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Research Article

The Impact of Integrating Artificial Intelligence and Business Intelligence on Developing Talent Management Strategies

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Abstract

This study aimed to examine the impact of integrating artificial intelligence and business intelligence on developing talent management strategies in Jordanian organizations, in light of rapid digital transformation and the increasing reliance on data to support decision-making. The study adopted the mixed-methods approach through a sequential explanatory design, where quantitative data were collected using a questionnaire distributed to a sample of (379) individuals working in the Jordanian banking sector and the companies Orange Jordan and Zain Jordan, while qualitative data were collected through semi-structured interviews with a group of specialists. The results showed a positive and significant impact of both artificial intelligence and business intelligence on the dimensions of talent management, represented by talent attraction, talent development, and talent retention. The results also showed that the impact of this integration was highest in the talent development dimension, followed by talent attraction, while its impact was relatively lower in talent retention. The interview results confirmed that smart technologies contribute to improving decision accuracy, accelerating processes, and enhancing the efficiency of human resource management, while pointing to the importance of integration between smart analytics and the human element. The study concludes that the true value of artificial intelligence and business intelligence lies in their integration within a unified analytical framework that supports strategic decision-making related to talent. The study also provides a theoretical contribution by linking these variables in a single model, and a practical contribution represented by providing recommendations that help Jordanian organizations employ smart technologies to improve talent management and enhance their competitiveness.

Keywords: Artificial intelligence, Business intelligence, Talent management, Talent attraction, Talent development, Talent retention.

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Introduction

Digital transformation has become a strategic transformation that is reshaping operations, decision-making, and human resource management, enhancing flexibility, performance, and competitiveness, and making technology part of the organizational infrastructure [1-3]. In this context, artificial intelligence and business intelligence have emerged as key tools: the former provides predictive capabilities and smart automation, while the latter supports data analysis and decision-making, with a clear impact on developing human resource practices [4-8]. In turn, talent management has become a strategic approach focused on attracting, developing, and retaining competencies to enhance performance and innovation, especially in digital environments [9-11]. Nevertheless, studies addressing the integration between artificial intelligence and business intelligence in talent management remain limited, especially in the Arab context, despite recent literature emphasizing the importance of this integration [7,8,12,13]. Accordingly, this study comes to provide an integrative framework that links these variables in a way that supports decision quality, the efficiency of human resource management, and organizational competitiveness [5,6,11].

Artificial Intelligence in Human Resources: Concept, Evolution, and Applications

Artificial intelligence in human resources has come to be used as an employment of algorithms and machine learning to improve human resource functions, including recruitment, training, performance evaluation, and forecasting future needs. This field has moved from a procedural role to a strategic role that supports decision-making, raising the efficiency and accuracy of human resource practices [14]. Its most mature applications are concentrated in recruitment, performance analysis, and forecasting skill needs and employee turnover, with the continuing challenges of fairness and algorithmic bias [15,16].

Studies also confirm that integrating artificial intelligence achieves operational gains such as improving accuracy, reducing time and cost, and enhancing real-time analysis, which makes it a pivotal tool in talent management [17]. This is consistent with the Arab literature that points to the importance of employing it in recruitment and human resource management, provided that data, competencies, and organizational adaptation are available, and without settling for a superficial application of the technology [18,19].

Business Intelligence: Definition, Tools, and Its Role in Supporting Decision-Making

Business intelligence is defined as a system of tools and processes that transform data into information and analytics that support decision-making through reports, dashboards, and predictive analytics. The literature confirms that its core value lies in improving decision quality by raising the accuracy and interpretability of information, which reflects positively on organizational performance, especially when organizational support and a data-driven culture are present

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[20,21]. Studies have also shown, especially in the Jordanian context, that adopting business intelligence clearly contributes to improving the effectiveness of decision-making [21].

Business intelligence likewise contributes to enhancing operational efficiency and competitiveness through data analysis and the discovery of opportunities, and its effectiveness increases when its outputs are actually used in decision-making, not merely as reporting systems [20]. At the Arab level, its impact is linked to the extent of development of the information infrastructure and analytical skills within organizations [22].

