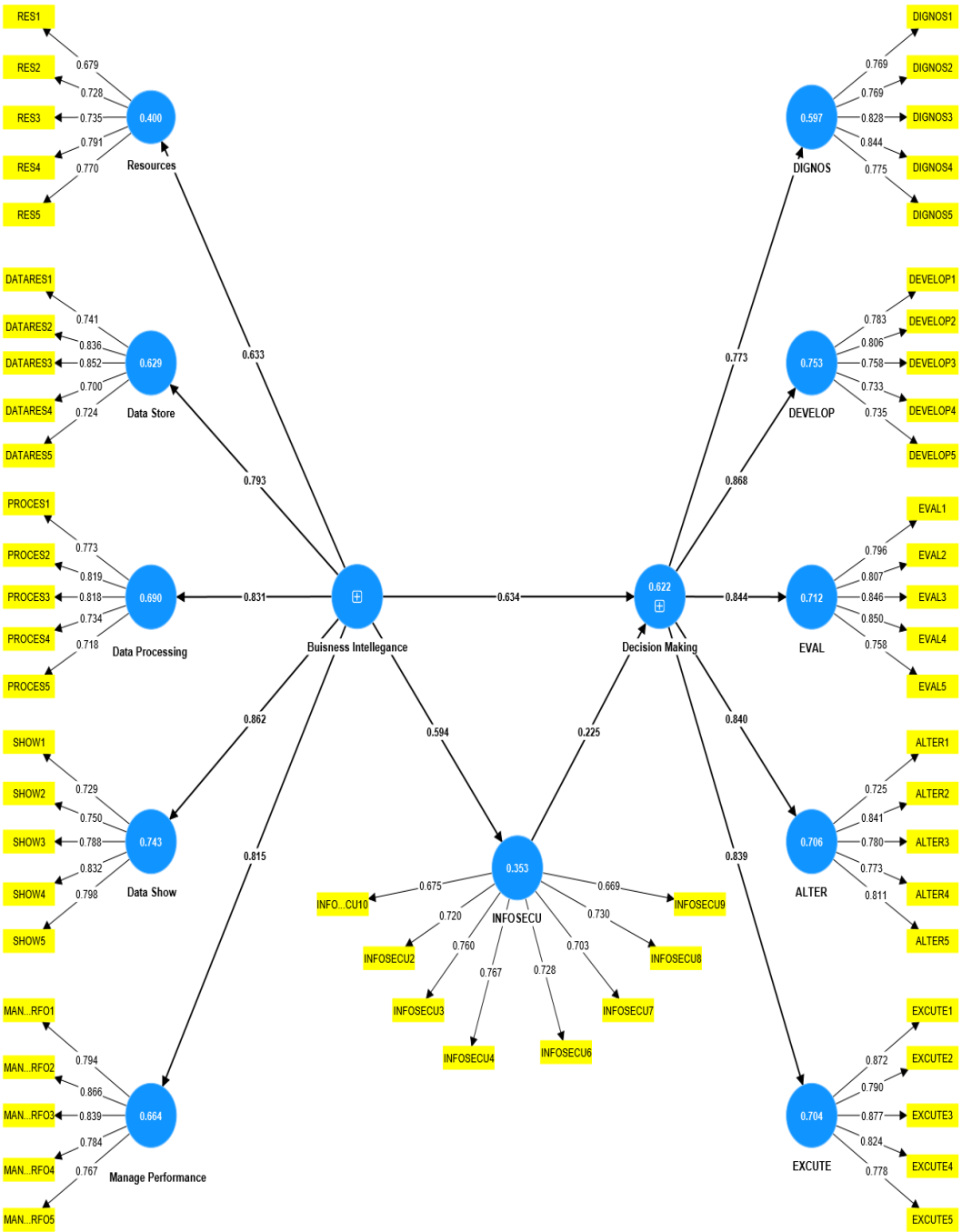

Figure 2 *The saturation of the study indicators*

Table 4
Testing Measurement Model (Outer Model)/ Convergent Validity

Construct	Item	Factor Loading	Conbach's alpha	CR		AVE
				Rho-a	Rho-c	
Data Sources	Q1	0.679	.797	.806	.859	.550
	Q2	0.728				
	Q3	0.735				
	Q4	0.791				
	Q5	0.770				
Data Storage	Q1	0.741	.830	.836	.831	,598
	Q2	0.836				
	Q3	0.852				
	Q4	0.700				
	Q5	0.724				
Data processing and Analysis	Q1	0.773	.831	.832	.881	.598
	Q2	0.819				
	Q3	0.818				
	Q4	0.734				
	Q5	0.718				
Data Presentation	Q1	0.729	.838	.840	.886	.609
	Q2	0.750				
	Q3	0.788				
	Q4	0.832				
	Q5	0.798				
Business Performance Management	Q1	0.794	.869	.874	.905	.657
	Q2	0.866				
	Q3	0.839				
	Q4	0.784				
	Q5	0.767				
Diagnose the Problem	Q1	0.769	.857	.863	.897	.636
	Q2	0.699				
	Q3	0.828				
	Q4	0.844				
	Q5	0.775				
Develop Alternative	Q1	0.783	.820	.820	.875	.583
	Q2	0.806				
	Q3	0.758				
	Q4	0.733				
	Q5	0.735				
Evaluative Alternative	Q1	0.796	.871	.873	.906	.660
	Q2	0.806				
	Q3	0.846				
	Q4	0.850				
	Q5	0.758				

Selected Best Alternative	Q1	0.725	.846	.848	.890	.619
	Q2	0.841				
	Q3	0.780				
	Q4	0.773				
	Q5	0.811				
Decision Implement and Follow-up	Q1	0.872	.886	.890	.916	.687
	Q2	0.790				
	Q3	0.877				
	Q4	0.824				
	Q5	0.778				
Information Security	Q2	0.720	.868	.872	.896	.518
	Q3	0.760				
	Q4	0.767				
	Q6	0.728				
	Q7	0.703				
	Q8	0.730				
	Q9	0.669				
	Q10	0.675				

A closer inspection of Table No. (4) shows:
1. The questions (factors) that have achieved (0.66) and above were uploaded, whereas the questions that were lower than that were deleted. Four numbered questions of the mediating variable were included (Q1= 0.639, Q5= 0.657, Q11= 0.646, Q12= 0.640). Only questions reached (0.66) and above remained.
2. It has been indicated that all Cronbach Alpha values for the variables ranged between (0.797-0.886) and all of them are bigger than (0.70), which indicate good reliability (Hair et al., 2017, 138).
