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Business Intelligence Systems and E-Service Quality: The Mediating Role of E-Business Capability

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ABSTRACT

This study examines the effect of Business Intelligence Systems (BIS) on e-service quality and investigates the mediating role of e-business capability in this relationship. Grounded in the Resource-Based View (RBV) and IS Capability Theory, the study argues that the value of analytical systems is realized when data-driven insights are translated into digitally enabled service processes. A quantitative cross-sectional design was employed, and data were collected from 197 professionals working in Jordanian organizations that use BIS or e-business platforms. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to test the measurement and structural models. The results show that BIS has a significant positive effect on e-business capability, which in turn exerts a positive effect on four dimensions of e-service quality: availability, reliability, responsiveness, and user satisfaction. The mediation analysis further indicates that e-business capability partially transmits the influence of BIS on service outcomes. These findings suggest that analytical infrastructure alone is insufficient to improve digital service performance unless it is supported by strong operational e-business capability. The study extends the literature on BIS and digital service delivery by clarifying the mechanism through which analytical systems create service value and provides practical guidance for organizations seeking to improve online service quality through data-driven capabilities.

1. INTRODUCTION

The digital change has essentially altered the way organisations operate, the way services are delivered and how customers interact with them, which has made e-business one of the key pillars of the modern day economic activity. As companies continue to move services and processes to digital platforms, consumer demands put on reliability, responsiveness, availability, and smooth interaction of companies are growing [1]. These expectations are further compounded by the swift growth of the online scene, electronic payment systems, and mobile applications that put pressure on organisations to maximize service experiences and at the same time handle high amounts of real-time data [2, 3]. It seems in this regard that the capacity to derive meaning out of information and transform it into service and operational value has become a hallmark feature of digital competitiveness.

Business Intelligence Systems (BIS) have become platforms of strategic enabling data-driven decision-making and service innovation. BIS combines data extraction, storage, processing, and analytics to offer operational insights that can be used to aid in strategic planning, optimisation of resources, and customised digital services [4, 5]. In the contexts of e-business, BIS improves the ability of an organisation to observe the behaviour of customers, identify the service problems, personalise online interactions, simplify business processes and improve the overall user experience [6]. Although the positive relationships between BIS and organisational performance have been proven by previous research [2, 6], much less is known about the effects of BIS on e-service quality as a multidimensional concept (including the reliability, responsiveness, availability, and user satisfaction) [7, 8].

One of the weaknesses of current studies concerning BIS is that they are usually considered as single technologies and not

as parts of a bigger digital infrastructure. The quality of the digital service delivery is not only created by the presence of the analytical tools, but the successful transformation of the intelligence into effective online process, workflow, and service interactions in the organisations. Such conversion is operationalised with the help of e-business capability that is an indicator of the capacity of an organisation to implement digital platforms, data streams integration, process automation, and real-time service operations support. E-business capability therefore is not merely a technological capability but also an organisational capability that connects digital intelligence with the service outcomes that are facing the customers.

Theoretically, this mediating position concurs with the Resource-Based View (RBV) and IS Capability Theory, which argues that technologies only can create value proceeding to organisational capabilities that facilitate coordinated action, knowledge exchange, and service improvement. Even though the informational resources are offered by BIS, E-business capability is the complementary power that helps to enhance reliability, availability, and responsiveness in the delivery of digital services. In spite of this solid theoretical basis, available studies have not explored the impact of the joint influence of BIS and e-business capability to determine the quality of e-services systematically. As a result, the processes of data intelligence-digital service performance connection are shredded and undeveloped.

Moreover, empirical research relating BIS to service performance tends to focus on broad performance measures or generic measures like the perceived usefulness. The conceptual inconsistencies have been created by the intermittent use of the Technology Acceptance Model (TAM) constructs, which are meant to be used at individual level of technology adoption, when the construct is applied to organisational service processes. Therefore, it needs a more consistent theoretical conceptualization, the one that would make BIS analytical enablers, e-business capability the conduit of operation, and the e-service quality the multidimensional output.