Talent Management: Concept and Dimensions

Talent management is defined as a strategic approach that focuses on attracting, developing, and retaining competencies in a way that meets the organization's current and future needs. Recent literature points to the evolution of this concept from a focus on elites to a broader perspective linked to building capabilities, organizational flexibility, and skills management, with the three core dimensions (attraction, development, retention) adopted as a main framework for application [23-25]. In the Arab context, studies agree with this approach and confirm the link between talent management and performance and competitive advantage, with the necessity of adopting an integrated strategic perspective [26,27].

Integration between Artificial Intelligence and Business Intelligence

The literature confirms that the highest value is achieved from the integration of artificial intelligence and business intelligence, where the former provides predictive and analytical capabilities, while the latter provides the infrastructure necessary to transform them into practical decisions, in what is known as augmented analytics [28]. Studies have shown that this integration enhances performance, efficiency, and decision accuracy, especially when it is embedded in core operations [29]. It is also beneficial in talent management by supporting recruitment and development decisions and risk forecasting, with a proven role of business intelligence in improving performance and evaluation [28-30].

Study Problem

In light of rapid digital transformation, talent management has come to rely increasingly on the use of digital and analytical tools, foremost among them artificial intelligence and business intelligence, to support making more accurate and effective decisions. However, the use of these two fields in many organizations still takes place separately, without leveraging the strategic value resulting from their integration, especially in the field of talent management [31].

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Despite the growing number of studies on each of artificial intelligence and business intelligence individually, there is a clear shortcoming in the studies that have addressed the impact of their integration on developing talent management strategies, particularly in the Arab and Jordanian context. Accordingly, the study problem is represented by the lack of clarity of the role of this integration in improving the attraction, development, and retention of talent, which calls for examining this relationship scientifically to bridge the knowledge gap and provide practical implications for organizations [32].

Study Questions

In light of the study problem, the current study seeks to answer the following main question: What is the impact of integrating artificial intelligence and business intelligence on developing talent management strategies in Jordanian organizations?

The following sub-questions branch out from this main question:

1. What is the impact of artificial intelligence on talent attraction in Jordanian organizations?
2. What is the impact of artificial intelligence on talent development in Jordanian organizations?
3. What is the impact of artificial intelligence on talent retention in Jordanian organizations?
4. What is the impact of business intelligence on talent attraction in Jordanian organizations?
5. What is the impact of business intelligence on talent development in Jordanian organizations?
6. What is the impact of business intelligence on talent retention in Jordanian organizations?

Study Hypotheses

Based on the study problem and its objectives, and relying on the independent variable represented by the integration of artificial intelligence and business intelligence, and the dependent variable represented by talent management strategies, the study hypotheses were formulated as follows:

Main hypothesis: There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of the integration of artificial intelligence and business intelligence on developing talent management strategies in Jordanian organizations.

Sub-hypotheses:

1. There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of artificial intelligence on talent attraction in Jordanian organizations.
2. There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of artificial intelligence on talent development in Jordanian organizations.

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3. There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of artificial intelligence on talent retention in Jordanian organizations.
4. There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of business intelligence on talent attraction in Jordanian organizations.
5. There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of business intelligence on talent development in Jordanian organizations.
6. There is no statistically significant impact at the significance level ($\alpha \leq 0.05$) of business intelligence on talent retention in Jordanian organizations.

Significance of the Study

The significance of the study is represented by the following:

First: Theoretical significance

It is represented by its addressing of a recent topic that brings together artificial intelligence, business intelligence, and talent management, with a focus on the integrative impact among them, which is a field that is still limited, especially in the Arab context. It also contributes to enriching the literature by providing a theoretical framework that explains the relationship between smart analytics and strategic talent decisions, while adopting a comprehensive perspective that includes attraction, development, and retention.

Second: Practical significance

It is represented by helping Jordanian organizations understand the role of integrating artificial intelligence and business intelligence in improving talent management decisions, and supporting the various departments in developing more effective, data-driven policies, in a way that enhances organizational efficiency and competitiveness in a fast-paced digital environment.