3. It has been revealed that the combination reliability values for the variables were higher than (0.70).
4. It was found that all the values of the calculated mean of variance (AVE) for the variables were greater than (0.50) (Hair et al., 2017, 138).
The results of the convergent validity indicators confirm the availability of convergent validity from testing measurement model.

Testing Discriminate Validity
It is represented in two types of testing as follows:
1. Cross Loading
2. Variable Correlation (Root Square of AVE).
Table No. (5) Discriminate Validity, Fornell-Larcker criterion, independent variable.

Table 5
Discriminate Validity, Fornell-Larcker criterion, independent variable

Variables	Data Sources	Data Storage	Data Processing and Analysis	Data Presentation	Business Performance Management
Data Sources	0.742				
Data Storage	0.469	0.773			
Data Processing and Analysis	0.399	0.605	0.773		
Data Presentation	0.409	0.538	0.706	0.780	
Business Performance Management	0.401	0.534	0.530	0.677	0.811

It is clear from the table (5) that the correlation between the sub-variables of the independent variable Business Intelligence came between the Data Sources with itself (0.742), which is higher than the correlation between the rest of the variables, while Storing the Data with itself (0.773), which is higher than all other correlations with the rest of the variables, while the dimension of Data Processing and analysis with itself (0.773), which is higher than the correlation with all other variables, while the dimension of Data Presentation with itself (0.780), which is higher than the correlations with the rest of the other variables. Finally, the inter-correlation of the Business Performance Management dimension with itself came (0.811) It is higher than all correlations with other variables of the independent variable Business Intelligence.