The methodological nature of the literature review on the effects of BIS is often based on descriptive statistics or regression-based designs, with very little application of structural equation modelling to test multidimensional constructs and mediation processes. The area of the research is in developing digital economies, but there is a paucity of such a study, along with the peculiar challenges and opportunities facing such settings. Jordan, with its fast digital growth and poor integration of analytics, can be used as an empirical setting to explore how BIS can influence the nature of digital service delivery in practice.

These holes point to a more integrated and empirically-based model. To begin with, the research that has been conducted in the field does not have a detailed theoretical account of how BIS affect the different dimensions of e-service quality. Second, the mediating position of e-business capability albeit theoretically supported has not been established empirically. Third, not many studies have utilized sophisticated modelling methods like PLSSEM to test these relations in the new digital markets.

In the answer to these gaps, this research formulates and validates a model that places the e-business capability as a mediating variable that position BIS as improving four essential dimensions of e-service quality, which are availability, reliability, responsiveness, and user satisfaction. Through this, the research contributes to the theoretical body of knowledge of the interaction between digital intelligence and operational capabilities to influence the service outcomes and offer useful recommendations to organisations aiming to use BIS investments in enhancing digital service delivery.

2. LITERATURE REVIEW

2.1 Importance of e-business in digital service delivery

E-business has significantly transformed the manner in which organisations design business processes, provide services to the customers and their interactions with the customers. It involves a broad-based online activities such as online transactions, electronic communication and web based service delivery, which is facilitated by internet technologies and integrated platforms [9]. The rising levels of internet penetration, mobile connectivity, and the popularization of digital experience have heightened the expectations of consumers in terms of personalized, seamless, and convenient online experiences [1]. Consequently, e-business has helped organisations to break geographical barriers, access international markets and individualise services to distinct customers besides enhancing efficiency in operations.

Moreover, e-business strengthens the coordination of internal operations, minimizes costs of operation, and shares data with departments and supply chains partners [2]. However, technological sophistication can be not the only key to success; the ability to sustain an e-business rests on the fact that a high-quality, reliable, and responsive digital service should be provided that is of equal or even higher quality compared to what the user expects [10]. With the substitution of traditional face-to-face service encounter with digital interactions, the quality of service is one of the key determinants of competitive advantage.

2.2 Business intelligence and its strategic role in e-business

BIS have taken their place on the ground as the backbone infrastructures that underlie informed decision-making and business excellence in the e-business settings. BIS combine data of various types, such as transaction logs, website analytics, customer activity, social media, and market indicators into actionable insights [4, 5]. BI is an integrated process in the field of information technology and converts raw data into meaningful intelligence, which is useful in forecasting, real-time decision-making, and performance evaluation [6].

BIS are executed in digital service settings, so they allow customisation of customer experience, identify services breakages and service bottlenecks, optimise product suggestions, automate decision-making, and assist predictive customer needs [3].

The literature however gives varying results. Other studies state that direct BI has strong effects on service performance and competitive advantage [7] and others point out that the value of BI is related to the maturity of the organizational readiness to it, integration of platforms, and the maturity of digital capabilities [8]. These inconsistencies indicate that BIS is not sufficient to enhance better service results and rather they rely on complementary organizational resources that convert analytical understanding into operationally enhanced

results.

This substantiates the argument that BIS are required but not enough-value only comes to pass when insights are passed through digital processes facilitated by robust e-business capabilities.

2.3 Dimensions of e-service quality in digital platforms

The quality of e-services represents the overall efficiency of a digital platform to meet customer expectations within the system of online interactions. Unlike traditional service interactions that are too dependent on human interactions, online interactions are based on system reliability and responsiveness, platform availability and user-centric design to provide a positive customer experience. The literature identifies four dimensions and these are reliability, responsiveness, availability and user satisfaction, which are routinely cited as the four key determinants of e-business performance.

