THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

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THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

Abstract:

The research aimed to find the level of business intelligence implementation at Al-Balqa' Applied University from the perspective of administrative leaders, detect the challenges facing its implementation and propose solutions to enhance the level of business intelligence implementation and overcome those challenges. To achieve the study's objectives, quantitative approach has been adopted. For data collection purposes, a questionnaire was designed and distributed electronically to a sample of 90 administrative leaders working at Al-Balqa' Applied University. The number of valid questionnaires for analysis was 75. The results indicated a high level of business intelligence implementation at the university. The results indicated that financial and training challenges, as well as the lack of infrastructure, were among the most significant challenges to implementing business intelligence at the university. The results emphasized the need to leverage the experiences of other countries and universities in employing business intelligence in the workplace, and to provide employees with training courses that enhance their skills in dealing with business intelligence technologies, in addition to improving infrastructure and allocating the necessary financial resources to achieve this.

key words: Business Intelligence, Challenges, Solutions, Leaders, Jordan.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

Introduction:

The technological revolution the world is witnessing has contributed to numerous changes affecting individuals and organizations alike. These changes have necessitated digital transformation by relying on an infrastructure based on technology, information, and a set of communication networks.

Al-Ghamdi and Aqili (2022) argued that many contemporary organizations of various types face fears of change, a lack of information systems, and a lack of ability to keep pace with rapid transformations and developments. This has necessitated the emergence of numerous approaches that have become capable of strongly influencing an organization's success or failure.

Business intelligence (BI) is one of the most prominent approaches that has gained significant traction in various industrial, economic, health, and educational fields, due to the numerous advantages it offers to organizations, including academic institutions (Mortezaei et al., 2022). This approach relies on a set of methodologies and practices that enhance the organization's ability to confront surrounding challenges and changes. Al-Harthi and Al-Khathlan (2022) also indicated that academic institutions are turning to BI to develop the educational process and teaching staff, achieve the required quality in performance outcomes, and remain within the competitive environment.

With the increasing number of universities in Jordan, the intensification of competition among them, and the desire of each university to develop its educational, administrative, and financial processes; universities are now targeting the development of their information systems and the methods they rely on through these systems. Alamr (2018) stressed that, given the important role played by the university education sector in Jordan as one of the most important educational sectors directly impacting the Jordanian economy and societal renaissance, and also as one of the sectors most in need of keeping pace with contemporary developments, especially in light of the digital transformation and global technological advancements, It is imperative for this sector, with its various academic and educational institutions, to pay attention to the level of business intelligence implementation, identify the challenges facing this application, and seek solutions that can help overcome these challenges and support its application at the university level. This will help achieve the required sustainability in performance and enhance competitiveness in the contemporary environment. Accordingly, the current research aims find the level of business intelligence implementation at Al-Balqa' Applied University from the perspective of administrative leaders, detect the challenges facing its implementation and propose solutions to enhance the level of business intelligence implementation and overcome those challenges.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

RESWARCH PROBLEM AND QUESTIONS

The great similarity in services provided by universities, the tremendous technological development and constant changes in the surrounding work environment, in addition to the multiplicity of competitive methods, place them in fierce competition and an urgent need to move quickly within the competitive work environment and seize development opportunities that contribute to strengthening the organization's competitive position. Many organizations have realized that the tools they use to manage their operations are no longer effective in light of the intense competition among institutions at the local and global levels. This has prompted them to seek new methods that enhance their ability to achieve their goals (Alamr, 2018). Al-Ghamdi and Aqili (2022) indicated that business intelligence is one of the most prominent methods that has emerged at the level of academic institutions, as it contributes to raising the level of the institution to a better and more competitive level compared to other institutions.

Business organizations have realized the need to deal with the changing competitive environment in a way that enables them to overcome threats and capitalize on available opportunities. Accordingly, the shift towards business intelligence has become one of the most important features of business in the contemporary world, as it enables organizations to adapt or change their strategies in a way that enables them to respond to environmental changes with high efficiency. However, despite the great importance of business intelligence in the contemporary business environment; previous studies have demonstrated that this concept has not received sufficient attention from decision-makers in various sectors, and with little information available on how business intelligence contributes to business development (Gauzelin and Bentz, 2017; AlOtoom, 2020; Tripathi et al., 2024).

