Unlocking Business Intelligence and Data Analytics Adoption Patterns: Insights from Jordanian Higher Education Institutions

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ABSTRACT

There is a significant change in operational approaches, especially in business intelligence solutions, due to the application of modern technologies at Jordan's universities. However, further research is required. Faculty and staff are often reluctant to accept these technologies, as they are used to traditional teaching approaches. This highlights the importance of examining these change dynamics. To gain more insight into this issue, a questionnaire was created based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model and distributed to 587 participants in 12 prominent Jordan universities. Structural equation modeling was deployed to assess the fit of the model to the data and determine whether the hypothesized relationships are supported. The findings indicated that there was a strong behavioral intention among staff and faculty members to embrace business intelligence solutions in their professional roles. This study discusses the positive and negative factors that affect the adoption of business intelligence in Jordanian higher education institutions. It is widely believed that these variables are critical in university management as they help relevant individuals make informed decisions about future investments and implement new technologies into institutional practices.

Keywords-technology adoption; Business Intelligence (BI); higher education; organizational change; Unified Theory of Acceptance and Use of Technology (UTAUT) model

I. INTRODUCTION

Organizations can improve their competitiveness by implementing advanced technologies such as data analytics and business intelligence. These technologies simultaneously reduce labor and production costs, since they improve quality, simplify operations, and optimize company processes [1]. Organizational frameworks that incorporate business intelligence and data analytics are primarily driven by the desire to increase productivity, promote business expansion, and conform to industry standards while also fulfilling client needs [2]. According to [3], these factors are often used to determine whether the implementation of a new technology is feasible, helping management and organizations assess its benefits. In [4], Information Technology (IT), particularly business intelligence and data analytics, was shown to promote more efficient communication and optimization of business practices. However, organizations often struggle to manage change-averse employees when implementing new technologies [5]. To address this issue, the subtleties of individual behaviors and responses to technology adoption within their workplaces must be examined. Similarly, academic institutions have become more and more dependent on IT, especially since the early 2000s. Today, IT is progressing at a rapid rate. In line with this, business intelligence and data analytics are being implemented in many educational institutions to optimize their teaching and administrative processes [6]. The key aim of this transformation toward business intelligence and data analytics integration is to exploit the benefits of the technologies. This can facilitate:

- Enhanced decision-making through data-driven insights: academic institutions can use data to obtain important insights that can aid faculty members and administrators in

making better-informed decisions. In turn, this facilitates the development of effective policies and procedures [7].

- Improved operational efficiency: Workflows in educational environments can be streamlined utilizing business intelligence and data analytics tools. These tools promote task automation, improve productivity, and enable real-time monitoring of KPIs, which can lead to enhancements and smooth operational efficiency in all departments [8].
- Significant flexibility in response to market changes: Utilizing data analytics and business intelligence, academic institutions can adapt to changing market needs and educational environments. In addition, they can quickly change their products and strategies by analyzing trends, industry trends, and student preferences, which ultimately helps them increase their competitiveness [9].
- Predictive analytics can be facilitated for proactive problem-solving, as employing business intelligence and data analytics can help educational institutions determine potential obstacles and opportunities before they arise. By analyzing past events and identifying patterns, institutions can develop strategies to prevent potential problems, mitigate risks, and increase profitability [9,10].
- Improve resource allocation and cost control: Academic institutions can determine their resource utilization and financial efficiency deploying business intelligence and data analytics. This information can help them better allocate resources, plan budgets, and manage spending. In turn, this ensures that resources can be used effectively to achieve organizational goals and objectives [11].

However, embedding new technology is only possible if all employees are committed and enthusiastic about the process [13]. Accordingly, the adoption of new technologies by employees depends highly on how the former are perceived and the ability to improve performance in their specific roles [14, 15]. To effectively implement and use new technologies, a positive attitude and an understanding of the value proposition are required [16]. This study aims to investigate the complex changes that affect the adoption of business intelligence and data analytics tools in workplaces and provide a deeper understanding of their impact in terms of the amount of technology used in higher education organizational contexts. In more detail, the following objectives were established:

- Identify the various factors that affect the use of business intelligence and data analytics in an organizational setting.
- Examine the nuanced variations of these variables and explore their effects on people's decisions to use data analysis and business intelligence tools.