Previous Studies

First: Arab studies

Recent Arab studies point to the employment of artificial intelligence in human resource management from an applied perspective. The results of Al-Qahtani's study (2022) showed that the level of use is still moderate, with the presence of high obstacles, which reflects the need for greater organizational and technical readiness. Ibrahim's study [33] also confirmed the possibility of artificial intelligence contributing to the development of practices, while its impact remains contingent on the availability of infrastructure, skills, and data, whereas Al-Tabbal's study [34] presented an

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applied framework that highlights its role in human resource planning and recruitment, with a greater focus on the operational aspect compared to the strategic one.

Regarding business intelligence, Jawa's study [35] showed a positive impact of it on improving the effectiveness of decision-making, despite the presence of applied challenges. Arab studies also tend to address it in its relationship with performance and entrepreneurship more than its direct link with talent management.

As for talent management, the study by Al-Kayed and Al-Balloush [36] showed its impact on employee retention, with a mediating role for organizational justice, while Al-Asbahi's study [37] confirmed the expansion of its concept to include capability development. Nevertheless, these studies often addressed talent management in a traditional or independent manner, without linking it to the integration of artificial intelligence and business intelligence.

Second: Foreign studies

At the foreign level, recent studies have focused on the role of artificial intelligence in human resources and talent management. The model of Rožman et al. [38] showed that integrating it into attraction, development, and retention is positively associated with performance and employee engagement, while the review by Dima et al. [39] showed that its impact extends to automation, improving the use of data, enhancing human capabilities, and reshaping the work environment, which reflects its transformation into a strategic factor.

In the field of business intelligence, the study by Mekimah et al. [40] clarified the weakness of its integration with human resources and the need for integrative research. The review by Al-Daraba et al. [41] also confirmed that its adoption is affected by technical, organizational, and individual factors, which is consistent with the results of Hülter et al. [42], which highlighted the role of users' perception in adopting human resource analytics.

As for talent management, the study by Supi et al. [43] showed that its impact on reducing turnover intention is indirect, while Sugiono et al. [44] confirmed its association with job thriving and voice behavior, whereas Razali et al. [45] pointed to the expansion of the field with continued fragmentation and the need to link it with digital transformation.

Based on that, the literature reveals the absence of integration between artificial intelligence, business intelligence, and talent management, as these variables are often studied separately, especially in the Arab context. Hence, the research gap is represented by the limited number of studies that have addressed the impact of this integration on talent management, which justifies studying its role in the attraction, development, and retention of talent in Jordanian organizations.

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Methodology

Approach followed: The study population consists of employees in the Jordanian organizations most connected to the study topic, and more specifically employees in **the banks operating in Jordan**, in addition to employees in the companies **Orange Jordan** and **Zain Jordan**, given that these organizations are among the entities most reliant on digital transformation, data, and smart technologies, and they also represent a suitable environment for studying the employment of artificial intelligence and business intelligence in talent management.

Data from the **Association of Banks in Jordan** indicate that the number of employees in the Jordanian banking sector reached **22,996 employees** at the end of 2024 [46]. The **2024 Annual Report of Orange Jordan** also shows that the number of its employees reached **1,246 employees**. Likewise, the **2024 Sustainability Report of Zain** shows that the number of full-time employees at Zain Jordan reached **1,329 employees**. Accordingly, the **total study population** amounts to:

22,996 + 1,246 + 1,329=25,571 individuals [46].

Study Sample

In the quantitative part, the study relied on a sample of employees in the organizations under study, and its size was determined based on the Krejcie and Morgan [47] table, which is considered one of the tables most widely used in survey studies to determine the appropriate sample size in light of the size of the original population. Since the study population amounts to 25,571 individuals, the appropriate sample size at a 95% confidence level and a 5% margin of error equals 379 individuals [47].

To reduce the effect of non-returned questionnaires or those invalid for analysis, a larger number of questionnaires ranging between 400 and 420 questionnaires may be distributed, provided that the minimum adopted for statistical analysis is 379 valid questionnaires.

As for the qualitative part, a purposive sample of managers and specialists in the departments of human resources, information technology, business intelligence, and planning or institutional development will be used, with the number of interview participants ranging between 10 and 15 participants, which is a suitable number in mixed studies that use interviews for the purposes of interpretation and qualitative depth [48,49].