Moreover, the implementation of business intelligence faces many challenges, including financial challenges in terms of limited financial resources (Rahman et al., 2016), training challenges and lack of expertise among data management staff (Rahman et al., 2020; Tripathi et al., 2024), and a weak infrastructure capable of accommodating business intelligence processes (Nayyar, 2023; Tripathi et al., 2024). Based on that, the problem of the research can be summarized in the following research questions :

1. What is the level of business intelligence implementation at Al-Balqa' Applied University from the perspective of administrative leaders?
2. What are the challenges facing the implementation of business intelligence at Al-Balqa' Applied University from the perspective of administrative leaders?
3. What are the proposed solutions to enhance the level of business intelligence implementation and overcome the challenges facing its implementation at Al-Balqa' Applied University from the perspective of administrative leaders?

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

RESEARCH IMPORTANCE

The importance of the research stems from the importance of the variable it highlights, which is business intelligence. Business intelligence is considered one of the variables that represent the key to success in a changing business environment, directly linked to leveraging available opportunities within a business environment characterized by turmoil and constant change. Business intelligence enhances organizations' ability to effectively confront and respond to disruptions. Numerous studies have confirmed that organizations that utilize business intelligence are better able to respond to environmental changes and transform threats into opportunities (Ghasemaghaei et al., 2017; Mortezaei et al., 2022; AL-Hanandeh, 2020). Business intelligence also enhances the organization's absorptive capacity and support knowledge generation, thereby contributing to improved performance and maintaining the organization's competitive position (Zhao, 2021; Khan et al., 2022).

Moreover, this research contributes to providing a comprehensive and broad understanding of business intelligence in Jordanian universities and clarifying the challenges facing its implementation. This helps administrative leaders take the necessary measures and administrative policies to overcome and mitigate these challenges. This will contribute to expand the scope of business intelligence application and utilize it positively to achieve the desired developmental effectiveness in the long term. The importance of the research also stems from the potential for other researchers to benefit from the findings of the research, conducting further research and future studies in the field of business intelligence and linking them to other variables that will positively impact the development of service and educational organizations in particular.

Furthermore, this research also targets one of the most prominent and important sectors in Jordan: the university education sector, which is characterized by intense competition. Various universities operate under intense competition and numerous environmental changes, which compels them to seek modern and advanced operational strategies capable of enhancing their competitiveness in the business world, including the business intelligence

RESEARCH LIMITATION

This research aimed to explore the reality of business intelligence implementation in Jordanian universities, specifically at Al-Balqa' Applied University, and to identify the challenges facing implementation and the solutions that can be offered to enhance implementation and overcome these challenges.

The study was limited to administrative leaders working at Al-Balqa' Applied University, including department heads, their deputies, Deans, supervisors. The research was also conducted in 2025.

RESEARCH HYPOTHESIS

The research seeks to test the following hypothesis:

H1: Is there any Are there any statistically significant differences among the study sample's answers regarding the level of business intelligence implementation at Al-Balqa' Applied University attributed to gender, educational level, years' experience and position ?

H2: Is there any Are there any statistically significant differences among the study sample's answers regarding the challenges facing the implementation of business intelligence at Al-Balqa' Applied University attributed to gender, educational level, years' experience and position?

LITERATURE REVIEW

a. Business intelligence concept and importance

Business intelligence (BI) refers to all applications, activities, and technologies necessary to collect, analyze, and classify business data to support strategic decision-making. The term BI covers various technologies used to collect and store information to support decision-making (AL-Hanandeh, 2020). Al-Omari and Aqili (2020) indicated that BI helps access data, information, and business improvement methods. It also aims to enhance the process of analyzing big data and assist users in providing better business outcomes and making sound strategic decisions.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

Awamleh (2022) emphasized that the importance of BI lies in understanding, managing, and coordinating organizational processes. BI also contributes to providing business organizations with reports from various internal and external sources, leading to improved organizational decision-making. Al-Hajreh (2018) added that the importance of BI lies in its ability to increase profits, enhance competitive advantage, improve business performance, enhance market viability, and enable sound decision-making.