The foregoing analysis supports the discriminatory validity of the sub-variables of the independent variable Business Intelligence (Hair et al., 2017,144).

Table No. (6) Discriminate Validity, Fornell-Larcker criterion, dependent variable.

Table 6
Discriminate Validity, Fornell-Larcker criterion. dependent variable.

Variables	Diagnose the problem	Develop Alternatives	Evaluate Alternatives	Select Best Alternatives	Decision implement and follow-up
Diagnose the problem	0.798				
Develop Alternatives	0.645	0.763			
Evaluate Alternatives	0.505	0.701	0.812		
Select Best Alternatives	0.532	0.614	0.702	0.787	
Decision Implement and follow-up	0.571	0.668	0.586	0.647	0.829

It is clear from the table (6) that the correlation between the sub-variables of the dependent variable Decisions Making came between Diagnosing the Problem with itself (0.798), which is higher than the correlation between the rest of the variables, while Developing Alternatives with itself (0.763), which is higher than all other correlations with the rest of the variables, while the dimension of Evaluate the Alternatives with itself (0.812), which is higher than the correlation with all other variables, while the dimension of Selecting Best Alternative with itself (0.787), which is higher than the correlations with the rest of the other variables, Finally, the inter-correlation of the dimension of decision implementation and follow-up with itself came (0.829) which is higher than all correlations with other variables of the dependent variable of Decision-making.

The foregoing analysis supports the discriminatory validity of the sub-variables of the dependent variable Decision-making (Hair et al., 2017,144).

Table No. (7) illustrates the variables loading and their correlation with each other.

Table 7

Discriminate Validity (Heterotrait- monotrait (HTNT)- Matrix)

Variables	**Business Intelligence**	**Decision Making**	**Information Security**
Business Intelligence	-		
Decision-Making	0.818	-	
Information Security	0.648	0.655	-

As indicated in Table No. (7) that the correlation between the various latent variables ranged between (0.648-0.818). It is in general less than (0.90). These correlations are statistically accepted to prove discriminatory validity (Hair et al., 2017,144).

2. Variable Correlation (Root Square of AVE).

The root square of AVE was calculated by EXCEL program, if Root Square of AVE for the variable is bigger than (0.50). The Table No. (8) shows Root Square of AVE for the variables:

Table 8

Variable Correlation (Root Square of AVE)

Construct	***Root Sq* AVE**	**Construct**	***Root Sq* AVE**
Data Source	0.741	Diagnose the Problem	0.797
Data Storage	0.773	Develop Alternative	0.763
Data Processing and Analysis	0.773	Evaluative Alternative	0.812
Data Presentation	0.780	Selected Best Alternative	0.786
Business Performance Management	0.810	Decision Implement and Follow-up	0.828
		Information Security	0.719

It is clear from the Table that the calculated square of root of variance values more than (0.50), which indicates discriminatory validity of the model (Hair et al., 2017,144).

Testing of Structural Model (Inner Model)

The necessary tests have been carried out to prove the structural model, which includes:

1. Coefficient of Determination R^2

2. Effect Size f^2
3. Predictive Relevance q^2
4. Hypotheses testing (Path Coefficient).

The following tables present the results of these results:

1. Coefficient of Determination R^2.

Table No. (9) showed the results related to Coefficient of Determination R^2

Table 9
R-Square of the Endogenous Latent Variable

Construct	R^2	Adjusted R^2	Result
Decision Making	0.622	0.618	Moderate
Information Security	0.353	0.350	Moderate

As indicated in Table No. (9), the variance values explaining the model explains (62.2%) of variance in terms of making-decision with intermediate ratio for the variables, and that the business intelligence was able to explain (35.3%) of variance in terms of information security with intermediate ratio for the variables.