2.3.1 Reliability

Reliability refers to the level at which an online platform is able to provide the correct, reliable and error free service on a regular basis. This includes accurate order handling, delivery in a timely manner, data security, and stability in system performance between different devices and sessions [11]. On the web, a customer puts his trust entirely in the technology having completed the transaction; therefore, any failure, whether in payment, improper order particulars or sluggishness of the system, destroys trust immediately. The high reliability will allow users to be very sure that the platform is functioning as expected and this will motivate them to make repeat purchases and customer loyalty emergence [12]. The issue of reliability forms the basis of sustained online interactions as trust continues to take a center stage in online interactions.

2.3.2 Responsiveness

Responsiveness reflects the agility and effectiveness with which a digital platform or its service provider responds to customer queries, fixes problems and responds to service requests. In online business, which can be characterized by quickness in expectations, promptness is a critical point of divergence. The use of technologies like AI-based chatbots, live chat support, automated help centers, and adaptive self-service portals can help organisations to fulfil such expectations [3]. Responsiveness effectively reduces customer frustration, promotes perceived value and increases emotional attachment to the platform. Whenever a customer has their problems resolved promptly, they develop a higher tendency to use the same service again and also refer others to the services.

2.3.3 Availability

Availability is the ability of a platform to achieve constant access to digital services with limited interruption or downtime. It indicates the stability of the server, the availability of the system, the stability of the network and the possibility of using it with a variety of devices and across geographic boundaries [10]. Even short-lived downtimes may trigger lost sales, negative feedbacks, and reduced user confidence. Customers are likely to move rapidly to other platforms when they have access problems at such competitive digital markets. Thus, maintaining high availability is not merely a technical necessity, but also a strategic one, necessary in order to provide customers with a sense of satisfaction and retain the platform competitiveness.

2.3.4 User satisfaction

User satisfaction is the overall evaluation of customers in terms of digital experience, which includes the perceived ease of use, the quality of interface, personalization, emotional attachment, and compatibility with expectations [12]. Users who have been satisfied consider the platform to be user-friendly, effective, and helpful in meeting their needs. Considering that online users are faced with very low switching costs, customer satisfaction becomes a vital issue in retaining customers and preventing churn. High satisfaction by the users leads to repeat usage, positive word of mouth, increased preference to buy further services and increased customer loyalty. Combined together, these four dimensions offer an entire scale of performance measurement of digital services. They form the main outcome variables in the current study in which the effect of Business Intelligence System and e-business capability are studied.

3. RESEARCH METHODOLOGY

The current paper has employed quantitative and cross-sectional research design as the method to explore the interactions between BIS, e-business capability, and the four dimensions of e-service quality in Jordanian organisations empirically. This design was suitable because the study attempted to test theoretically based relationships and quantify latent constructs through a system of structured indicators [13, 14]. The target population consisted of professionals working with the companies involving the use of BI tools, or running e-business platforms because these individuals have the necessary experience and working knowledge of digital-based systems and data-feed-driven service settings. Since BI and e-business professionals could not be easily identified using the public records or random sampling frames, simple random sampling based on probability could not be adopted. This paper thus used a non-probability purposive sampling method, with a snowball technique; this sampling method is advised in the research of information systems studies where the respondents are supposed to have specialised technical and organisational expertise [15, 16]. The participants were recruited through LinkedIn professional groups, business networks, industry groups, and recommendations of the first respondents. In total, 350 questionnaires were distributed online, and the number of completed and valid questionnaires amounted to 197, and this will provide a response rate of 56.3, which is the minimum of the recommended sample size in PLS-SEM analysis.

The measurement tool was developed based on reliable scales obtained through the previous research. The measurement of BIS was done on items modified based on Popovic et al. [5] and the items addressed analytical ability, data quality, and utility of findings made by BI tools. Constructs based on digital capability and IS capability frameworks [17-20] identified to measure e-business capability (digital integration, automation, process coordination, and real-time service enablement) were used to measure e-business capability. Items modified to use the Wilson et al. [14] and Shabani et al. [15] scales were used to measure the four dimensions of e-service quality, which

included reliability, responsiveness, availability, and user satisfaction. Each of the items was rated using a five-point Likert scale, that is, 1 (strongly disagree) to 5 (strongly agree). Academic experts and practitioners with expertise in BI and digital service systems were consulted to rectify any ambiguity and content invalidity of the instrument. To determine the level of understanding of the item, structural clarity, and reliability a pilot study comprising of 30 respondents was carried out, with some minor changes being made to improve the wording and the measure accuracy [21].