Data Collection Tools

The study relied on two main tools for data collection. The first tool was the questionnaire as the main tool in the quantitative phase, and it was designed based on the study variables and their dimensions, such that it included items measuring the two dimensions of artificial intelligence and business intelligence, and items measuring the dimensions

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of talent management strategies represented by talent attraction, development, and retention, using a five-point Likert scale.

The second tool was the semi-structured interviews, which will be used after analyzing the questionnaire data with a number of managers or specialists, with the aim of interpreting the quantitative results and uncovering the way in which the applications of artificial intelligence and business intelligence are embodied in the actual practices of talent management within organizations.

Validity and Reliability of the Instrument

To ensure the validity of the study tools, the questionnaire and the interview guide will be presented to a number of referees with expertise in management, human resources, and scientific research, in order to verify face validity and content validity. The reliability of the questionnaire will also be tested using the Cronbach's alpha coefficient to measure the internal consistency among the items, with a statistically acceptable reliability coefficient considered an indicator of the instrument's suitability for application and analysis.

Data Analysis Methods

In the quantitative phase, the questionnaire data will be analyzed using the SPSS statistical software, through applying descriptive statistics such as means and standard deviations to describe the responses of the sample members, then using correlation coefficients and regression analysis to test the impact of artificial intelligence and business intelligence on the dimensions of talent management strategies, in a manner consistent with the study hypotheses.

As for the qualitative phase, the interview data will be analyzed using thematic analysis, through coding the responses and extracting the main themes that help interpret the quantitative results and link them to the actual institutional context. This combination of quantitative and qualitative analyses allows for providing a deeper interpretation of the relationships revealed by the statistical results [48,49].

Study Limitations

The study is defined by a number of limits. In terms of subject limits, it is restricted to examining the impact of integrating artificial intelligence and business intelligence on talent management strategies with their three dimensions: attraction, development, and retention. In terms of human limits, it is restricted to employees in the banks operating in Jordan and the companies Orange Jordan and Zain Jordan. In terms of spatial limits, the study is conducted in the Hashemite Kingdom of Jordan. As for temporal limits, it is restricted to the period during which the field data are collected and analyzed. Among the limitations of the study is also its methodological reliance on the questionnaire

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and interviews, which may make the results affected by the participants' degree of response and their subjective perception of the nature of the practices within their organizations.

Study Results: Demographic Characteristics of the Study Sample

Variable	Category	Frequency	Percentage %
Gender	Male	199	52.5
	Female	180	47.5
Age	Less than 25 years	52	13.7
	25–35 years	172	45.4
	36–45 years	100	26.4
	More than 45 years	55	14.5
Academic qualification	Diploma	77	20.3
	Bachelor's	203	53.6
	Master's	84	22.2
	Doctorate	15	4.0
Years of experience	Less than 5 years	124	32.7
	5–10 years	143	37.7
	More than 10 years	112	29.6
Department	Human resources	104	27.4
	Information technology	98	25.9
	Planning and development	75	19.8
	Senior management	42	11.1
	Other	60	15.8
Total		379	100%

Table 1. Demographic characteristics of the study sample

It is clear from (**Table 1**) that the distribution of the study sample members in terms of gender was close, as the percentage of males reached (52.5%) compared to (47.5%) for females, which reflects an acceptable balance in the representation of both genders. In terms of age, the largest percentage was concentrated within the age group (25–35 years) at a rate of (45.4%), followed by the group (36–45 years) at a rate of (26.4%), which indicates that the majority of the sample is from professionally active age groups. Regarding academic qualification, the majority were holders of a bachelor's degree at a rate of (53.6%), followed by holders of a master's degree at a rate of (22.2%), which reflects a good educational level among the sample members. In terms of years of experience, the sample was distributed in a close manner, as the percentage of those with experience of (5–10 years) reached (37.7%), which is the highest percentage, indicating that the sample includes individuals with appropriate practical experience. As for the distribution of the sample by department, the highest percentage came in the human resources department (27.4%), followed by information technology (25.9%), then planning and development (19.8%), which reinforces the sample's suitability to the study topic related to talent management and modern technologies.