b. Business intelligence implementation

Most countries today seek to transition from traditional economic models to modern economic models based on knowledge, learning, and continuity. To achieve this, a range of modern technologies are being utilized, where business intelligence being one of the most prominent, given the significant changes it has brought about across various sectors (Awamleh, 2022). Al-Ghamdi and Aqili (2022) pointed out that the increasing volume of data and the significant growth in computing power have contributed to the emergence of numerous discoveries and new applications that enable modern data management.

There are many applications of business intelligence that can be utilized in the business world, including problem solving, overcoming current and future challenges, handling big data, analyzing and reporting on big data, developing strategic plans, reducing costs, and other applications. To uncover the level of business intelligence implementation, several studies have been conducted, including Al-Ghamdi and Aqili (2022), which found that administrative leaders at King Abdulaziz University confirm that business intelligence is effectively implemented within them, and that this application helps the university focus on governance, facilitate access to data and manage data effectively. Al-Hajreh (2018) also found that the application of business intelligence dimensions was moderate in Jordanian public universities.

Moreover, Al-Harthi and Al-Khathlan (2022) found a high level of business intelligence implementation at Prince Sattam bin Abdulaziz University, while Al-Omari and Aqili (2020) found an average level of business intelligence implementation from the perspective of administrative leaders at King Abdulaziz University. Awamleh's study (2022) also indicated a high level of business intelligence in Jordanian telecommunications companies across all dimensions.

c. Challenges and solutions

Many previous studies have indicated the existence of several challenges that hinder the implementation of business intelligence in the business environment and the effective utilization of its potential. Rahman et al. (2016) concluded that financial challenges and challenges related to the lack of experience and knowledge of employees in dealing with business intelligence are among the most prominent challenges affecting the level of

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

implementation. Yeoh and Koronios (2010) indicated that the successful implementation of business intelligence requires attention to technological and administrative elements, as management must assume responsibility for providing the necessary support for the effective implementation of business intelligence in the business environment. Tripathi et al. (2024) indicated that the most prominent challenges organizations face when implementing business intelligence are the lack of a qualified workforce, the inadequate infrastructure to effectively support business intelligence implementation, and the weak technical capabilities to overcome technical issues. Moreover, Nayyar (2023) concluded that weak organizational management capabilities, the need for an infrastructure equipped and prepared to handle modern technologies, and the multiplicity of business intelligence capabilities and forms are among the most significant factors that increase the level of concerns in implementing business intelligence in the workplace.

Specifically, in universities, Al-Ghamdi and Aqili (2022) concluded that university leaders face a number of challenges in implementing business intelligence. These challenges are primarily represented by high material costs and the need for specialized human resources in the field (Al-Ghamdi and Aqili, 2022). Alamr (2018) also emphasized that technological challenges, appropriate infrastructure for implementing advanced systems, sufficient financial resources, and employee training and enhancing their technical skills are among the most prominent challenges facing employees when implementing business intelligence in Jordanian public universities.

In order to overcome the challenges facing management in implementing business intelligence and capitalizing on the potential offered by this system, García and Pinzón (2017); English and Hofmann (2018) and Chen and Lin (2023) stressed that indicated that defining a clear vision for the business, determining the appropriate time for implementation, ensuring the allocation of the necessary equipment and resources for effective implementation, and achieving completeness and balance in the change management process represent important means of overcoming implementation challenges.

Al-Ghamdi and Aqili (2022) added that one of the most prominent solutions that can be offered for the successful implementation of business intelligence in universities is to benefit from the experiences of countries and organizations in implementing business intelligence. This is in addition to the need to establish business intelligence centers in universities that are capable of keeping pace with the digital transformation, and to create training courses aimed at developing the competence of university leaders in business intelligence (Al-Ghamdi and Aqili, 2022). Alamr (2018) also indicated that the availability of a strong infrastructure, holding training courses that address employees' weaknesses when dealing with business intelligence applications, and allocating sufficient budgets to facilitate the implementation of business

intelligence systems are important and essential factors for the success of business intelligence implementation in universities

RESEARCH METHODOLOGY

To achieve the study's objectives, quantitative approach has been adopted. This approach is considered the most appropriate for the topic and objectives of the research, as well as for collecting and analyzing data quantitatively.

