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Analysis of the Impact of Applying Business Intelligence Techniques in Improving Organizational Performance: The Mediating Role of Decision Support Systems

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Abstract

The problem of the study is to identify the mediating role of decision support systems in analyzing the impact of applying business intelligence techniques in improving organizational performance in Jordanian telecommunications companies. The study utilized a descriptive approach to gather data, test hypotheses, and address research questions about the current state of the study subject. The population of this study is Jordanian telecommunications companies in the capital, Amman. The questionnaire retrieved 277 valid responses. The results showed that there is a mediating role for decision support systems in the effect of business intelligence techniques in improving organizational performance. The study recommended a number of recommendations, including that Jordanian telecommunications companies must formulate a comprehensive information technology strategy that includes business intelligence methodologies and decision support techniques. The strategy should include a distinct long-term goal and a precise action plan to implement and use these technologies efficiently. However, Jordanian telecom companies will gain advantages by using business intelligence tools to analyze many aspects of their operations.

Keywords: Business Intelligence Techniques, Organizational Performance, Decision Support Systems, Jordan, Telecommunications Companies.

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Introduction

Today, organizations have made significant investments in business intelligence (BI) systems due to the growing importance of information intelligence for managers and their business environment (Caserio et al., 2018). Business Intelligence (BI) is specifically created to visually represent an organization's information assets. Its purpose is to provide a comprehensive picture of business dynamics and facilitate informed decision-making by gathering information from various sources (Ahmed et al., 2019). An overarching theme that has emerged in the research is that Business Intelligence (BI), as a broad term, encompasses a range of technologies such as data warehouses, data mining, on-line analytical processing (OLAP), decision support systems (DS), balanced scorecard, and others (Żółtowski, 2022; Maaitah, 2023). These technologies are used to enhance work-flows and the decision-making process.

The primary purpose of a Business Intelligence (BI) system is to provide decision makers (DM's) with the necessary information at both the tactical and strategic levels (Yerpude, 2023). This information enables DM's to comprehend, oversee, and synchronize the activities and processes within businesses (Wachaga, 2019). Essentially, all of these functions aim to offer users satisfactory support in the process of making decisions. Similarly, the academic literature has identified multiple advantages of organizational data science. Based on this premise, Business Intelligence (BI) is considered one of the foremost fields in information technology and has been given high importance by many leaders (Khan, 2022). Currently, a

wide range of technologies are employed by organizations as tools to assist in decision-making. However, it would be beneficial to find the most suitable option by evaluating the desired advantages in each decision scenario, in order to achieve specific outcomes (Lokeshkumar et al., 2018).

Business intelligence plays a crucial role in the telecommunications industry by providing essential tools and insights that enable companies to outperform their rivals and achieve a competitive edge. Currently, there is a deficiency in discovering a structured framework that an organization can employ to emphasize the importance of Business Intelligence (Al-Zadjali & Al-Busaidi, 2018). According to the above, the problem of the study is to identify the mediating role of decision support systems in analyzing the impact of applying business intelligence techniques in improving organizational performance in Jordanian telecommunications companies.

Literature review

Business Intelligence

In 1989, Howard Dresner, an analyst at Gartner Group, introduced the phrase "business intelligence" as a comprehensive label for the ideas and techniques aimed at enhancing business decision-making through the use of evidence-based support systems (Mutanga, 2016). The utilization of it was not prevalent until the latter part of the 1990s. Business intelligence can be comprehended in a straightforward manner (Yafooz et al., 2020). However, the utilization of technology involves the application of precise, up-to-date information of significant quality pertaining to the specific field of work (Caserio et al., 2018). This information is obtained from multiple reliable sources and is used to enhance decision-making processes by leveraging past experiences and striving for continuous improvement and development (Božič & Dimovski, 2019).

Business intelligence is crucial for comprehending the current state of the work environment, which is marked by fierce competition and increasing complexity due to rapid changes (Mohammed et al., 2024). It involves ongoing real-time monitoring to anticipate future trends and identify investment opportunities or potential risks (Caserio et al., 2018). The goal is to enhance the business organization's position within the competitive landscape or, at the very least, maintain its competitiveness. Business intelligence enhances decision-making within an organization by facilitating the analysis of different aspects of the business. It collects information on areas such as marketing, warehousing, customer relationships, and analyzes customer behavior and job satisfaction. Additionally, it furnishes the company with the fundamental basis upon which it can initiate a fresh phase of operations, as well as anticipate the diverse alterations and advancements that may transpire.