Table (10) shows the effect size (f^2):
Table 10
f Square

	Business Intelligence	Information Security	Decision Making
Business Intelligence	-	0.546 High Effect	0.686 Large Effect
Information Security		-	0.087 Small Effect

As shown in Table (10) the effect size of business intelligence in information security has amounted to (f^2 =0.546), which is a large effect size. The effect size of business intelligence in making decisions has amounted to (f^2 =0.686), which is a large effect size. As for the effect size of information security in making decisions has accounted for (f^2 =0.087), which is small effect size.

Table No. (11) shows the predictive relevance of the model.

Table 11
Q Square predicts

	Q^2 predict
Decision Making	0.585

As indicated in Table No. (11), the (Predictive Relevance Q^2= .585) is greater than zero, which denotes the ability of the model to predict (Hair et al., 2017, 216).
The previous analyses confirm the validity of the structural model.

Hypothesis Testing

The study relied on (Smart PLS4) and Preacher and Hayes 2008 theory to analyze the hypotheses after the following two conditions are met to prove the mediator:
1. Demonstrating the relationship between the independent variable (business intelligence with its dimensions) and the dependent variable (decision making with its dimensions) by the

mediating variable (information security) in which the relationship should be significant by Bootstrap the Indirect effect (total effect).

2. Conducting Bootstrapped of Confidence Interval (Lower and Upper level) in which the lower level and the above zero level should not be intersected until the mediator's requirement is met. Table No. (12) shows the results of indirect effect testing.

Table 12
Total indirect effect between the independent and dependent variable

Path Coefficients	Original sample	St.d	T statistics	P values
Business Intelligence ⟶ Decision Making	0.134	0.037	3.641	0.000

As indicated in Table No. (12), there is an indirect effect for the mediating variable (information security) that mediates the relationship between business intelligence and decision-making that amount to (0.134). It further shows that (t) statistics value accounted for (3.641) at the significance level (Sig=0.000), which proves the significance of indirect path and fulfils the first condition.

To meet the second condition, Bootstrapped Confidence Interval (Lower and Upper level) was calculated. Table (13) shows (UL, LL) values for the mediator.

Table 13
Account values (UL, LL) Mediator

Bootstrapped of Confidence Interval		T statistics	Std.	Indirect effects	Path b	Path a
UL 95%	LL 95%					
0.226	0.042	2.844	0.047	0.134	0.225	0.594

As indicated in Table No. (13), the lower-level value is (LL= 0.042), whereas the upper-level value is (UL= 0.226) that was extracted statistically and does not intersect with zero, which means achieving the second condition of mediator.

Discussing the Hypotheses of the Study

The various hypotheses of the study are discussed by Figure No. (3) and Table No. (14) Path Coefficients.