2.1 Research tool

For data collection purposes, a questionnaire was designed consisting of four main sections. The first axis included demographic variables related to the study sample. The second axis included statements indicating the level of business intelligence implementation at Al-Balqa' Applied University. The third axis included statements indicating the challenges facing business intelligence implementation, while the fourth axis included a set of proposal solutions to overcome these challenges and enhance the level of business intelligence implementation at Al-Balqa' Applied University.

2.2 Research sample

The questionnaire was distributed electronically to a sample of 90 administrative leaders working at Al-Balqa' Applied University. The number of valid questionnaires for analysis was 75.

RESEARCH ANALYSIS

The data was analyzed by using the Statistical Package for Social Sciences (SPSS) version 26, The results were presented in the frequency and descriptive tables, Cronbach's Alpha was performed to compute the internal consistency and Pearson's correlation coefficients to test the validity of tool, Counts and percentages of the personal information, Mean and Standard deviation of the Likert scale items were calculated to answer the research questions and t-test and ANOVA test analysis was conducted in order to test the hypotheses.

Validity of the questionnaire

To determine the validity of the tool's content, it was verified by (10) highly qualified and experienced consultants and leaders, who are specialized in applying business intelligence, to ensure the validity of the content and correct the wording of the tool's paragraphs when needed. The expert groups provided valuable comments and suggestions while adapting the scope of

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES :
CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT
AL-BALQA' APPLIED UNIVERSITY

the relevant process. Based on the valuable comments and suggestions of the group, some modifications were made and some phrases were rephrased. The validity of the questionnaire was also determined using SPSS, by calculating the internal consistency and Pearson's correlation coefficient between each paragraph and the questionnaire domain to which it belongs. Table (1) shows the correlation coefficients between the study variables and the tool as a whole.

Table1. Pearson's correlation coefficients between the study variables and the tool as a whole

Variables	The level of business intelligence implementation	The challenges facing the implementation of business intelligence	Solutions to enhance the level of business intelligence implementation and overcome the challenges	Overall instrument
the level of business intelligence implementation	1	.870**	.942**	.978**
The challenges facing the implementation of business intelligence		1	.954**	.947**
solutions to enhance the level of business intelligence implementation and overcome the challenges			1	.989**
Overall instrument				1

The results in table (1) showed that all correlation coefficients were statistically significant at the significance level (0.01), which indicates internal consistency between all questionnaire statements.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

Reliability of the questionnaire

The study examined the variables' reliability which is important and widely used in the social studies. The main aim of this test is to check the extent of the measuring items of the variables are reliable to measure the target factors, Cronbach Alpha is the most common measure used to conduct reliability analysis for the measuring items validity. In general, the reliability coefficient is ranked between 0 to 1, although the different assumptions discussed this issue and suggest different cuts-off acceptable values, but the most of statisticians agree to accept at least 0.6 value to consider a reliable measure as stated by Sekaran and Bougie (2019). The higher of coefficient value the higher degree of measurements reliability. Table (2) shows the result.

4. Table 2. Reliability Results

Variables name	Items numbers	Reliability	Status
the level of business intelligence implementation at Al-Balqa' Applied University	11	.983	Reliable
The challenges facing the implementation of business intelligence	5	0.990	Reliable
solutions to enhance the level of business intelligence implementation and overcome the challenges	9	.988	Reliable
Overall instrument	25	.992	Reliable

Table (2) showed the study reliability values (all above 0.98) show exceptional internal consistency. It means the items within each variable are measuring their respective concepts very consistently.