II. LITERATURE REVIEW

A. Information Technology Adoption and Challenges

Organizations can become more efficient by transforming company operations with the help of business intelligence and data analytics [5]. Modern technologies are becoming increasingly necessary for organizations. In [17, 18], individual impacts, organizational impacts, information quality, system quality, and user satisfaction were found to be critical for the effective integration of IT. Even with this knowledge, companies often find it difficult to integrate new technology successfully, which can result in issues such as low return on investment and underuse of IT solutions. In [5], it was found that IT adoption failures generally occur during development, when introducing the technology to employees, or during regular operations. This is especially true when IT projects are handled separately from staff engagement initiatives. Studies have shown that more than 70% of information system deployments ultimately fail [19].

Higher educational institutions employ different technologies and capabilities offered by business intelligence through the availability of large amounts of data that are integrated, analyzed, and used for better decision-making. Business intelligence is employed for student enrollment, academic performance, resource allocation, as well as improved strategic planning and operational efficiency. Several studies have examined the impact of business intelligence on higher education institutions. In [14], it was shown that universities use business intelligence tools and methods to better understand student behavior and its impact on retention rates. In [13], it was demonstrated that business intelligence facilitates effective resource management capabilities and planning, which leads to enhanced educational experiences. With many universities now offering online or hybrid courses, the use of IT, business intelligence services, and e-learning has become commonplace. Universities in Jordan are focusing on adopting different technologies to improve educational experiences, which requires improved use of ICT services, better employment for business intelligence solutions, and reduced resistance to change [20]. This study examines the factors influencing the adoption of business intelligence and data analytics in universities in Jordan.

B. Theoretical Framework

There is a clear shift in the ongoing organizational change process, which emerged due to the introduction of new IT. Many studies have revealed that employees often resist this change [8, 12, 14]. There are many factors affecting this resistance, such as fear of the unknown, skepticism about the perceived complexity of technology, concerns about the complexity of communication and processes, and the possibility of their replacement with technology. This hesitation is a major barrier that prevents users from adopting new practices and creates a significant obstacle to the implementation of new technologies in workplaces [12].

Several theories have been proposed to analyze the complexity of technology use. Well-known concepts, such as the Task-Technical Fit (TTF) model [21] and the Theory of Diffusion of Innovations (DIT) [22] have improved individuals' understanding of the adoption of new technologies. Recently, many conceptual frameworks have emerged that provide important insights into this complex phenomenon, such as the Technology Acceptance Model (TAM) [23], which has been widely used. Perceived ease of use and organizational usefulness are important determinants of technology adoption. TAM2 [24] extends this model by including a variety of variables, entailing psychological instrumental structures and

social influences, further enhancing a comprehensive understanding of user behavior. Furthermore, a unique model that resulted from the combination of acceptance theories and the use of technology model (UTAUT), provided additional information [12], involving Social Influences (SI), Expected Effort (EE), Facilitating Conditions (FC), and Performance Expectations (PE) variables. The UTAUT is a broad framework to test technology and provide a better understanding of its acceptance among users. User satisfaction and the practices behind technological adoption can be examined implementing models such as the Post-Adoption Model (PAM), which focuses on the enduring relationship between users and technology that extends beyond the accepted starting point [25]. Moreover, the Fit-Viability Model (FVM) provides important insights and new perspectives while emphasizing the importance of technology, business suitability, and sustainability in an organizational ecosystem [26]. This is an essential aspect that is often overlooked in traditional models and methodologies.

Given the rapid technological advances in recent years, people's understanding of the applied technologies should be strengthened by studying and developing rigorous theoretical frameworks. After exploring theories for comprehending IT adoption in organizational contexts, a consistent theme emerges, namely the impact of attitudes and beliefs about the adoption of new technologies on practices in real-world use. The TAM model is a well-established tool used to predict technology uptake and acceptance response [23]. Two factors, namely Perceived Usefulness (PU) and Perceived Ease of Use (PEU), are at the core of the TAM model. Although PEU measures the effort required to implement the technology, PU measures how technology improves productivity [24]. According to [24], the perceptions of users influence the perceptions of practices, which in turn impact how technology is utilized in organizations. However, the TAM model has been criticized for its shortcomings when it comes to adaptation to the changing technological environment and ignoring social implications [25]. The UTAUT framework combines several elements to address these issues, including behavioral intentions, technology use, facilitating conditions, and the effects of performance and effort expectations on behavioral intentions [12, 24]. In addition, many other models provide important technical insights for the adoption of technologies.