Organizational Performance

Manzoor (2012) pointed out some strategic elements that can contribute to improving the performance of organizations: It is necessary to define what the organization is, determine its mission, in addition to studying the various alternatives for resources, defining clear goals derived from the organization’s mission, and setting priorities (Pathiranage, 2019), in order to define the standards of achievement, performance, and results. Performance measures must be determined, such as the extent of beneficiaries’ satisfaction with the services provided (Angelakoglou et al., 2019). These metrics must be used to provide feedback on the efforts made within the organization. Finally, there must be a regular review of performance and results in order to adjust goals if necessary, and to modify unsatisfactory performance and unproductive activities (Omene, 2021). This helps in developing a new mechanism that contributes to improving performance.

Decision Support Systems

The decision support system simply focuses on providing appropriate support to improve the quality and suitability of the available information, the adequacy of the available information and the number of alternatives proposed (Zhai et al., 2020), as well as the suitability of the models used to analyze the problem, all at a specific point in time during decision making. Decision support systems are

comprehensive systems that collect vital information using computers, information technology (Ranasinghe et al., 2022), and operations research, with the goal of assisting senior management in organizing its work and making suitable decisions at the correct time (Govindan et al., 2020). The use of computerized decision support systems is important because it aids in the rapid and low-cost implementation of many mathematical operations, improves communication and cooperation, increases productivity for group members, improves information management, and improves the quality of the decision-making process (Felsberger et al., 2016). As a result, the information generated by information systems must meet high-quality conditions and features in order to be relied on while making choices or carrying out any operations or activities within the facility (Yazdani et al., 2017).

Hypotheses development

The advancement of artificial intelligence (AI) technology has broadened the scope of corporate operations, leading to the introduction and utilization of business intelligence (BI). This has facilitated the optimization of business decision-making and operations through the transformation of information approaches (Chen & Lin, 2017). Furthermore, Abusweilem & Abualoush (2019) come to the conclusion that the components of business intelligence have a favorable impact on the performance of enterprises. When it comes to the performance of the organization, Bhatiasevi & Naglis (2020) state that the implementation of business intelligence had a beneficial impact on the internal processes, as well as learning and growth throughout the firm. According to Alzghoul et al. (2024), the capability of business intelligence (BI) has been identified as a game-changer due to the enormous impact it has on the performance of the company. BI capacity has an indirect impact on the performance of the company by influencing the speed and comprehensiveness of decision-making. According to the above, the following hypothesis can be reached:

H1: There is a positive role for business intelligence techniques in improving organizational performance.

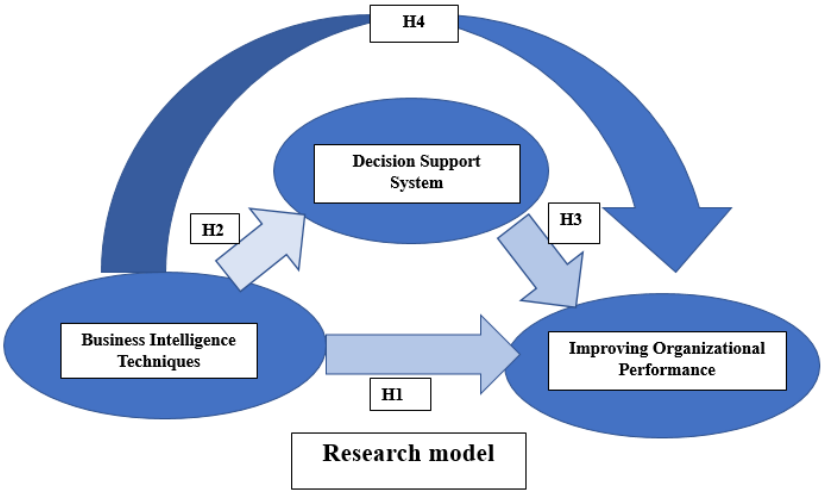
Prem & Karnan (2013) determined business intelligence as a comprehensive range of applications and technologies that are used to collect, provide access to, and analyze data. The ultimate goal is to assist enterprise users in making more effective and efficient business choices. Malkawi (2018) turned out to the conclusion that the decision-making process is also significantly impacted by the presence of decision support systems and business intelligence. In their study, Alasiri and Salameh (2020) demonstrated that the implementation of a Business Intelligence (BI) system can have a positive impact on the Decision Support System (DSS). By collecting a large volume of data, the BI system enables the DSS to make informed decisions. Additionally, the DSS contributes to the organization's performance by enhancing organizational control, personal efficiency, and the effectiveness of problem-solving. Consequently, this will impact the organization by enabling the implementation of the most suitable and precise option, thereby influencing the institution's job performance. According to the above, the following hypothesis can be reached:

H2: There is a positive role for business intelligence techniques in decision support systems.