Research findings

The demographics of the sample are given in Table (3) which presented their demographics characteristics

Table 3. Summaries the demographic characteristics of the participants.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES :
CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT
AL-BALQA' APPLIED UNIVERSITY

Demographic	Frequency	Percent
Gender		
Male	49	65.3
Female	26	34.7
educational level		
Diploma	9	12
Bachelor degree	39	52
Postgraduate	27	36
Years of experience		
less than 5 years	17	22.7
5 – 15 years	29	38.7
over 15 years	29	38.7
position		
Department head	14	18.7
Deputy head	28	37.3
Dean	20	26.7
Supervisor	13	17.3

The study includes 75 administrative leaders at Al-Balqa' Applied University, for gender distribution, the percentage of males 49 (65.3%) was higher than the percentage of females 26 (34.7%), and most of them have bachelor degree 39(52%) while 27(36 %) of them Postgraduate and 9(12%) of them diploma , regard to years of experience, the experience of the majority of the sample ranged from (5-15) years 29(38.7%) , over 15 years 29 (38.7)% and 17(22.7) less than 5 years , regarding the position, the majority of the sample was (37.3%) deputy head, (26.7%) dean, (18.7%) department head and (17.3%) were supervisors.

Recommendations related to the first question of the study, which states" What is the level of business intelligence implementation at Al-Balqa' Applied University from the perspective of administrative leaders?"

To answer this question, the arithmetic means and standard deviations and frequencies percentages of the study sample members' will estimate the level of implementation of business intelligence at Al-Balqa Applied University from the point of view of administrative leaders, and Table (4), Table (5) shows the results.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

Table 4. Arithmetic means and standard deviations of the study sample regarding the level of business intelligence implementation

No.	Statement	Mean	SD
1	Developing strategies capable of predicting future conditions	3.63	1.024
2	Solving administrative problems	3.76	.898
3	Facilitating the transfer of information across various units and departments	3.67	.949
4	Identifying university needs in accordance with university objectives	3.65	.966
5	Monitoring and tracking performance	3.68	.961
6	Making information readily available	3.77	.909
7	Developing administrative processes	3.76	.867
8	Developing financial processes	3.77	.879
9	Searching for new knowledge	3.47	1.189
10	Training employees and enhancing their knowledge related to business intelligence	3.47	1.189
11	Making sound decisions	3.63	1.100
	the level of business intelligence implementation Average	3.65	.889

Table 5. Participants perceived regarding the level of business intelligence implementation

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Developing strategies capable of predicting future conditions	13.3	56	6.7	6.7	6.7
Solving administrative problems	13.3	62.7	14.7	5.3	4
Facilitating the transfer of information across various units and departments	13.3	57.3	14.7	12	2.7
Identifying university needs in accordance with university objectives	13.3	56	17.3	9.3	4
Monitoring and tracking performance	14.7	56	14.7	12	2.7

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

Making information readily available	14.7	61.3	14.7	5.3	4
Developing administrative processes	14.7	56	24	1.3	4
Developing financial processes	13.3	62.7	16	4	4
Searching for new knowledge	16	45.3	18.7	9.3	10.7
Training employees and enhancing their knowledge related to business intelligence	13.3	49.3	22.7	0	14.7
Making sound decisions	16	52	21.3	0	10.7

The result in table (4) shows that the level of business intelligence implementation at Al-Balqa Applied University from the point of view of administrative leaders was high with mean (3.65) and standard deviation (.889). (69.3%) of the sample agree that the university developing strategies capable of predicting future conditions with mean (3.63) and standard deviation (1.024), and (76%) of them found the university solving administrative problems with mean (3.76) and standard deviation (.898), also (70.6%) of them agree there is facilitating in the transfer of information across various units and departments with mean (3.67) and standard deviation (.949).

The findings revealed a high agreement with (70.7%) sample and with a mean of (3.68), (3.76) and standard deviation (.961). Accordingly, (62.8%) ensure that the university provides employees with training and enhancing their knowledge related to business intelligence with mean (3.47) and standard deviation (1.189). Moreover, (76%) of the sample confirmed that information readily available with mean (3.77) and standard deviation (.909), and (61.3%) confirmed that they are able to search for new knowledge with mean (3.47) and standard deviation (1.189).