The research followed a positivist philosophical orientation, which focuses on objective measurements and empirical validation of the hypothesised relationships among BIS, e-business capability and e-service quality. The data were estimated with the help of the Partial Least Squares Structural Equation Modelling (PLS-SEM) in SmartPLS 4.0, which is an appropriate method to assess complex models with numerous latent variables and a mediation effect [15]. The analysis took place in two major phases. The measurement model was then tested through the measurement of indicator reliability, composite reliability, convergent validity using average variance extracted (AVE), and also by measuring the discriminant validity using fornell larcker criterion and also through heterotrait-monotrait ratio (HTMT) ratio. Second, the structural model was evaluated by estimating path coefficients, bootstrapping significance levels, coefficients of determination (R^2), effect sizes (f^2), predictive relevance (Q^2), and global model fit with the help of SRMR index. This methodological approach made sure that the conceptual framework is rigorously tested and provided solid evidence regarding the reliability, validity and explanatory power of the measurement and structural models.

4. DATA ANALYSIS AND RESULTS

SmartPLS 4.0 was used to analyse the data based on the PLS-SEM, which is especially appropriate in case of exploratory research and the use of a large number of latent constructs. It is best used on medium sized samples e.g. the 197 valid cases under this inquiry. The analysis followed the two-step process suggested by the previous studies [16-18], as it included first the assessment of the measurement model and then the assessment of the structural model.

In order to determine construct validity and reliability, Cronbach alpha, composite reliability (CR) and AVE were calculated. These indicators were all more than the traditional thresholds: Cronbach alpha values were higher than 0.70, CR was higher than 0.70, and AVE was higher than 0.50 which proved internal consistency and convergent validity.

The constructs were obtained through the existing literature: BIS were borrowed in Popovič et al. [5], e-business was borrowed in the view of existing frameworks of digital transformation, and dimensions of service quality were borrowed in Wilson et al. [14] and Shabani et al. [19]. The compliance to the discriminant validity was confirmed by both FornellLarcker criterion and the HTMT ratio where all values fell within the acceptable limits. The importance of the path coefficients was checked by bootstrapping (5,000 resamples) and the model fit statistics, such as standardized root mean square residual (SRMR), was used to check the overall adequacy of fit.

The Business Intelligence (BI), e-business and service quality data analysis was conducted using SmartPLS software [16, 18]. This is a tool based on PLS-SEM, which is especially appropriate in case of exploratory research, including this one. The ability to manage fairly small samples with a significant amount of statistical power can be identified as one of the salient strengths of PLS-SEM. In addition, SmartPLS also allows simultaneous evaluation of the structural and measurement models, which include inter-construct relationships, and how the items of the survey reflect the underlying constructs; all needed elements of a complex PLS-SEM analysis [17]. The structural equation modelling method is the one that is preferred to use when interacting with complex models with latent variables, as Djerdjouri [20] observed.