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Descriptive Statistics of the Study Variables

Variable	Number (N)	Minimum	Maximum	Mean	Standard Deviation
Artificial intelligence	379	1.40	5.00	3.7098	0.79421
Business intelligence	379	1.50	5.00	3.6517	0.78533
Talent attraction	379	1.25	5.00	3.6811	0.79702
Talent development	379	1.63	5.00	3.9050	0.74356
Talent retention	379	1.13	5.00	3.6616	0.79911

Table 2. Descriptive statistics of the study variables

It is clear from (**Table 2**) that the means for all the study variables came higher than the hypothetical mean (3), which indicates a relatively high level in the sample members' perception of the practices of artificial intelligence, business intelligence, and talent management strategies within the organizations. The talent development variable came in first place with a mean of (3.9050), followed by artificial intelligence with a mean of (3.7098), then talent attraction with a mean of (3.6811), while the talent retention variable came with a mean of (3.6616), and finally business intelligence with a mean of (3.6517).

Reliability Coefficient (Cronbach's Alpha) of the Study Instrument

Variable / Axis	Number of Items	Cronbach's Alpha Coefficient
Study instrument	5	0.844

Table 3. Reliability coefficient (Cronbach's Alpha) of the study instrument

It is clear from (**Table 3**) that the value of the Cronbach's alpha coefficient reached (0.844), which is a high value that exceeds the statistically acceptable minimum (0.70), which indicates that the study instrument enjoys a high degree of reliability and internal consistency among its items, and therefore its results can be relied upon in the statistical analysis and testing of the study hypotheses.

Correlation Coefficients between the Study Variables

Variable	Artificial intelligence	Talent attraction	Talent development	Talent retention
Artificial intelligence	1	0.611**	0.619**	0.485**
Talent attraction	0.611**	1	0.488**	0.401**
Talent development	0.619**	0.488**	1	0.398**
Talent retention	0.485**	0.401**	0.398**	1

Table 4. Correlation coefficients between the study variables

It is clear from (**Table 4**) that there are positive and statistically significant correlation relationships between all the study variables, as the value of the correlation coefficient between artificial intelligence and talent attraction reached (0.611), between artificial intelligence and talent development (0.619), and between artificial intelligence and talent retention (0.485), all of which are significant at the (0.01) level.

The results also showed the presence of positive correlation relationships between the dimensions of talent management themselves, as the correlation coefficient between talent attraction and talent development reached (0.488), between talent attraction and talent retention (0.401), and between talent development and talent retention

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(0.398), which indicates the presence of interconnection between these dimensions. In general, these results indicate that the relationship between the variables is a direct relationship, meaning that the more the use of artificial intelligence increases, the more talent management strategies improve, which supports the general direction of the study hypotheses.

Correlation Coefficients between Business Intelligence and the Dimensions of Talent Management

Variable	Talent attraction	Talent development	Talent retention	Business intelligence
Talent attraction	1	0.488**	0.401**	0.564**
Talent development	0.488**	1	0.398**	0.628**
Talent retention	0.401**	0.398**	1	0.509**
Business intelligence	0.564**	0.628**	0.509**	1

Table 5. Correlation coefficients between business intelligence and the dimensions of talent management

It is clear from (**Table 5**) that there are positive and statistically significant correlation relationships between business intelligence and the dimensions of talent management, as the value of the correlation coefficient between business intelligence and talent attraction reached (0.564), between business intelligence and talent development (0.628), and between business intelligence and talent retention (0.509), all of which are significant at the (0.01) level.

The results also showed the presence of positive correlation relationships between the dimensions of talent management themselves, as the correlation coefficient between talent attraction and talent development reached (0.488), between talent attraction and talent retention (0.401), and between talent development and talent retention (0.398), which indicates the presence of interconnection between these dimensions. In general, these results indicate that increasing the use of business intelligence tools is associated with the improvement of talent management strategies, which supports the hypotheses that assume a positive relationship between these variables.