Attadjei et al. (2018) suggested that an efficient and robust shop network management leads to a well-functioning firm, high-quality products or services, and increased customer trust and corporate profits. In order to reach this stage in a company's growth, it is crucial to make the most optimal decisions that will lead in the right direction. These choices are typically consequences of previous experiences and external information that have been integrated to provide data or knowledge. Alhawamdeh & Alsmairat (2019) stated that the strategic decision-making process significantly contributes to the organization's successful performance, based on their analysis of the literature and prior studies. The studies also demonstrated the influence of both internal and external environmental factors on managers' ability `to make strategic decisions. Additionally, the utilization of decision support systems assists decision-makers in accessing timely information, thereby enhancing the performance of strategic decisions and directly impacting the organization's overall performance. According to Hadidi et al. (2020), the information age, rapid information dissemination, and increased data flow have all contributed to an increase in the competitive

environment among organizations. As a result, the utilization of decision support systems has become increasingly important for businesses in order to enhance their capacity to adapt to the environment by relying on the Internet-based support systems to make appropriate decisions. According to the above, the following hypotheses can be reached:

H3: There is a positive role for decision support systems in improving organizational performance.
H4: There is a mediating role for decision support systems in the effect of business intelligence techniques in improving organizational performance.



Research model

Research Methodology

The study utilized a descriptive approach to gather data, test hypotheses, and address research questions about the current state of the study subject. The analytical descriptive method was employed to evaluate the target population, encompassing attitudes, and demographic information. In addition, this approach aimed at hypothesis testing was conducted to determine the impact of the proposed factors. The hypotheses in this study were derived from the research objectives and aimed to examine the mediating role of decision support systems in the improving impact of applying business intelligence techniques in improving organizational performance.

Population And Sample Study

The population of this study is Jordanian telecommunications companies in the capital, Amman. that use business intelligence technology within their operations. For this reason, the study respondents were telecommunications company employees who work in various departments. Due to the difficulty of reaching and incorporating all study population employees, a convenience sampling technique was utilized. This approach enabled us to acquire the necessary data while ensuring that it accurately represented the entire population. Therefore, a self-administered questionnaire was developed using the Google Forms platform for data collection. The link to this questionnaire was distributed among the respondents after acquiring telecommunications company approval to participate in this study. Those companies are Zain, Orange and Umniah. Sample size is an essential element of research design and greatly affects the validity of study results. Sample size calculation is necessary to ensure adequate sample size and avoid Type II errors. a calculation was performed taking into account a margin of error of 5%, and a confidence level of 95%. (Sekaran and Boje, 2019). The questionnaire retrieved 277 valid responses.

Questionnaire Design

The questionnaire used in this study is divided into two main parts: Part One focuses on gathering demographic information from the study sample members, including Age, gender, Academic Qualification, work experience, and organizational level. Part Two contains paragraphs or questions related to the study variables. **The independent variable " Applying Business Intelligence Techniques (BIT) "** consists of

10 items, and **the dependent variable " Improving Organizational Performance (IOP)"** consists of 6 items Additionally, **the mediator variable " Decision Support Systems (DSS)"** includes 6 items.

To measure these variables, the researcher utilized a Seven-point Likert scale, which allows respondents to express their perceptions. The scale ranges from 7 (strongly agree) to 1 (strongly disagree). (Sekaran & Bougie, 2016).

Statistical methods

To answer the study's questions and test its hypotheses, Statistical Packages for Social Sciences (SPSS) version 25 was used to perform descriptive analysis, and (AMOS) program was used to analyze the mediator variable and test the hypotheses by using the following statistical methods:

Explanatory Factor Analysis (EFA) to attain the validity of the content.

Consistency Coefficient (Cronbach Alpha) to test the reliability of the study instrument.

Descriptive statistics to find the mean, Frequency, and Standard deviation and measure the sample members' perception of the study.

Using the AMOS program including structural equation modeling (SEM) to analyze the mediating role of the variable Information Sharing. practices on the impact of Information Quality. on Supply Chain Performance.