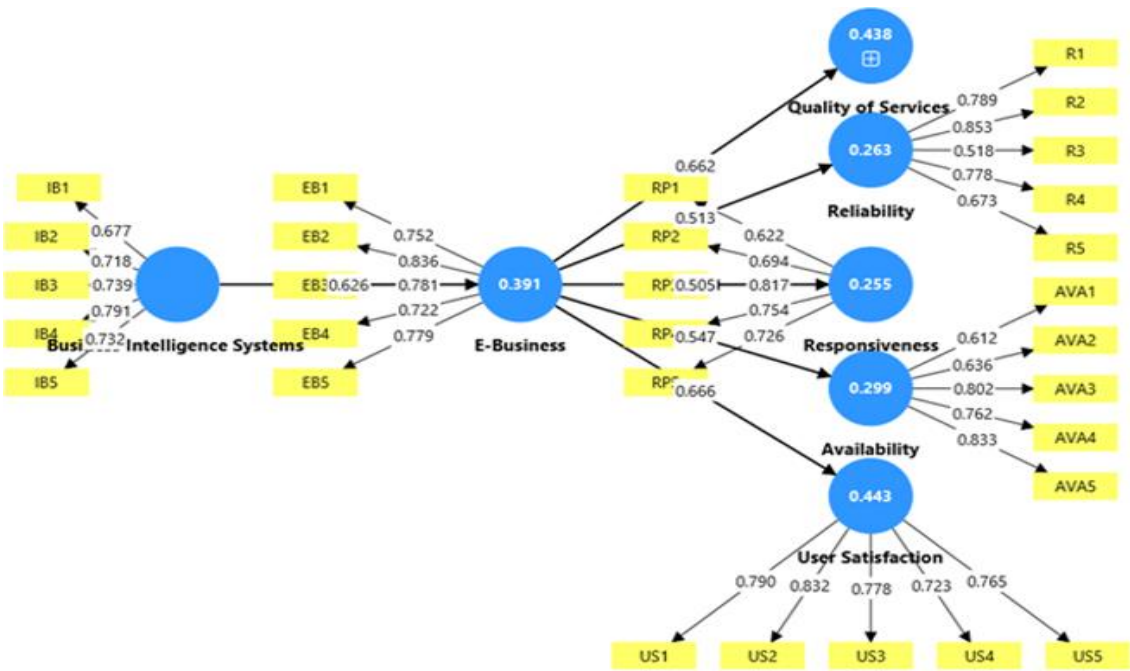

Figure 1. Measurement model

A systematic assessment of the measurement model was conducted according to the best practices by reliability and validity tests, such as item loading, convergent, discriminant, and internal consistency, in order to assess the model [22]. To ascertain that the study met the methodological standards, the confirmatory factor analysis (CFA) was performed. Fit indices were evaluated in addition to item factor loadings and construct correlations to determine the correspondence between the observed variables and the latent constructs they measure [23]. A high level of factor loadings is an indication of strong relations between items and their constructs, thus ensuring the construct validity [24].

Given the existing rules, only the factor loadings that were greater than 0.70 were considered to the final analysis, based on the traditional rules of the indicator reliability. Seven items, AVA1, AVA2, IB1, RE3, RE5, PR1 and PR5, did not pass this threshold and were then dropped in order to increase the accuracy and parsimony of the measurement model. The rest of the seven items showed strong convergent and discriminant validity and have a definite and statistically significant factor structure [25].

The completed measurement model is presented in Figure 1.

Table 1. Construct reliability and validity

Code	Variables		Cronbach's Alpha	Composite Reliability	Average Variance Extracted	R^2
AVA3		0.802				
AVA4	Availability	0.762	0.789	0.852	0.539	0.299
AVA5		0.833				
EB1		0.752				
EB2		0.836				
EB3	E-business	0.781	0.785	0.852	0.536	0.309
EB4		0.722				
EB5		0.779				
IB2		0.718				
IB3	Business Intelligence	0.739	0.833	0.882	0.600	0
IB4		0.791				
IB5		0.732				
R1		0.789				
R2	Reliability	0.853	0.773	0.849	0.535	0.263
R4		0.778				
RP3		0.817				
RP4	Responsiveness	0.754	0.773	0.847	0.527	0.255
RP5		0.726				
US1		0.790				
US2		0.832				
US3	User Satisfaction	0.778	0.837	0.885	0.606	0.443
US4		0.723				
US5		0.765				

Table 2. Heterotrait-monotrait ratio (HTMT) discriminant validity

Construct	1	2	3	4	5	6	7
Availability	-	-	-	-	-	-	-
Business Intelligence Systems (BIS)	0.653	-	-	-	-	-	-
E-business	0.640	0.760	-	-	-	-	-
Quality of Services	0.739	0.743	0.729	-	-	-	-
Reliability	0.869	0.793	0.637	0.805	-	-	-
Responsiveness	0.801	0.854	0.618	0.704	0.790	-	-
User Satisfaction	0.808	0.880	0.787	0.764	0.777	0.746	-