Results of the Multiple Linear Regression Analysis for the Impact of Artificial Intelligence and Business Intelligence on the Dimensions of Talent Management

Dependent Variable	R	R^2	F	Sig	Independent Variable	Beta	t	Sig
Talent attraction	0.679	0.462	161.198	0.000	Artificial intelligence	0.438	10.004	0.000
					Business intelligence	0.344	7.863	0.000
Talent development	0.719	0.517	201.522	0.000	Artificial intelligence	0.407	9.811	0.000
					Business intelligence	0.423	10.211	0.000
Talent retention	0.574	0.329	92.182	0.000	Artificial intelligence	0.307	6.274	0.000
					Business intelligence	0.355	7.257	0.000

Table 6. Multiple linear regression for the impact of artificial intelligence and business intelligence on the dimensions of talent management

It is clear from (**Table 6**) that the multiple linear regression model was statistically significant for all the dimensions of talent management, as the value reached (Sig=0.000), which indicates the fit of the model and its ability to explain the relationship between the independent and dependent variables. The results showed a statistically significant

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positive impact of both artificial intelligence and business intelligence on talent attraction, as the Beta value reached (0.438) for artificial intelligence and (0.344) for business intelligence, and the value of the coefficient of determination reached (R^2=0.462), meaning that the model explains (46.2%) of the variation in talent attraction.

The results also showed a statistically significant positive impact of both artificial intelligence and business intelligence on talent development, as the Beta value reached (0.407) for artificial intelligence and (0.423) for business intelligence, and the value reached (R^2=0.517), which indicates that the model explains (51.7%) of the variation in talent development.

The results showed a statistically significant positive impact of both artificial intelligence and business intelligence on talent retention, as the Beta value reached (0.307) for artificial intelligence and (0.355) for business intelligence, and the value reached (R^2=0.329), meaning that the model explains (32.9%) of the variation in talent retention.

As a result, the results indicate that both artificial intelligence and business intelligence play an important role in enhancing talent management strategies, as their impact was positive and significant on all dimensions, with a relative superiority in their impact on talent development compared to the rest of the dimensions.

Interviews

The Role of Artificial Intelligence in Talent Management

The interview results showed that artificial intelligence and business intelligence contribute to improving the efficiency and accuracy of talent management decisions, through the transition from traditional decisions to data-driven decisions. Participants pointed to the role of artificial intelligence in automating processes and improving decision quality, for example: “We rely on smart systems that help us screen CVs faster and more accurately than the traditional method (M-Y-HR-01)”, and “Artificial intelligence gives us indicators that help us make decisions based on real data and not only on personal experience (F-M-EX-10)”, in addition to its role in continuous evaluation: “We have become better able to evaluate employee performance because smart systems give us accurate and continuous reports (M-M-IT-07)”, while emphasizing the continued role of the human element: “Despite the importance of artificial intelligence, we still need the human element in interpreting the results and making the final decision (F-S-MG-08)”.

The Role of Business Intelligence in Supporting Talent Management Decisions

The results also showed that business intelligence supports decision-making by transforming data into analytical information. Participants pointed to its importance in building a comprehensive view: “Business intelligence systems help us see the complete picture of employees through clear and continuously updated reports (M-M-HR-11)”, and enhancing evidence-based decision-making: “We no longer rely on intuition, but rather on analytical reports that give us accurate indicators before making any decision (F-Y-IT-02)”, in addition to its predictive role: “Through data, we

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can predict problems such as a decline in performance or the likelihood of an employee leaving work (M-S-EX-05)", with the presence of analytical challenges: "Sometimes the data is available, but the problem is in how to analyze it or use it correctly (F-M-HR-14)".

The Impact of Smart Technologies on Talent Attraction

Regarding talent attraction, the results showed that the integration between smart technologies enhances speed, accuracy, and competitiveness, as is clear in: "Using smart systems, we have become able to reach suitable candidates faster, and we no longer waste time in manual screening (F-Y-HR-06)", and "The data we obtain from the systems helps us choose the most suitable candidate based on accurate criteria (M-M-MG-03)", and "Modern technologies give us a competitive advantage because we attract talent before competitors (M-Y-IT-15)", with the presence of system integration challenges: "Despite the availability of the tools, sometimes the challenge is in integrating them with current work systems (F-M-HR-04)".