Significance level (α): (0.05) was adopted as an upper bound for the significance level and accordingly if it was a level of Significance (0.05) or less indicates that there is a statistically significant effect, but if the level of significance is greater than (0.05), there is no statistically significant effect.

The calculated value: The calculated value was relied upon as another rule for rejecting or accepting the hypotheses so that if the calculated value is greater than its tabular value, this indicates the acceptance of the null hypothesis (H_0) and if the calculated value is less than the tabular value, we reject the null hypothesis (H_0).

Normality test

According to a test of normality at the AMOS program all values Skewness values between (- 0.914 - - 0.67) do not reach (- + 1), and kurtosis values between (1.585 - - 0.04) do not reach (- + 3). which means our data follow the normal distribution.

Validity Test

To ensure the validity of the research instrument, three approaches were employed: content validity, face validity, and construct validity. Content validity was established by gathering data from diverse literary sources, including books, journals, and research papers, relevant to the study topic. This comprehensive review helped to determine the adequacy and relevance of the instrument's content. Additionally, face validity was assessed through the use of questionnaires to ascertain the clarity and comprehensibility of the research instrument.

Explanatory Factor Analysis (EFA)

In this study, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy should be higher than 0.60, and Bartlett's test of sphericity should be consistently significant at $p < 0.05$ (Hair et al., 2014).

PCA with Varimax Rotation was performed for all items under each structure that constitute the basic variables of the study. The value of KMO is (0.912, 0.872,0.839) for (Applying **Business Intelligence Techniques**, **Improving Organizational Performance**, and **Decision Support Systems**) respectively. And Bartlett's Test of Sphericity P value (0.00) for all variable

Applying Business Intelligence Techniques

PCA with Varimax Rotation extracted a distinct dimension with an eigenvalue exceeding one and explained the total variance of 62.871, and cumulative variance of 74.964 which exceeds 50%, which is the minimum acceptable level of Hair et al. (2012) and other sources accepted at 30%.

Next, the component matrix of **Applying Business Intelligence Techniques** loaded on one component, all the items were retained because the values of the factor loading ranged from 0.884 and 0.729. As a rule of thumb indicated by Tabachnick and Fidell (2013), loading above 0.50 is excellent.

Improving Organizational Performance

PCA with Varimax Rotation extracted a distinct dimension with an eigenvalue exceeding one and explained the total variance of 64.579 which exceeds 50%, which is the minimum acceptable level of Hair et al. (2012).

Next, the component matrix of the **Improving Organizational Performance** one component, all the items were retained because the values of the factor loading ranged from 0.863 and 0.750. As a rule of thumb indicated by Tabachnick and Fidell (2013), loading above 0.50 is excellent.

Decision Support Systems

PCA with Varimax Rotation extracted a distinct dimension with an eigenvalue exceeding one and explained the total variance of 58.030 which exceeds 50%, which is the minimum acceptable level of Hair et al. (2012).

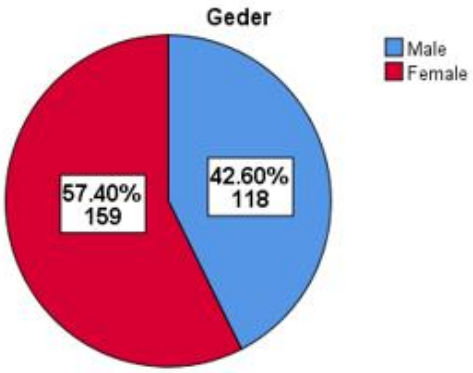
Next, the component matrix of **Decision Support Systems** loaded on one component, all the items were retained because the values of the factor loading ranged from 0.829 and 0.639. As a rule of thumb indicated by Tabachnick and Fidell (2013), loading above 0.50 is excellent.