Table 3. Fornell–Larcker discriminant validity

Construct	1	2	3	4	5	6
Availability	0.734					
E-business	0.640	0.733				
Business Intelligence	0.653	0.760	0.774			
Reliability	0.739	0.729	0.793	0.732		
Responsiveness	0.801	0.618	0.854	0.790	0.726	
User Satisfaction	0.808	0.787	0.880	0.777	0.746	0.778

The last item loadings were between 0.718 and 0.853 with satisfactory CR and AVE values. The results support the internal consistency and construct reliability of the model as the latent variables are being represented well by their respective indicators, as shown in Table 1. As proposed by Henseler et al., discriminant validity was examined using the HTMT procedure as shown in Table 2.

The FornellLarcker criterion is presented in Table 3 and shows that all the constructs in the model have established the full establishment of the discriminant validity. The square root of the AVE of every latent variable was higher than the correlations concerning any other variable, which shows that every variable has more variance with its indicators as

compared to the correlations of the variables with indicators of other constructs. As an example, Availability (AVE = 0.734) has a higher correlation with E-business (0.640), Business Intelligence (0.653), Reliability (0.739), Responsiveness (0.801) and User Satisfaction (0.808) than it has with them. Similarly, the e-business (0.733) cannot be compared with the rest of the correlations and therefore exhibits sufficient uniqueness. These findings confirm that the latent constructs have distinct dimensions of the conceptual model and they can be empirically discriminated against each other, meeting conventional demands of a discriminant validity in PLS-SEM.

Table 4. Model fit and predictive accuracy indicators

Fit Indicator	Value	Recommended Threshold	Interpretation
SRMR (Standardized Root Mean Square Residual)	0.062	< 0.08 (Hair et al., 2021)	Acceptable global model fit
R^2 – Availability	0.299	> 0.10 = moderate	E-business moderately predicts Availability
R^2 – Reliability	0.263	> 0.10 = moderate	E-business moderately predicts Reliability
R^2 – Responsiveness	0.255	> 0.10 = moderate	E-business moderately predicts Responsiveness
R^2 – User Satisfaction	0.443	0.26 = substantial (Cohen, 1998)	Strong explanatory power
R^2 – E-business Capability	0.309	> 0.10 = moderate	BIS strongly predicts e-business capability
Q^2 (Predictive Relevance)	> 0 for all constructs	> 0 indicates predictive relevance	Model has strong predictive accuracy
f^2 – BIS → E-business	Large	0.35 = large	BIS has strong effect on e-business
f^2 – E-business → Availability	Medium	0.15 = medium	Meaningful effect
f^2 – E-business → Reliability	Medium	0.15 = medium	Meaningful effect
f^2 – E-business → Responsiveness	Medium	0.15 = medium	Meaningful effect
f^2 – E-business → User Satisfaction	Large	0.35 = large	E-business strongly drives Satisfaction

The model fit indicators are also depicted in Table 4 to prove that the PLS-SEM structural model fit all the suggested criteria of acceptable fit and predictive accuracy. The SRMR 0.062 is less than the set standard of 0.08, which validates an acceptable good global model fit and implies that there is a weak disagreement between observed and model-implied correlations. The R^2 values of the endogenous constructs are moderate (Availability, Reliability, Responsiveness) and high (User Satisfaction, E-business Capability) which indicate that the model explains a significant percentage of variance in the service quality dimensions. All Q^2 values exceed zero, which supports the relevance of strong predictive; however, the effect size values (f^2) show that BIS have large impact on E-business Capability, E-business Capability has medium-large impact on the different outcomes of service quality. Together, these findings indicate that the model has statistical, theoretical and predictive abilities of the hypothesised relationships in the conceptual framework.