This result differs from what was found by the study of Al-Hajreh (2018) and Al-Omari and Aqili (2020). Al-Hajreh (2018) indicated that the application of business intelligence dimensions was moderate in Jordanian public universities, while Al-Omari and Aqili (2020) found an average level of business intelligence implementation from the perspective of administrative leaders at King Abdulaziz University. In contrast, this result is consistent with the study of Al-Harthi and Al-Khathlan (2022) which found a high level of business intelligence implementation at Prince Sattam bin Abdulaziz University, and with Awamleh's study (2022) which indicated a high level of business intelligence in Jordanian telecommunications companies across all dimensions.

Recommendations related to the second question of the study, which states" What are the challenges facing the implementation of business intelligence at Al-Balqa' Applied University from the perspective of administrative leaders ?"

To answer this question, the arithmetic means and standard deviations and frequencies percentages of the study sample members' will estimate the challenges facing the implementation of business intelligence at Al-Balqa' Applied University from the perspective of administrative leaders, table (6) shows the result.

Table 6. Number (percent) and Mean (standard deviation) for challenges facing the implementation of business intelligence

item	No. of respondents (%) (n=75)					Mean (SD)
	Strongly Agree Disagree	Agree	Neutral	Disagree	Strongly Disagree	
Financial challenges	16(16)	37(49.3)	22(29.3)	0	4(5.3)	3.71(.927)
Lack of experience among staff working with business intelligence systems	12(16)	42(56)	17(22.7)	0	4(5.3)	3.77(.909)
Lack of training courses aimed to enhance employees' capabilities related to business intelligence	17(22.7)	37(49.3)	17(22.7)	0	4(5.3)	3.84(.959)
Lack of infrastructure readiness	12(16)	42(56)	17(22.7)	4(5.3)	0	3.77(.909)
The university's failure to adopt business intelligence practices in all activities and operations	13(17.3)	37(49.3)	17(22.7)	4(5.3)	4(5.3)	3.68(1.002)
The challenges facing the implementation of business intelligence Average						**3.75(.909)**

The results about the challenges facing the implementation of business intelligence at Al-Balqa' Applied University as showed in table (6) found that (72%) of the sample confirmed that lack of training courses aimed to enhance employees' capabilities related to business intelligence , lack of experience among staff working with business intelligence systems challenges facing the implementation of business intelligence, and lack of infrastructure readiness with mean (3.84), (3.77) and standard deviation (.959), (.909) accordingly. (65.3%) agreed there is financial challenges with mean (3.71) and standard deviation (.927). Moreover, around (66.6%) of the sample confirmed the university's failure to adopt business intelligence practices in all activities and operations with mean (3.68) and standard deviation (1.002). This result is

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

supported by the study of Rahman et al. (2016) and Al-Ghamdi and Aqili (2022) which confirmed the existence of challenges related to the material costs and training aspects, as the lack of training directly affects the experience of workers. It is also supported by Tripathi et al. (2024) which emphasized on the lack of a qualified workforce.

Recommendations related to the third question of the study, which states" What are the proposed solutions to enhance the level of business intelligence implementation and overcome the challenges facing its implementation at Al-Balqa' Applied University from the perspective of administrative leaders?"

To answer this question, the arithmetic means and standard deviations and frequencies percentages of the study sample members' will estimate the proposed solutions to enhance the level of business intelligence implementation and overcome the challenges facing its implementation at Al-Balqa' Applied University from the perspective of administrative leaders, where table (7) shows the results.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

Table 7. Number (percent) and Mean (standard deviation) for the proposed solutions to enhance the level of business intelligence implementation