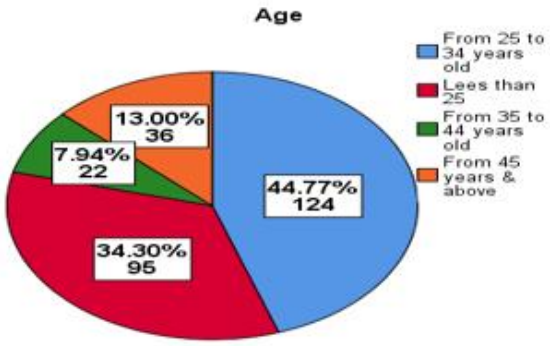
Reliability Test

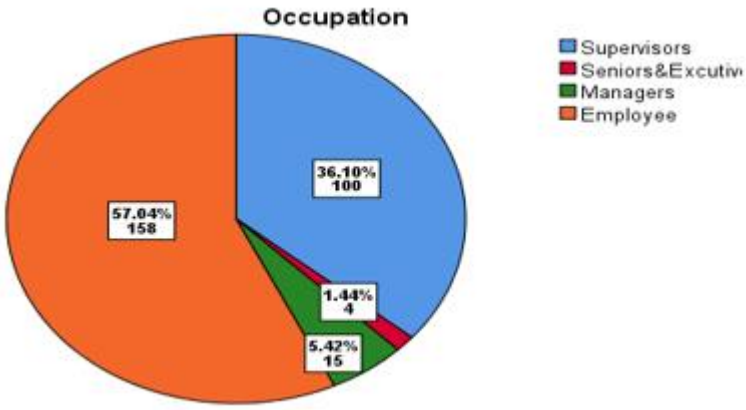
The study reliability of the instrument was carried out by calculating the value of Cronbach's alpha. The value should be greater than 0.60 to be statistically acceptable. (Sekaran & Bougie, 2016) During the study, the overall result of Cronbach Alpha was **94.2%**, and (0.934,0.889,0.854) for (Applying Business Intelligence Techniques, Improving Organizational Performance, and Decision Support Systems) respectively.

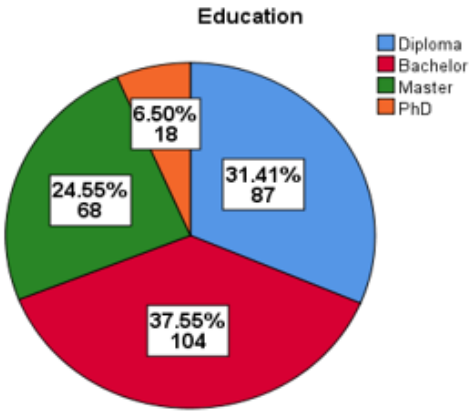
Respondent profile

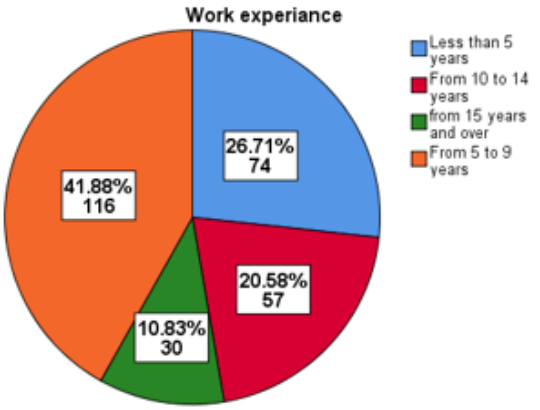
The questionnaire retrieved 277 valid responses, and after performing a descriptive analysis using the Statistical Package for the Social Sciences (SPSS), the demographic characteristics of the respondents were as follows: 57.4% % male and 42.6 % female. According to age, approximately half of the respondents' ages ranged between 25 to 34 years old reaching 44.77%. The majority of them 37.55 %, hold a bachelor's degree or equivalent and have more than five years of experience in the banking sector, with 41.88 % ranging between 5 to 9 years. Finally, as per their job position or organizational level, half of the respondents were employees 57.04 %, and supervisors 36.10%, 5.42 % were managers, and 1.44 % were seniors and executive


Geder
Male
Female
42.60%
118
57.40%
159


Age
From 25 to 34 years old
Lees than 25
From 35 to 44 years old
From 45 years & above
13.00%
36
7.94%
22
44.77%
124
34.30%
95


Occupation
Supervisors
Seniors&Excutiv
Managers
Employee
36.10%
100
57.04%
158
1.44%
4
5.42%
15


Education
Diploma
Bachelor
Master
PhD
6.50%
18
31.41%
87
24.55%
68
37.55%
104


Work experiance
Less than 5 years
From 10 to 14 years
from 15 years and over
From 5 to 9 years
26.71%
74
41.88%
116
20.58%
57
10.83%
30

Descriptive analysis of the study data

The descriptive statistics for the independent variables (Applying Business Intelligence Techniques).