It is important to understand how innovations are adopted and distributed in social systems. This can be achieved with the Diffusion of Innovations (DIT) model [27]. DIT focuses on innovation adoption and diffusion, in which technology adopters are separated into different categories (i.e. innovators and laggards). Similarly, the theory of Task-Technology Fit (TTF) has also received considerable attention. TTF, which is the degree to which any technology's features align with users' jobs, ultimately determines how well they will be received and adopted. In turn, this helps to determine whether technical solutions are suitable for companies. This issue is also considered important, as post-adoption user experiences and satisfaction levels are carefully evaluated [21]. The Post Acceptance Model (PAM) improves individuals' understanding of technology adoption, as it considers variables such as support systems and user experiences [25]. Finally, the Fit-Viability Model (FVM) offers a unified alternative, estimating the feasibility of the technology in an organizational environment and its suitability for the tasks to be performed as a continuous process [26]. Furthermore, FVM emphasizes the importance of evaluating the overall organizational dynamics of technology adoption and acceptance, including industry and culture. The UTAUT model differs from the previously mentioned models in that it has detailed planning and strong forecasting power. This study examines the factors that affect the incorporation of business intelligence and data analytics into Jordanian educational institutions and the challenges that influence this adoption. Therefore, UTAUT was used because it is a comprehensive model that can be combined with multiple factors for technology adoption factors to be understood and predicted, as observed in Figure 1.

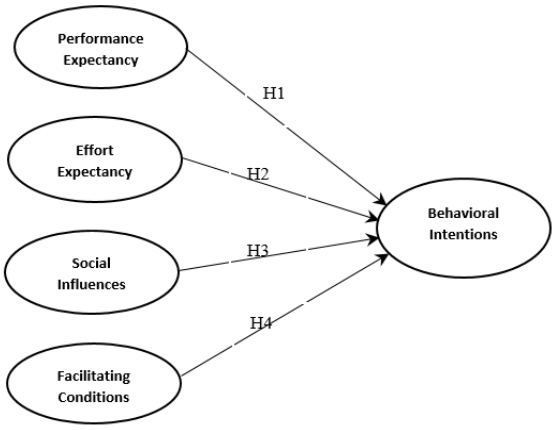

Fig. 1. UTAUT model.

This study examined the following hypotheses:

- Hypothesis 1: Behavioral Intentions (BI) to adopt business intelligence and data analytics services in Jordanian universities are influenced by Performance Expectations (PE).
- Hypothesis 2: BI to adopt business intelligence and data analytics services in Jordanian universities are influenced by Effort expectations (EE).
- Hypothesis 3: BI to adopt business intelligence and data analytics services in Jordanian universities are affected by Social Influences (SI).
- Hypothesis 4: BI to adopt business intelligence and data analytics services in Jordanian universities are influenced by Facilitating Conditions (FC).

III. RESEARCH METHODOLOGY

This study used Structural Equation Modeling (SEM) to analyze the relationship between the variables defined in UTAUT. SEM estimates direct and indirect effects, tests hypotheses, and examines the model fit to the data obtained from the questionnaire respondents. SEM is utilized along with a quantitative approach, which is important in dealing with this study's hypotheses in adopting business intelligence and data

analytics in Jordanian universities. Twelve universities in Jordan were selected based on a similar business-related environment to that of private universities in Jordan. A questionnaire based on UTAUT was developed, which was modified to comply with the intended UTAUT requirements and ensure the proper alignment of the survey instrument with the technologies under investigation (i.e., business intelligence and data analytics applications). Three questions were used to assess BI, while four questions were employed for each dimension in UTAUT. A 5-point Likert scale was deployed to explore user perceptions and attitudes. Furthermore, demographic information was included to enhance research findings and incorporate contextual analysis. A pilot test was conducted to ensure the reliability of the instrument.