To evaluate the structural relationships between the research factors, a bootstrapping process that used 5,000 iteration was carried out. The outcome obtained showed a number of statistically significant positive correlations thus affirming the proposed relationships as summarised in Table 5.

Table 5. Hypotheses testing

Hypo	Path	Original Sample (O)	Stdev	T	*P*
H1	Business Intelligence Systems (BIS) -> e-business	0.626	0.050	12.429	0.000
H2	E-Business -> Availability	0.547	0.048	11.302	0.000
H3	E-Business -> Quality of Services	0.662	0.040	16.487	0.000
H4	E-Business -> Reliability	0.513	0.060	8.582	0.000
H5	E-Business -> Responsiveness	0.505	0.056	8.963	0.000
H6	E-Business -> User Satisfaction	0.666	0.045	14.810	0.000

The structural model analysis was supportive to an extent that all the six hypotheses were met and this showed that BI and e-business mediated in all aspects of improving quality of e-services.

H1 was accepted which showed the existence of a statistically significant and strong positive correlation between BIS and e-business activities (B = 0.626, t = 12.429, p < 0.001). This observation testifies to the fact that BI tools support strategic planning, real time decision making and operational efficiency, which in turn improve e-business operations.

H2 was also affirmed, which showed that e-business has a significant positive impact on service availability (B = 0.547, t = 11.302, p = 0.001). This implies that the e-business infrastructures can be mature and help organizations to offer consistent and trustworthy digital services. In accordance with H3, the e-business and overall service quality showed a significant positive correlation (B = 0.662, t = 16.487, p = 0.001), which confirms that the digital business transformation positively affects the level of service performance.

H4 was that e-business has a positive impact on the reliability of the system, and the data proved that (B = 0.513, t = 8.582, p = 0.001) the technology positively influences the reliability and accuracy in the services offered. In line with H5, the findings showed that there is a strong positive correlation between responsiveness and e-business (B = 0.505, t = 8.963, p = 0.001) indicating that technological solutions increase organizational potential to address the needs of customers on

time. Lastly, H6 was well supported empirically, and it found that there existed a great relationship between e-business and user satisfaction (B = 0.666, t = 14.810, p = 0.001). This fact highlights the importance of the higher digital platforms and services in increasing the user experience and satisfaction. Overall, these findings validate the significance of adopting a combination of BI and e-business systems to increase the level of service quality, availability, reliability, responsiveness, and user satisfaction in the context of online services.

Table 6. Mediation result

Mediation	B	T-Values	P-Values	Result
Business Intelligence Systems (BIS) -> E-business -> Quality of Services	0.414	7.641	0.000	Partially mediate
Business Intelligence Systems -> E-business -> Reliability	0.321	5.770	0.000	Partially mediate
Business Intelligence Systems -> E-business -> Responsiveness	0.316	5.723	0.000	Partially mediate
Business Intelligence Systems -> E-business -> User Satisfaction	0.416	7.609	0.000	Partially mediate
Business Intelligence Systems -> E-business -> Availability	0.342	6.560	0.000	Partially mediate

Table 6 provides the categorical evidence of the high indirect role of e-business in the connection between BIS and different dimensions of e-service quality. In all five relationships under consideration, e-business mediated the BIS effect, and all the results were significant at p nbsp.001. To begin with, BIS showed a significant indirect contribution to Service Quality through e-business (B = 0.414, t =7.641), meaning that, although BIS independently makes services quality, it does it in an enhanced context of a strong e-business environment. Similarly, the indirect impact on Reliability (B = 0.321, t = 5.770) indicates that BIS enables the provision of more reliable and consistent services by means of operations enhancement that e-business tools allow. Regarding Responsiveness, the mediation effect (B = 0.316, t = 5.723) shows that when firms implement BIS, the timeliness in responding to the needs is greater when e-business processes of the firm are established. Likewise, in User Satisfaction (B = 0.416, t = 7.609), the results provide support that there is indeed a significant increment in the satisfaction when BIS is supported by sound e-business processes. Lastly, the indirect impact on the Service Availability (B = 0.342, t = 6.560) illustrates that BIS provides the Service Availability and uptime by offering an enabling role in e-business. All these findings confirm that e-business capabilities must be in place to help maximize the potential of BIS; although the BIS has a significant independent impact, it is best achieved through such an effective digital infrastructure that facilitates the intelligence of data with real-time service provision [26, 27].