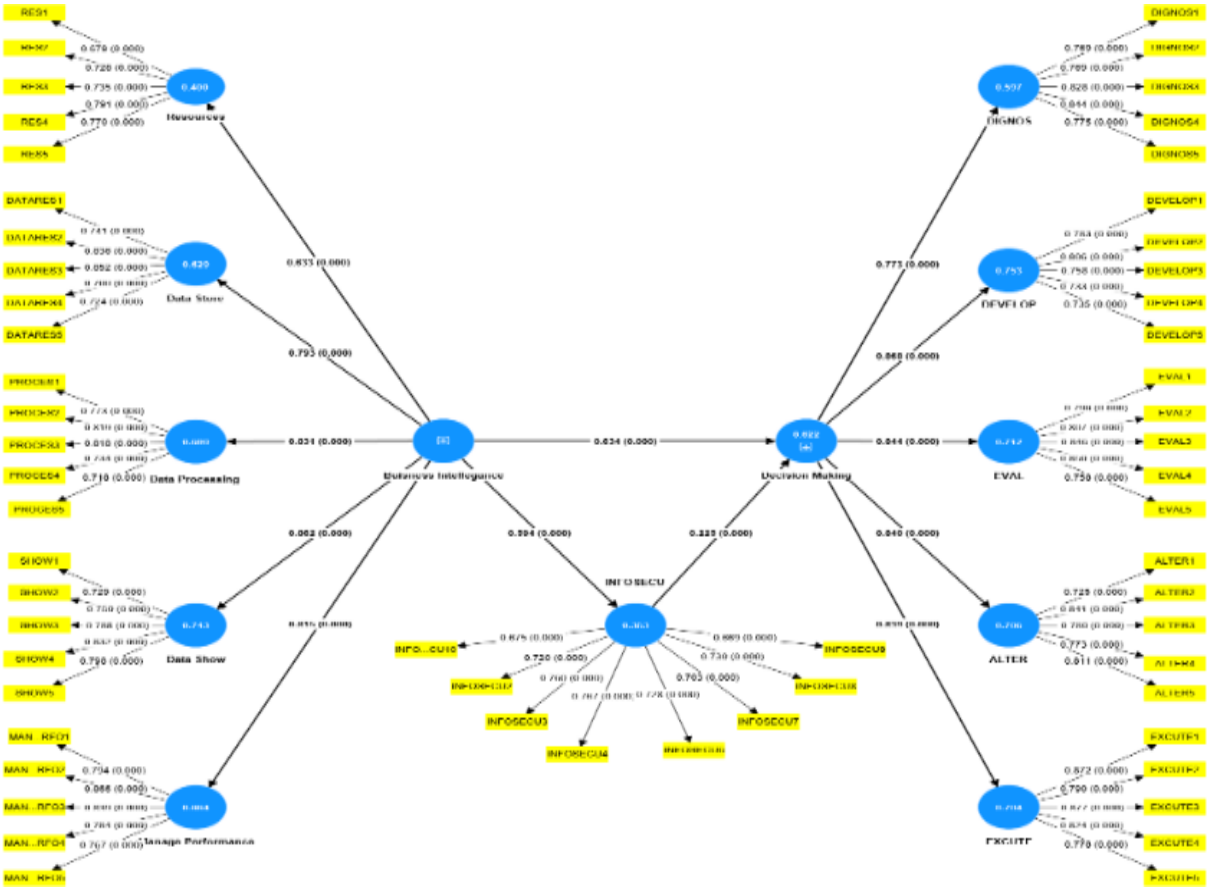

Figure 3
Original Sample, Sig., R square

Table 14
Path Coefficients

Path	Original sample	Standard deviation	T statistics	Sig
Business Intelligence → Decision Making	0.634	0.050	12.570	0.000
Business Intelligence → Data Store	0.633	0.057	11.011	0.000
Business Intelligence → Data Storage	0.793	0.033	24.164	0.000
Business Intelligence →Data processing and analysis.	0.831	0.030	27.421	0.000
Business Intelligence → Data Presentation	0.862	0.020	43.484	0.000
Business Intelligence → Data Performance Management	0.815	0.025	32.551	0.000
Business Intelligence → Information Security	0.594	0.064	32.551	0.000
Information Security → Decision Making	0.225	0.057	3.909	0.000

The following section discusses the hypotheses of the study by the holistic model and the accompanied Tables

Discussing the First Hypotheses of the Study

Figure No. (3) and Table No. (14) above articulate the relationship between business intelligence with its dimensions and decision-making that accounts for (β= 0.634),

the (t = 12.670) value at the significance level accounts for (Sig = 0.000), which underscores that the relationship between business intelligence with its dimensions and decision-making is significant and that business intelligence with its dimensions construe an amount of (63.4%) of variance at decision-making at Jordanian commercial banks.