A. Data Collection and Sampling Approach

The primary objective was to provide deep insights into BI that influence the adoption of business intelligence and data analytics in universities throughout Jordan. Twelve universities were selected. The website of each university was used to obtain the contact details of employees, ensuring a comprehensive representation. Personalized greetings with a link to the survey and a note highlighting the significance of voluntary participation were sent out. The instrument enabled subtle insights to be obtained and was completed online using Microsoft Forms. A total of 587 valid responses were collected and utilized in the subsequent analysis. Table I provides a detailed breakdown of the respondents' demographic data.

B. Data Analysis

The data collected were analyzed using SPSS V26 and AMOS v26.0 was deployed to perform SEM, which clarified the complex relationships among the independent and dependent variables within the research model. SPSS V26 accurately produced descriptive statistics. Table II shows a range of observations, with a mean of 2.67 at the lowest and 4.35 at the highest. This representation emphasizes the depth of understanding attained through the analytical process. Each construction had a Cronbach alpha score higher than 0.70. This high level of internal consistency indicates that the instrument is highly valid and reliable, which, in turn, strengthens the integrity of the research.

TABLE I. DEMOGRAPHIC RESULTS OF PARTICIPANTS

Category		Freq	%	Valid %	Cumulative %
Gender	Male	219	37%	37%	37%
	Female	368	63%	63%	100%
	Total	587	100%	100%	
Age group	Below25	19	3%	3%	3%
	25-34	51	9%	9%	12%
	35-44	283	48%	48%	60%
	45-54	207	35%	35%	95%
	More than 55	27	5%	5%	100%
	Total	587	100%	100%	
Educational level	Bachelor	28	5%	5%	5%
	Master	126	21%	21%	26%
	Ph.D.	433	74%	74%	100
	Total	587	100%	100%	
University type	Public	250	43%	43%	43%
	Private	337	57%	57%	100
	Total	587	100%	100%	
Business intelligence, service categories used	Reporting and dashboards	31	5.3%	5.3%	5.3%
	Content creation	489	83.6%	83.6%	88.9%
	Data integration and ETL (Extract, Transform, Load)	2	0.3%	0.3%	89.2%
	Data mining and predictive analytics	5	0.9%	0.9%	90.1%
	Data bisualization	38	6.5%	6.5%	96.6%
	Self-service BI	18	3.1%	3.1%	99.7%
	OLAP (Online Analytical Processing):	0%	0%	0%	99.7%
	Data warehousing	2	0.3%	0.3%	100
	Total	585	100.0 %	100.0%	
Work type	Academic	449	78%	78%	78%
	Managerial	129	22%	22%	100%
	Total	578	100%	100%	

TABLE II. STATISTICS OF THE CONSTRUCTS

Constructs	Items	Questions	Mean	SD	Cronbach *a*
Performance Expectations (PE)	PE1	Can business intelligence services prove beneficial in executing tasks relevant to my profession?	4.28	0.76	0.787
	PE2	Will the utilization of business intelligence services expedite task completion?	4.35	0.73	
	PE3	Is there a likelihood of enhanced productivity through the adoption of business intelligence services?	4.35	0.80	
	PE4	Will business intelligence services broaden my scope for acquiring more effective performance evaluations?	3.60	1.01	
Effort Expectation (EE)	EE1	Do I anticipate acquiring proficiency in business intelligence services within a short span?	3.85	0.63	0.894
	EE2	Do I foresee ease in navigating business intelligence and data analytics services?	4.25	0.83	
	EE3	Do I find the comprehension of business intelligence services straightforward?	4.12	0.76	
	EE4	Is the utility of business intelligence services transparent and conducive to task execution?	4.20	0.78	
Social Influence (SI)	SI1	Do influential colleagues advocate for my utilization of business intelligence services?	3.15	1.03	0.892
	SI2	Do key colleagues endorse my adoption of business intelligence services?	3.25	1.09	
	SI3	Has university management actively promoted the utilization of business intelligence services?	3.02	1.18	
	SI4	Does my university actively support the integration of business intelligence services?	3.45	1.32	
Facilitating Conditions (FC)	FC1	Are the requisite resources readily accessible for implementing business intelligence services?	3.60	0.72	0.753
	FC2	Do I possess the necessary knowledge to leverage business intelligence services effectively?	3.65	0.81	
	FC3	Is technical support available from university staff for utilizing business intelligence services?	2.67	1.21	
	FC4	Does the application of business intelligence services align well with my professional duties?	3.90	1.00	
Behavioral Intention (BI)	BI1	Do I anticipate incorporating business intelligence services into my workflow within the next six months?	3.97	0.87	0.85
	BI2	Do I foresee myself utilizing business intelligence services within the next six months?	4.17	0.92	
	BI3	Do I intend to incorporate business intelligence services into my operations within the next six months?	4.16	1.01	