item	No. of respondents (%) (n=75)					Mean (SD)
	Strongly Disagree	Agree	Neutral	Disagree	Strongly Agree	
Providing specialized technical personnel to manage and implement business intelligence	12(16)	38(50.7)	17(22.7)	4(5.3)	4(5.3)	3.67(.991)
Identifying the financial resources needed to implement business intelligence	12(16)	41(54.7)	18(24)	0	4(5.3)	3.76(.913)
Identifying the objectives required to be achieved from implementing business intelligence (a clear vision)	12(16)	38(50.7)	21(28)	1(1.3)	3(4)	3.73(.890)
Establishing specialized centers for business intelligence management	12(6)	48(64)	12(16)	0	3(4)	3.88(.821)
Designing training courses aimed to enhance the expertise and knowledge of employees and departments in business intelligence techniques	13(17.3)	44(58.7)	14(18.7)	1(1.3)	3(4)	3.84(.871)
Administrative orientation towards implementing Business intelligence in various university administrative activities and operations	13(17.3)	40(53.3)	18(24)	1(1.3)	3(4)	3.79(.890)
Benefiting from the experiences of advanced countries in implementing business intelligence	16(21.3)	41(54.7)	15(20)	0	3(4)	3.89(.879)
Allocating sufficient financial resources for business intelligence management	12(16)	45(60)	12(16)	3(4)	3(4)	3.80(.900)
Enhancing the level of infrastructure readiness	12(16)	46(61.3)	11(14.7)	3(4)	3(4)	3.81(.896)
The proposed solutions to enhance the level of business intelligence implementation Average						**3.79(.835)**

The result regarding the proposed solutions to enhance the level of business intelligence implementation and overcome the challenges facing its implementation at Al-Balqa' Applied University from the perspective of administrative leaders as showed in table (7) found that (76%) of the sample agreed with benefiting from the experiences of advanced countries in implementing business intelligence with mean (3.89) and standard deviation (.879). (77%) confirmed that enhancing the level of infrastructure readiness will enhance the level of business intelligence implementation with mean (3.81) and standard deviation (.896), (76 %) confirmed allocating sufficient financial resources for business intelligence management with mean (3.80) and standard deviation (.900). Moreover, (70.6%) of the respondents ensured that

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES :
CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT
AL-BALQA' APPLIED UNIVERSITY

administrative orientation towards implementing Business intelligence in various university administrative activities and operations will enhance the level of business intelligence implementation with mean (3.79) and standard deviation (.890). This result s supported with the study of Alamr (2018) which emphasized the need to strengthen infrastructure and allocate the necessary financial resources to implement business intelligence in the work environment. The result also aligned with the study of Al-Ghamdi and Aqili (2022) which stressed the important of benefit from the experiences of countries and organizations in implementing business intelligence.

(76%) of the sample confirmed that need to design training courses to enhance the expertise and knowledge of employees and departments in business intelligence techniques with mean (3.84) and standard deviation (.871). Furthermore, (66.7%) agreed with providing specialized technical personnel to manage and implement business intelligence and identifying the objectives required to be achieved from implementing business intelligence (a clear vision) with mean (3.67), (3.73) and standard deviation (.991), (.890) accordingly. This finding agreed with Alamr (2018) which indicated to the necessary to hold training courses that address employees' weaknesses when dealing with business intelligence applications

Hypotheses test

H1: Is there any Are there any statistically significant differences among the study sample's answers regarding the level of business intelligence implementation at Al-Balqa' Applied University attributed to gender, educational level, years' experience and position?
To verify and answer the first hypothesis there any statistically significant differences among the study sample's answers regarding the level of business intelligence implementation at Al-Balqa' Applied University attributed to gender, educational level, years' experience and position, a T-test was conducted for the gender variable and a one-way ANOVA test was conducted for the variables of educational level, years' experience and position. table (8), table (9) shows the results.

Table 8.T-test for gender variable to detect significant differences in the level of business intelligence implementation

Variable	Males (n=49)	Females (n=26)	t-value	df	Sig.(p value)	Conclusion
The level of business intelligence implementation at Al-Balqa' Applied University	3.87 (.098)	3.26 (1.090)	2.959	1	0.004	Statistically significant, favors males

It is shown from the results of table (8) that the arithmetic mean for males is higher than the arithmetic means for females, and the level of statistical significance reached (0.004) less

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES :
CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT
AL-BALQA' APPLIED UNIVERSITY

than (0.05). So, there are statistically significant differences in the level of application of business intelligence according to the gender variable, in favor of males.