The Impact of Smart Technologies on Talent Development

As for talent development, the interviews confirmed the role of smart analytics in customizing training and improving performance, as appears in: "Our training programs have become based on analyzing performance data, and not randomly as was the case previously (M-M-HR-11)", and "Smart systems help us determine the needs of each employee accurately, and therefore provide suitable training for them (F-Y-IT-12)", and "Through reports and analytics, we can follow the employee's development continuously and evaluate the impact of training on them (M-S-MG-13)", with challenges related to individuals' readiness: "The challenge is not in the availability of the systems, but in the extent of employees' readiness to deal with them and benefit from them (F-M-EX-10)".

The Impact of Smart Technologies on Talent Retention

In talent retention, the results pointed to the role of technologies in predicting employee behavior and improving the work environment, as in: "Through analytics, we can know the employees who may be thinking of leaving work before it actually happens (M-M-IT-07)", and "Data helps us understand employees' needs, and this helps us improve the work environment and increase their satisfaction (F-M-HR-14)", and "Management has come to rely on clear reports to identify the reasons for employee resignations and try to address them (M-Y-MG-09)", while pointing to the limitedness of their impact compared to other factors: "Technologies help us, but employee retention also depends on other factors such as salaries and the organizational environment (F-S-MG-08)".

The results of the study, in both its quantitative and qualitative parts, indicate a clear consistency between the quantitative and qualitative results, as the qualitative interviews supported what was reached through the statistical analysis. The regression results showed a positive and significant impact of both artificial intelligence and business intelligence on the dimensions of talent management, which was also confirmed by the answers of the interview

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participants, who pointed to the role of these technologies in improving the accuracy of decisions, accelerating processes, and enhancing the efficiency of human resource management.

For example, the quantitative results showed that the impact of artificial intelligence and business intelligence was highest on talent development, which was reflected in the qualitative results through the participants' emphasis on the role of smart analytics in identifying training needs and designing customized development programs. The results also showed a strong impact on talent attraction, which was supported by the interviews that highlighted the role of smart systems in improving the quality of selection and accelerating recruitment processes.

In contrast, the quantitative results showed that the impact of the independent variables on talent retention was relatively the lowest, which agrees with the qualitative results that indicated that talent retention does not depend only on smart technologies, but is also affected by other organizational and human factors such as the work environment and incentives.

Accordingly, the integration of the quantitative and qualitative results enhances the credibility of the study and the strength of its interpretation, as the quantitative data provide statistical evidence of the existence of the relationships, while the qualitative data provide a deeper understanding of how these relationships occur in practical reality, which supports the results of the study and confirms the validity of its hypotheses.

Discussion

The results of the study indicate that the integration of artificial intelligence and business intelligence contributes significantly to developing talent management strategies in Jordanian organizations, which reflects the shift toward data-driven decisions. A clear impact appeared in talent attraction through improving the speed and accuracy of recruitment, which is consistent with previous studies [15,17,20].

The greatest impact was also on talent development, as a result of the role of smart analytics in identifying training needs and improving performance, which is supported by recent literature [32,38,39]. In contrast, its impact on talent retention was relatively lower, given that it is affected by additional organizational and behavioral factors, which is consistent with the results of [43].

These results agree with foreign studies in emphasizing the importance of artificial intelligence and business intelligence, but they are distinguished by focusing on the integration between them within a single model, unlike most Arab studies that addressed these variables separately [28,29]. Thus, the study contributes to bridging a research gap, confirming that the true value of these technologies lies in their integration to support talent management decisions and enhance organizational competitiveness.

Recommendations

In light of the results of the study, a set of recommendations can be presented, represented by the following:

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1. Enhancing the integration between artificial intelligence and business intelligence, as organizations should not deal with these technologies separately, but rather work on integrating them within an integrated analytical system that supports decision-making related to talent.
2. Developing the data and analytics infrastructure, as the effective use of smart technologies requires the availability of accurate and up-to-date data, in addition to advanced analysis systems and information dashboards that support decision-makers.
3. Investing in developing employees' digital skills, as employees, especially in human resource departments, must be trained in using analysis and artificial intelligence tools, to ensure maximum benefit from these technologies.

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