C. Assessing the Measurement Model

Table III presents the findings using the AMOS v26.0 modeling program, evaluating the theoretical model using Composite Reliability (CR), detailed factor loading analysis, and Average Variance Extracted (AVE). The CR analysis displays that the model has a high degree of stability, ranging from 0.73 to 0.85. The established threshold was 0.70, a value supported by other studies and reported as consistent and reliable [12]. A closer examination of AVE and factor loadings indicates strong evidence of convergent validity, with values often exceeding the 0.50 threshold, ranging from 0.534 to 0773, which ensures that the process is rigorous and authentic. Table IV summarizes the findings, clarifying the discriminant validity conclusions for the five constructs under investigation. It is important to note that the values presented in the table are diagonal, corresponding to the square roots of AVEs, which are always higher than the off-diagonal values in the relevant rows and columns. These results confirm that the study has strong discriminant validity.

TABLE III. MEASUREMENT MODEL ASSESSMENT

Construct	Item	Loading	AVE	CR
PE	PE1	0.647	0.615	0.859
	PE2	0.960		
	PE3	0.894		
	PE4	0.903		
EE	EE1	0.756	0.631	0.772
	EE2	0.753		
	EE3	0.773		
	EE4	0.718		
SI	SI1	0.833	0.548	0.759
	SI2	0.813		
	SI3	0.710		
	SI4	0.667		
FC	FC1	0.754	5.34	7.386
	FC2	0.561		
	FC3	0.785		
	FC4	0.830		
BI	BI1	0.803	7.22	8.404
	BI2	0.839		
	BI3	0.878		

TABLE IV. CONVERGENT AND DISCRIMINANT VALIDITY

	PE	EE	SE	FC	BI
PE	**0.859**				
EE	0.742	**0.772**			
SI	0.494	0.303	**0.759**		
FC	0.594	0.617	0.711	**0.738**	
BI	0.698	0.590	0.473	0.667	**0.840**

D. Evaluating the Structural Model

This study applies a common method to determine the accuracy of the theoretical model. This is a two-stage method that has been developed based on SEM [28]. The first step is to create a measurement model, while the second step focuses on creating a structural model. Construct validity for the employed scales can be confirmed using the measurement model, which outlines how variables are represented by observable factors, mostly by Confirmatory Factor Analysis (CFA) [12]. It is not necessary to assess the structural model if the fit indices obtained from the scale's values in the measurement model exhibit low compatibility [28]. The measurement and the structural models are closely related and constitute the fundamentals of SEM, which is confirmatory by nature. Moreover, confirmatory factor analysis was implemented to statistically validate the theoretical model underpinning SEM. Figures 2 and 3 present the results produced by the measurement and structural models employed in this work.

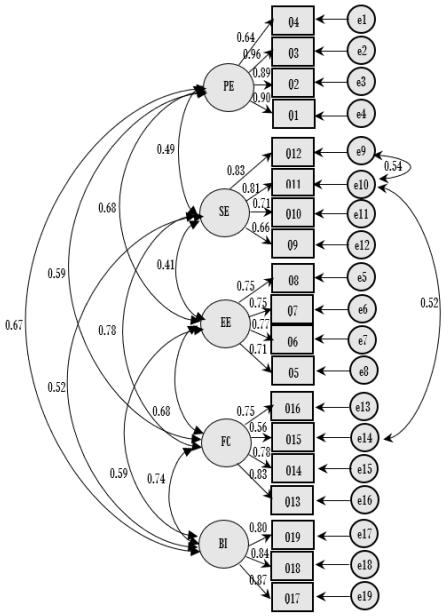

Fig. 2. Measurement model.