It is further indicated that data sources coefficient accounted for (β = 0.633) and that the value (t = 11.011) at the significance level (Sig = 0.000), which is less than (0.05) significance, which in turn, indicates the significance of data sources coefficient.

It has been further indicated that Beta value for data storage accounts for (β =0.793), while (t= 24.164) at the significance level (Sig =0.000) that is lower than (0.05) significance. Thus, it confirms the significance of data storage coefficient.

It has been confirmed that standardized Beta value for data processing and analysis accounts for (β =0.831), t-value accounts for (t = 27.421), and the significance level is (Sig = 0.000), which is less than (0.05) significance, which confirms the significance of data processing and analysis coefficient.

It has been further indicated that standardized Beta value for presentation of data coefficient amounts to (β =0.862), t-value accounts for (t = 43.848), the significance level is (Sig = 0.000), which is less than (0.05) significance, which confirms the significance of presentation of data coefficient.

It has been further indicated that the standardized Beta value for business performance management accounts for (β =0.815), t-value amounts to (t = 32.551), the significance level (Sig= 0.000) which is less than (0.05), which confirms the significance of business performance management.

Based on the foregoing, the significance of the coefficients is established in the independent variable (business intelligence), and based on the above analysis, we cannot accept the first null hypothesis, and we accept the alternative hypothesis that states: “There is a statistically significant effect at a significant level (α ≤ 0.05) for business intelligence with its dimensions (data sources, data storage, processing and analysis of data, data presentation, and business performance management) on decision-making with its dimensions (problem diagnosis, finding alternatives, evaluating alternatives, selecting the best alternative, and assessing and decision implement and follow up) at Jordanian commercial banks”.

Discussing the Second Main Hypothesis

It is evident from Figure (3) and Table (14) that the relationship between business intelligence and information security accounts for (β = 0.594) and that t-value amounts to (t = 10.983) which is at a significance level (sig = 0.000), which proves that the relationship between the two variables is significant. It is further indicated that all standard beta values for business intelligence transactions at different beta levels are significant, and the above proves the existence of a statistically significant effect at a significant level (α ≤ 0.05) for business intelligence with its dimensions (data sources, data storage, data processing and analysis, data presentation, performance management business) in information security in the Jordanian commercial banks.

As shown in Figure (3) and Table (14), the relationship between information security and decision-making accounts for (β = 0.225), and the t-value amounts to (t = 3.909) at a significance level (Sig = 0.000), which is significant and less than (0.05). This proves that there is a statistically significant effect at a significant level (α ≤ 0.05) of information security on decision-making at Jordanian commercial banks.

The Measurement Model was previously discussed, and all the conditions for achieving the mediator were elaborated. Accordingly, the second hypothesis, which contains the median, will be discussed based on Figure (3) and Table (15), which shows the direct and indirect effects between the variables.

Table (15) illustrates the significance of path coefficients among different variables.

Table 15
Path coefficients for the total effect

Path	Original sample	T statistics	Sig
Business Intelligence ⟶ Decision Making	0.767	20.496	0.000
Business Intelligence ⟶ Information Security	0.594	10.983	0.000
Information Security ⟶ Decision Making	0.225	3.969	0.000

As shown in Table (15) regarding the path's significance (total effect), the standardized beta values for all paths at various t-value are significant and all are at the significance level (Sig=0.000).

Table (16) also shows the direct and indirect impact of loading various paths in the model.

Table 16
Direct and indirect effects of paths analysis

Path	Total direct effects	Total indirect effects	Total effects
Business Intelligence ⟶ Decision Making	0.634	0.134	0.767
Business Intelligence ⟶ Information Security	0.594		0.594
Information Security ⟶ Decision Making	0.225		0.225

Table (16) shows that the direct normative effect of business intelligence with its dimensions on decision-making at Jordanian commercial banks amounted to (0.634), while the direct normative effect of business intelligence with its dimensions in information security accounted for (0.594), and the direct normative effect of information security on decision-making is (0.225), and all values are significant.