To accurately display the search results, the standard deviation and mean of each variable were calculated as follows:

Table (1): Mean, Standard Deviation, Order, and Importance of Applying Business Intelligence Techniques

Statement	Mean	Std. Deviation	Rank	Important
do you find data mining is effective in identifying trends and patterns?	5.66	.851	2	High
Do you feel that Business Intelligence tools can help in forecasting future trends?	5.69	.899	1	High
Using dashboard reporting leads to an effective decision-making process	5.46	.949	6	High
Can data visualization be useful in displaying complex data?	5.52	.915	3	High
Do you think that data visualization tools increase work productivity in your organization?	5.37	.983	8	High
Do you believe data mining is important in driving business decisions at your organization?	5.32	1.054	9	High
Are you satisfied with the current dashboard reporting system at the bank?	5.49	.862	4	High
Do you think is real-time data analysis important for the bank's operations?	5.42	.892	5	High
do you think the current dashboard reports communicate information effectively?	5.39	.888	7	High
Do you receive regular training on using dashboard reporting tools?	5.31	.891	10	High
Applying Business Intelligence Techniques	5.47	.735		

Table (1) shows the descriptive data where it can be seen that the **independent variable Applying Business Intelligence Techniques** has high importance with mean and its value (5.47) and standard deviation (0.735) The sentence came first: “Do you feel that business intelligence tools can help predict future trends?” The highest average (5.69) and a standard deviation (0.899). In last place is the sentence “Do you receive regular training on using dashboard reporting tools?” with an average (5.31) and a standard deviation (0.891).

The descriptive statistics for the dependent variable (Improving Organizational Performance IOP)

Table (2): Mean, Standard Deviation, Order, and Importance of the dependent variable IOP

Statement	Mean	Std. Deviation	Rank	Important
Are you satisfied with the overall productivity of your team or department?	5.75	.679	6	High
In your opinion, does absence affect the overall performance of the team?	5.76	.791	4	High
Employees engage in organizational citizenship behavior (OCB) (e.g., helping co-workers, volunteering for extra tasks).	5.82	.741	2	High
Is the violation of rules (for example, rule violations and unethical behavior) among team members enhancing work productivity?	5.81	.704	3	High
How much do you agree with the current turnover rate within your organization?	5.76	.718	4	High
Do you believe that implementing Business Intelligence techniques can improve organizational performance?	5.92	.682	1	High
IOP	5.80	.577		High

Table (2) shows the descriptive data where it can be seen that the **dependent variable Improving Organizational Performance IOP** has high importance with mean and its value (5.80) and standard deviation (0.577) The sentence came first: "Do you believe that implementing Business Intelligence techniques can improve organizational performance?" The highest average (5.92) and a standard deviation (0.682). In last place is the sentence "Are you satisfied with the overall productivity of your team or department?" with an average (5.75) and a standard deviation (0.967)

The descriptive statistics for the Mediator variable (*Decision Support Systems DSS*).

Table (3): Mean, Standard Deviation, Order, and Importance of *the Mediator variable DSS*

Statement	Mean	Std. Deviation	Rank	Important
Do you think Decision Support Systems can improve collaboration among different departments?	5.54	0.769	5	High
Do you believe that Decision Support Systems can help in aligning organizational goals with strategic objectives?	5.75	0.706	1	High
Do you think Decision Support Systems can help in risk management?	5.59	0.759	3	High
Do you think Decision Support Systems can enhance data-driven decision-making?	5.59	0.746	3	High
Do you believe that Decision Support Systems can enhance customer satisfaction?	5.67	0.755	2	High
Do you think that decision support systems play a role in facilitating the use of business intelligence techniques in your organization?	5.50	0.751	6	High

DSS	5.607	0.568		High

Table (3) shows the descriptive data where it can be seen that the **Mediator Variable Decision Support Systems DSS** has high importance with mean and its value (5.607) and standard deviation (0.568) The sentence came first: "Do you believe that Decision Support Systems can help in aligning organizational goals with strategic objectives?" The highest average (5.75) and a standard deviation (0.706). In last place is the sentence "Do you think that decision support systems play a role in facilitating the use of business intelligence techniques in your organization?" with an average (5.50) and a standard deviation (0.751)

Data analysis and result

According to Awang (2015), all items that have factor loading less than 0.60 should be deleted to get a fit model and test the research hypothesis. Figure (2) presents factors loading for the questionnaire item after confirmatory factor analysis. All the items shown have factor loading higher than 0.60 and achieve the required level.