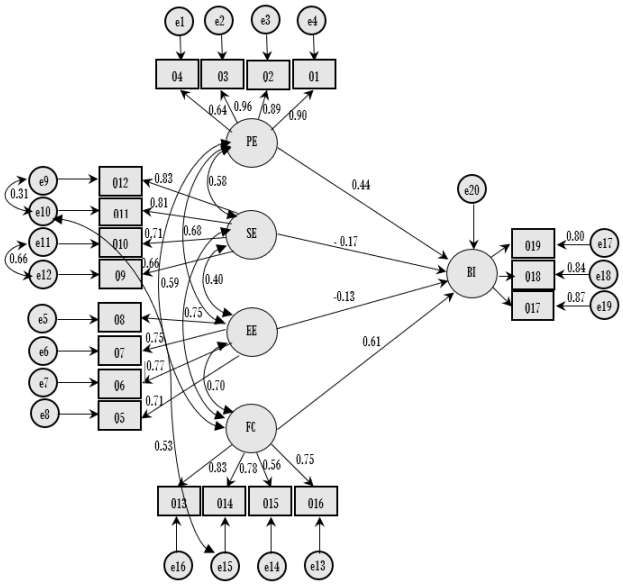

Fig. 3. Structural model.

Typically, SEM uses fit indices to assess the alignment between the model and data collected from the participants. Table V depicts the values identified for the fit indices.

TABLE V. FIT INDICES

CMIN/DF	1.586
RMR	0.073
GFI	0.813
AGFI	0.767
CFI	0.891
RMSEA	0.063

The CMIN/DF ratio represents the probability ratio (chi-square test), which is used to evaluate the agreement between the projected and actual models. A CMIN/DF ratio that falls below 3 indicates that the model's fit is reasonable [29]. Moreover, Degrees of Freedom (DFs) are calculated based on the number of observations in a model, which is then multiplied by the number of parameters being estimated. The Comparative Fit Index (CFI) compares the saturated model with the independent model by measuring how much of the variance and covariance are explained by the model. A good fit is indicated by values more than 0.90 in the CFI value range of 0 to 1 [12, 29]. In contrast, the Goodness-of-Fit Index (GFI) values can be calculated based on their relationship to the degrees of freedom, varying from 0 to 1. Better alignments are demonstrated by higher values [29]. The mean differences of expected degrees can be compared with the freedom within the population using the Root Mean Square Error of Approximation (RMSEA). The accepted RMSEA values range between 0.05 and 0.08 [28, 29]. The data show that the model fits well. PE positively influences BI (H1: Standardized Estimate Path Coefficient = 0.446, $p < 0.05$), as evidenced in Figure 3. Similarly, a positive effect is also noted in H4, which displays how FC affects BI, (H4: Standardized Estimate Path Coefficient = 0.618, $p < 0.05$). The findings support the rejection of H2 and H3, as they demonstrate the negligible effects of EE and SI on BI. Table VI outlines the results of the structural model evaluation.

TABLE VI. STRUCTURAL MODELLING RESULTS

Hypothesis		**Unstd. est.**	**Std. est.**	**S. E.**	**t-value**	**P**	**Result**
H1	PE→ BI	0.625	0.446	0.204	3.136	0.002	Supported
H2	SI→ BI	-0.137	-0.171	0.171	-0.967	0.506	Rejected
H3	EE→ BI	-0.166	-0.129	0.232	-0.764	0.510	Rejected
H4	FC→ BI	0.683	0.618	0.233	2.669	0.003	Supported