Table 9. Multiple variance analysis of the arithmetic means of the study sample's estimates according to (educational level, years' experience and position)

Source	variable	sum of squares	df	Mean squares	f	Sig	Conclusion
Educational level	The level of business intelligence implementation at Al-Balqa' Applied University	6.843	2	3.422	4.760	0.011	Statistically significant difference
Year of Experience		5.909	2	2.955	4.038	0.022	Statistically significant difference
Position		.357	3	.119	0.145	0.933	No Statistically significant difference

It is noted from Table (9) that there are statistically significant differences at the level of statistical significance ($\alpha = 0.05$) for the estimates of the study sample on the responses of the study sample according to the variable of educational level and years of experience in the level of business intelligence implementation at Al-Balqa' Applied University, and there are no statistically significant differences at the level of statistical significance ($\alpha = 0.05$) for the estimates of the study sample on the responses of the study sample according to position.

H2: Is there any Are there any statistically significant differences among the study sample's answers regarding the challenges facing the implementation of business intelligence at Al-Balqa' Applied University attributed to gender, educational level, years' experience and position ?

To verify and answer the second hypothesis there any statistically significant differences among the study sample's answers regarding the challenges facing the implementation of business intelligence at Al-Balqa' Applied University attributed to gender, educational level, years' experience and position, a T-test was conducted for the gender variable and a one-way ANOVA test was conducted for the variables of educational level, years' experience and position. Table (10), table (11) shows the results.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES :
CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT
AL-BALQA' APPLIED UNIVERSITY

Table 10.T-test for gender variable to detect significant differences in the challenges facing the implementation of business intelligence

Variable	**Males (n=49)**	**Females (n=26)**	t-value	**df**	**Sig. (p value)**	**Conclusion**
The level of business intelligence implementation at Al-Balqa' Applied University	3.83(.717)	3.60(1.191)	1.047	73	0.286	No Statistically significant difference

Table 11. Multiple variance analysis of the arithmetic means of the study sample's estimates according to (educational level, years' experience and position)

Source	Variable	sum of squares	df	Mean squares	f	Sig	Conclusion
Educational level	The challenges facing the implementation of business intelligence at Al-Balqa' Applied University	7.828	2	3.914	5.284	.007	Statistically significant difference
Year of Experience		4.486	2	2.243	2.849	.064	No Statistically significant difference
Position		3.185	3	1.062	1.300	.281	No Statistically significant difference

It is noted from Table (10) , Table (11) that there are statistically significant differences at the level of statistical significance ($\alpha = 0.05$) for the estimates of the study sample on the responses of the study sample according to the variable of educational level in the challenges facing the implementation of business intelligence at Al-Balqa' Applied University, and there are no statistically significant differences at the level of statistical significance ($\alpha = 0.05$) for the estimates of the study sample on the responses of the study sample according to gender , year of experience and position.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES :
CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT
AL-BALQA' APPLIED UNIVERSITY

Conclusion

The research aimed to find the level of business intelligence implementation at Al-Balqa' Applied University from the perspective of administrative leaders, detect the challenges facing its implementation and propose solutions to enhance the level of business intelligence implementation and overcome those challenges. The results revealed that the level of business intelligence implementation at Al-Balqa Applied University from the point of view of administrative leaders was high. The result indicated that there are many challenges facing the implementation of business intelligence at Al-Balqa' Applied University, including the lack of training courses aimed to enhance employees' capabilities related to business intelligence, lack of experience among staff working with business intelligence systems challenges facing the implementation of business intelligence, lack of infrastructure readiness and lack of the material costs.

The research recommends in benefiting from the experiences of advanced countries in implementing business intelligence, allocating sufficient financial resources for business intelligence management and implementing business intelligence in various university administrative activities and operations. These practices will contribute to enhancing the level of business intelligence implementation and overcome the challenges facing its implementation at Al-Balqa' Applied University from the perspective of administrative leaders.

THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES : CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT AL-BALQA' APPLIED UNIVERSITY

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THE IMPLEMENTATION OF BUSINESS INTELLIGENCE IN JORDANIAN UNIVERSITIES :
CHALLENGES AND SOLUTIONS FROM THE PERSPECTIVE OF ADMINISTRATIVE LEADERS AT
AL-BALQA' APPLIED UNIVERSITY

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