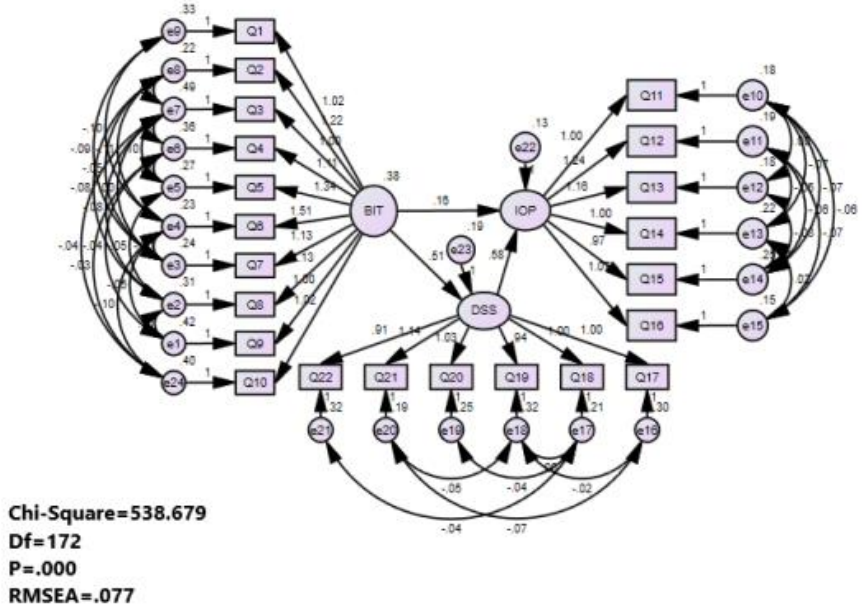


Figure (2): the regression path coefficient

Table (4): Goodness of Fit Indices for Measurement Model

V.	**AGFI (Adjusted Goodness of Fit)**	**X^2/df**	**GFI (Goodness of Fit)**	**RAMSEA (Root mean square error of approximation)**	**CFI (Comparative Fit Index)**	**NFI (Normed fit index)**	**IFI**	**TLI**
Value Recommended	> 0.8	< 5	> 0.90	≤0.08	> 0.9	> 0.9	> 0.9	> 0.9
References	(Miles and	(Tabachnick and	(Miles and	(MacCallum et al, 1996)	(Hu and Bentler,	(Hu and	(Hu and	(Hu and

	Shevlin, 1998).	Fidell, 2007)	Shevlin, 1998).		1999).	Bentler, 1999).	Bentler, 1999).	Bentler, 1999).
Value of Model	**(0.844)**	**(3.13)**	**(0.910)**	**(0.077)**	**(0.939)**	**(0.919)**	**(0.919)**	**(0.930)**

Fitness indexes appear in Figure (2) the measurement model is fit. While p-vale is 0.000. table (4) shows that RMSEA is less than 0.080 (0.077), CFI is higher than 0.90 (0.939), and ChiSq/df is less than 5 (3.13).

Test the research hypothesis

Table (5): Regression Wight

Hypothesis	**Regression weights from**	**To**	**Estimate**	**SE**	**CR**	***P***	**Result**
H_{o1}	BIT	IOP	0.164	0.050	3.270	0.006	***Significant***
H_{o2}	BIT	DSS	0.515	0.061	8.398	0.007	***Significant***
H_{o3}	DSS	IOP	0.577	0.078	7.427	0.019	***Significant***

Besides, Table (3) shows that the positive direct effect *P*-value (BIT → IOP) of 0.006 is significant, the positive direct effect *P*-value (BIT → DSS) of 0.007, and the positive direct effect *P*-value (DSS → IOP) of 0.019. According to Awang (2014), if the CR less than +/-1.96 the hypothesis will have supported. Table (5) presents all CRs less than 1.96 and p-vale is significant. So there is a positive impact of each of Applying Business Intelligence Techniques and Decision Support Systems in Improving Organizational Performance at a significant level ($P \leq 0.05$).

Fourth Hypothesis

shows the results of the structural equation modeling (SEM) of the impact of Applying Business Intelligence Techniques in Improving Organizational Performance in the presence of Decision Support Systems as a Mediator variable, where the results of this statistical analysis showed a statistically significant Applying Business Intelligence Techniques in Improving Organizational Performance in the presence of Decision Support Systems.