IV. FINDINGS AND DISCUSSION

The results of the data analysis confirm hypotheses H1 and H4, showing that individuals at Jordanian universities have a strong BI to use data analytics and business intelligence services in their daily practices. Regarding performance expectancy, the question "Is there a likelihood of enhanced productivity by adopting business intelligence services?" was the most popular question. With a mean score of 4.35 and an SD of 0.80, it was clear that most respondents thought there was a good chance that business intelligence services would boost productivity. Although the respondents generally exhibit positivity, there are differences in their confidence levels, which are most likely caused by factors such as their previous experience, the organizational environment, and how difficult they anticipate the implementation to be. The SD highlights the differing opinions of the respondents, revealing different levels of confidence in the contribution of business intelligence services to increased productivity. This variation stresses the need to develop more customized strategies to deal with particular issues and ensure broad support for business intelligence projects [30]. Empirical evidence demonstrates that business intelligence and data analytics can improve efficiency by facilitating resource sharing, teamwork, and performance enhancement. With a majority leaning towards agreement (mean of 4.35), the result reveals that the same features significantly influence respondents' perceptions of how business intelligence services affect task completion speeds. The SD of 0.730 suggests notable variability in opinions, including human characteristics, organizational circumstances, positive user experiences, perceived benefits of business intelligence services, and alignment between expectations and reality. In turn, this implies that participants' perceptions of the impacts of business intelligence services on task completion speed are greatly influenced by specific business intelligence service components, with most participants agreeing to some extent with the question "Do you think task completion can be expedited through the use of business intelligence services?" [31].

The third highest mean was identified for the question "Can business intelligence services prove beneficial in executing tasks relevant to my profession?", with a mean score of 4.28 and an SD of 0.76. In turn, this value indicates that participants generally agree that business intelligence services can expedite the completion of tasks in their profession. This suggests that participants perceive positively the value of business intelligence services in their work. However, SD indicates some variation in the participants' perspectives, which is possibly caused by the respondents' strong agreement or disagreement, even if the average response tends toward agreement. Although there can be differences in individual perspectives, respondents tend to perceive positively the advantages of business intelligence. This agreement results from the scalability and flexibility that business intelligence and data analytics services provide. These features facilitate the selection and modification of services employed to carry out managerial and educational tasks. Moreover, they are supported by a variety of data sources that are subject to data analysis [30]. The final question in this category is "Will business intelligence services widen my scope for acquiring more effective performance assessments?". This question has a mean score of 3.60 and an SD of 1.01, indicating that participants' perceptions of the effectiveness of business intelligence for performance improvement in educational institutions in Jordan are largely unbiased. This uncertainty stems from factors, such as organizational resistance to change, cultural attitudes, inertia, and lack of knowledge about business intelligence. Several factors are needed to address these issues, such as providing training on business intelligence services, the use of success case studies, endorsing organizational adjustment, eliminating cultural challenges, and engaging stakeholders on the importance of technology adoption [32].

A notable finding concerned FC: "Does business intelligence services align with my professional duties?". The highest mean was 3.90, and SD was 1.0. This highlights the importance of business intelligence and data analytics in

educational organizations, where data use is critical for making judgments based on data insights. Alignment is determined by specific respondents agreeing that business intelligence fits well with their responsibilities. Despite the variety of responses, most participants considered business intelligence an effective tool in their work, indicating that they perceive it a good match. Several factors contribute to the previous results. The importance of business intelligence and its ease of integration into the educational workflow, the provided training and support, its perceived advantages, the cultural endorsement, and the wide capabilities offered by business intelligence tools possibly contribute to this convergence [31, 32]. With an SD of 1.21, the question "Is technical support available from university staff for utilizing business intelligence services?" had the second-highest mean in this category. Business intelligence services are becoming increasingly important for data-driven decision-making in modern academic environments, which highlights the need for technical support. Complex business intelligence technologies can be difficult to use and, thus, access to technical support is essential. Most universities in Jordan provide this type of support, which empowers staff and students to use business intelligence services and reduces downtime resulting from user confusion and technical problems. In turn, this increases the institution's productivity [32]. The question "Do I have the knowledge required to use business intelligence services effectively?" achieved a mean score of 3.65 and an SD of 0.810. This highlights the increasing adoption and acceptance of business intelligence and data analytics in Jordanian universities. The last question in the category is "Are the requisite resources needed to implement business intelligence services readily available?", which received the lowest mean score of 2.67 and an SD of 0.72. This implies a great deal of variability in participants' perceptions of resource accessibility when implementing business intelligence services. Furthermore, the mean value indicates that participants generally perceive these resources to have low availability, while the SD implies significant variations in individual opinions. It is evident from the responses that participants have differing opinions regarding whether the necessary resources are readily available or not. The concept received a low mean score, indicating that access to the resources required to implement business intelligence services is hindered in some way.