Hence, the indirect normative effect of information security between business intelligence and decision-making accounts for (0.134), as the total standard effect between business intelligence with its dimensions and decision-making at Jordanian commercial banks reaches (0.767), and this means that business intelligence with its dimensions was able to explain (63.4%) of the discrepancy on decision-making, and that information security was able to explain (13.4%) of that discrepancy. Thus, the total interpretation of the model with the presence of the mediating variable (information security) is (76.7%) of the discrepancy on decision-making with at dimensions in the Jordanian commercial banks.

Based on the above, we cannot accept the second null hypothesis, and we accept the alternative hypothesis that states: "There is a statistically significant effect at a significant level ($\alpha \leq 0.05$) for business intelligence with its dimensions (data sources, data storage, data processing and analysis, data presentation, and business performance management) on decisions making with its dimensions (diagnosing the problem, finding alternatives, evaluating alternatives, selecting the best alternative, and decision implement and follow-up) in the presence of information security at Jordanian commercial banks.

Findings and Recommendations

Discussion

1. Relative Importance for Variables: the findings revealed that the relative importance for the variables of the study (business intelligence, decision-making, and information security) were all high. Information security occupied the first rank, followed by business intelligence, and subsequent by decision-making. These findings indicate that the respondents in Jordanian commercial banks are concerned with modern administrative concepts.

The findings of the present study regarding the relative importance agreed with Al Eid and Yavuz (2022) study, which revealed that there is a strong relationship among the business intelligence with its dimensions (collecting and analyzing the data, flexibility, and risk support) in making strategic decisions in Gaziantep city.

Moreover, the findings of this study agreed with Niu et al (2021) study, which revealed high relative importance and that the suggested method in (ODM-BDA) study contains an accuracy rate of (96.1%), a low error rate that accounts for (0.66%), efficiency rate (97.2%), accuracy rate (96.3%), true positive rate (80.6%), and delay ratio less than (52.8%) in China.

2. The findings of the first hypothesis show that "there is a statistically significant differences at the significance level ($\alpha \leq 0.05$) for business intelligence with its dimensions (data sources, data storage, data processing and analysis, data presentation, business perform management) on decision-making with its dimensions; including, diagnosing problems, developing alternatives, evaluating alternatives, selecting the best alternative, decision implement and follow-up at Jordanian commercial banks.

3. The findings of the second hypothesis showed "a statistically significant impact at the significance level ($\alpha \leq 0.05$) for information security in improving the effect of business intelligence dimensions on decision making with its dimensions at Jordanian commercial banks".

The first and the second hypotheses of this study agreed with Al Eid and Yavuz (2022) study, which concluded that there is a strong positive relationship between business intelligence and decision- making systems with making strategic decisions in Syrian civil societies in Gaziantep city.

Moreover, it is commensurate with Jawa (2021) study which concluded that using business intelligence systems has positive impact on the effectiveness of making decisions in the general organizations for social insurance in Jeddah city.

The findings are further concord with Sadaqa (2020) study, which concluded that there is an impact of business intelligence with its dimensions; including, data integrations, business intelligence interaction, transparency, analytical and smart decision support on the quality of data, and that there is an impact of business intelligences on the quality of decisions in telecommunication companies in Jordan.

Recommendations

1-To continue supporting business intelligence at Jordanian commercial banks to achieve best decisions and due to its importance in leading the stages of decision-making.

2. To improve the applying of the processes of decision-making by its sub-processes; including, collecting, storing, and analyzing at Jordanian commercial banks to play its role in taking the best decisions and finding appropriate solutions and alternatives.

3. Raising the level of sourcing processes and data collection for the workers at Jordanian commercial banks to improve information and to enhance the abilities of making the right decisions.

4. Finding specialized units for applying business intelligence processes among Jordanian commercial banks within clear channels to achieve the utmost benefit in all the stages of decision-making.

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