The values of the direct and indirect impact of the relationship of mediation variable (Decision Support Systems) on the relationship between Applying Business Intelligence Techniques and Improving Organizational Performance are significant, as the value of the direct impact of Applying Business Intelligence Techniques on Improving Organizational Performance reached (0.164), which indicates positive impact The Applying Business Intelligence Techniques effects on Improving Organizational Performance, the direct impact of the Applying Business Intelligence Techniques on Decision Support Systems (0.515), This indicates that Applying Business Intelligence Techniques has a positive impact on the decision support systems. the direct impact of decision support systems on improving organizational performance (0.577) indicates that the decision support systems effects on improving organizational performance.

These effects have been expressed using standard values, where it is noticed that the effect of (the coefficients) relationship of the median in the function was statistically significant because it is less than .05, which means that there is an indirect effect of the mediating variable statistically amounting to (0. 0.297). Therefore, the total impact of the independent variable (Applying Business Intelligence

Techniques) on the dependent variable (Improving Organizational Performance) with the presence of the mediator (Decision Support Systems) became (0.461). **the mediation is partial**, where (0.297*100/0.461) =64.42. according to (Hair, et al., 2014), <20% no mediation, 20% - 80% partial mediation and >80% full mediation.

Discussion

The results showed that there is a positive role for business intelligence techniques in improving organizational performance. This finding has been supported by a number of studies, with Chen & Lin, 2017 (2017) finding that advances in (AI) technology have expanded the scope of companies' operations, leading to the introduction and use of (BI). This has facilitated improved decision-making and business processes by transforming information approaches. Moreover, Abusweilem & Abualoush (2019) and Bhatiasevi & Naglis (2020) come to the conclusion that BI components have a positive impact on the performance of organizations. The results showed that there is a positive role for business intelligence techniques in decision support systems. Prem & Karnan (2013) indicated that the ultimate goal is to help corporate users make better business decisions. Malkawi (2018) found that decision support systems and corporate intelligence affect decision-making. Alasiri and Salameh (2020) showed that a Business Intelligence (BI) system can improve the Decision Support System. The results showed that there is a positive role for decision support systems in improving organizational performance. Based on literature and earlier studies, Alhawamdeh & Alsmairat (2019) concluded that strategic decision-making greatly impacts the organization's success. Decision support systems also help decision-makers obtain timely information, improving strategic decisions and the organization's performance. According to Hadidi et al. (2020), the information era, rapid information transmission, and increasing data flow have enhanced organizational competition. In order to adapt to the environment, organizations are increasingly using Internet-based decision support systems to make suitable judgments. Finally, the results showed that there is a mediating role for decision support systems in the effect of business intelligence techniques in improving organizational performance.

Conclusion

Studying the effects of using business intelligence approaches to improve organizational performance, along with the role of decision support systems, can enhance the performance of Jordanian Telecommunications companies. These technologies facilitate the enhancement of decision-making and data analysis, augment corporate insight and customer experience, and bolster innovation and competitiveness in the market. Jordanian telecommunications businesses should increase awareness of the significance of business intelligence techniques and provide comprehensive training to staff to ensure their efficient utilization. Organizing workshops and training courses can enhance comprehension and proficiency in this field. Specifically, business intelligence techniques must align with the organizational structure and existing operations of the company. It is essential to establish integration between decision support systems and other enterprise systems to provide seamless information and data flow. It is crucial for Jordanian telecommunications businesses to dedicate the required resources to efficiently implement business intelligence approaches. These resources may necessitate the utilization of teams who are specialized in data analysis, the creation of decision support systems, and the construction of technology infrastructure. Integrating firm data into decision-making processes is essential. Decision support systems should be designed to efficiently extract crucial data and transform it into meaningful information, enabling the making of well-informed strategic decisions. The study's findings lead to the following recommendations: Jordanian telecommunications firms ought to formulate a comprehensive information technology strategy that encompasses business intelligence methodologies and decision support technologies. The strategy must encompass a distinct long-term goal and a precise action plan to proficiently implement and utilize these technologies. However, Jordanian telecoms businesses stand to gain advantages by utilizing business intelligence tools to analyze many facets of their operations. These methodologies can be employed to scrutinize financial data, customers, internal operations, and market trends. Business intelligence approaches can also aid in predictive analysis, enabling the anticipation of future trends and the identification of possibilities and difficulties. Jordanian telecommunications firms

should employ modeling and forecasting methodologies to attain precise predictions and enhance their strategic decision-making.

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