However, the variability in responses also indicates that the situation may not always be perceived the same by all participants. Faculty and staff have strong behavioral intentions to use business intelligence and data analytics services in their work over the next six months, based on the results related to BI. Moreover, the participants' desire to employ business intelligence services in the next six months to help with work-related tasks was found to be modest, with a mean score of 3.97 for the question "Do I intend to use business intelligence services in my work in the next six months?". Many factors can help improve future adoption, including comprehensive training and helping staff to use business intelligence technologies efficiently. Furthermore, highlighting the advantages and simplicity of business intelligence in the workplace through individualized trials or demonstrations can help promote business intelligence software that is catered to suit the different departments or roles in question [31]. The average response to the question "Do I foresee myself utilizing business intelligence services within the next six months?" was 4.17, which suggests that respondents are likely to use business intelligence services in the near future. It is recommended that organizations improve the accessibility of business intelligence tools to promote their adoption. This may involve making investments in mobile adaptability, simple dashboards, and user-friendly interfaces that provide important insights [32]. Furthermore, employees should be provided with frequent training to be encouraged to use business intelligence technologies. Meanwhile, it is possible to enhance utilization rates by developing a data literacy culture [31]. The final question was "Do I plan to incorporate business intelligence services into my work in the next six months?", which generated a mean score of 4.16. This finding indicates that participants were positively inclined to use these services in their work within the next six months. It is also important for organizations to prioritize business intelligence projects with crucial business-related goals to increase the rates of technological adoption. To achieve this, the benefits of business intelligence services (particularly in terms of improving their decision-making skills, streamlining workflows, and promoting company growth) must be clarified and highlighted. Furthermore, business intelligence insights can be easily implemented by promoting cooperation between departments and facilitating cross-functional team utilization. It is possible to further increase adoption rates by providing ongoing support and assistance to help employees overcome any problems that arise during implementation [30, 32].

The findings were unable to identify a correlation between EE and SI with BI to exploit business intelligence services and technologies, which is contrary to predictions. On the other hand, the results indicate that there are two key factors influencing Jordanian higher education institutions' intentions to employ business intelligence and data analytics, namely PE and FC, as defined by H1 and H4. It is interesting to note that the findings on the perceived benefits of PE (i.e., improved strategic planning and decision-making) are prominent and highlight the need to facilitate access to resources and organizational support. However, enhancements can be made to improve SI, which can be achieved through the presentation of success stories and the introduction of peer networks. EE is also important here, as adopting simple interfaces and providing user-friendly training can enhance the results. The findings show that the UTAUT model was able to highlight factors influencing the acceptance of business intelligence and data analytics in Jordanian universities, along with PE and FC, as giving priority to SI and EE can promote innovation and enhance decision-making practices.

V. CONCLUSION

Universities around the world are making efforts to adopt new technologies and close the gap in current market practices by making significant investments. In turn, it is hoped that this will ameliorate productivity, value, and competitiveness. Nonetheless, many challenges can hinder technological adoption, such as staff's resistance to change, which is

commonly observed in both Western and Jordanian universities. This study examined the factors that affect individuals' behavioral intentions to adopt new technologies, specifically business intelligence and data analytics services. This is critical in Jordan, given the influence that cultural and social practices have on university operations. The findings indicate that employees are more likely to use business intelligence services if they foresee that the technology will help them perform better at work. To encourage best practices and quality, university administration should promote this adoption through the implementation of specific regulations, rewarding employees for their digital efforts with rankings and incentives, and providing targeted training geared toward task-oriented solutions. This study was unable to identify a correlation between EE and SI with BI to utilize business intelligence services, which is contrary to predictions. However, this study enriches existing theories that focus on the UTAUT model. Theoretical insights obtained through the UTAUT model and existing literature enable individuals to further understand the variables that affect technology adoption at universities, especially in Jordan. In terms of practicality, the research findings can be used to help company managers in Jordan understand the dynamics of business intelligence and data analytics services, enabling them to make informed strategic decisions and investments in education while also improving their performance and increasing the quality of national educational and managerial services.

Due to the time limitations and financial constraints of this research, future studies should focus on larger samples and comparative studies between Jordanian universities on the adoption of business intelligence and data analytics. Furthermore, the inclusion of different variables related to technological infrastructure, financial investment levels, and external political and economic factors should be examined.

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