The results of this paper offer strong empirical evidence of the critical role of BIS in promoting the e-business capability and, eventually, various aspects of the e-service quality [28-30].

5. DISCUSSION

The paper was meant to fill in some of the critical gaps in the introduction: the lack of an integrated framework between BIS and particular dimensions of e-service quality, insufficient empirical support of e-business capability as a mediating variable and paucity of studies in developing digital economies that use sophisticated structural modelling. These gaps are directly filled by the results of this research and bring new evidence of the instrumental effect of digital intelligence infrastructure on the service performance in new market realities.

The results first support the fact that BIS lead to significant improvement of e-business capability. This is observed empirically to support RBV, which assumes that to create value, the informational resources should be converted into organizational capabilities. In line with previous studies [7, 15, 31, 32] the data show that BIS enhances digital integration, automated processes, and coordination of operations in real-time, the elements that are critical to the successful online delivery of the services [33, 34]. However, the research is an extension of previous research since it shows that BIS in itself do not have a direct positive impact on service quality, but still, the impact becomes significant when organizations have a strong e-business capability. This observation highlights how analytical systems and operational digital infrastructure are complementary to each other, which has not been recognized in practice and theoretically addressed in the depth required [35, 36].

Secondly, the high positive correlations between e-business capability and all the four dimensions of e-service quality including the availability, reliability, responsiveness, and user satisfaction give a clear empirical evidence to the mediating role, which is previously under-explored. The findings are consistent with the study regarding the significance of digital infrastructure and integration processes in the determination of the performance of online services [37-39]. To provide an example, the notable impact of e-business on availability and reliability is reminiscent [40], who observed that developed digital architectures improve the uptime of the system and minimize service failure. This research builds upon these findings by showing that the responsiveness and user satisfaction are also driven by the e-business capability, which supports the perspective of customer-centric service design being multi-dimensional and central to online service environments [41-44].

These findings also narrow down on previous studies that analyzed BIS or e-business capability in isolation. Though previous literature has tended to record the direct correlations between BI tools and customer satisfaction or service quality, the literature has produced mixed results. There are works that dwell on the strong BIS-service impacts [45], and there are those that posit that the BIS effects depend on the preparedness of the organization, the capacity of users, or the integration of the system [46, 47]. This paper resolves these contradictions by showing empirically that BIS influence service quality indirectly, via the working processes of E-Business capability. Therefore, the results are a more consistent explanation of the inconsistent findings in earlier studies, due to the impossibility of achieving the full effects of BIS in the absence of supplementary digital ability [48].

This argument is also supported by the mediation analysis. The argument that the e-business capability is partially the mediator of all relationships between the dimensions BIS and service quality provides strong support of the IS Capability Theory. This theory assumes that BIS and other technological resources need to be transformed into higher level capabilities

so as to affect performance results. The current study constitutes one of the rare empirical confirmations of such logic to the context of the e-service quality, and to state that organizations are required to establish unified digital infrastructures to be able to make use of analytics. Thus, the study will address the identified theoretical gap in the introduction section by showing the offline connection of informational resources (BIS) and operational capabilities (e-business) as the determiners of digital service performance [49, 50].

Contextually, the findings clarify the digital transformation process in Jordan a developing digital economy in which the adoption of analytics is distributed differently in organizations. The high predictive ability of e-business capability implies that despite the existence of moderate technological maturity, the performance of the services in cases where organizations combine analytics with digital operations can be greatly enhanced. This adds to the contextual gap that is established in the introduction and agrees with the demands to conduct more empirical studies in Middle Eastern and emerging markets [51, 52].

Theoretically, the research will add to the literature because it proposes a model that is multifaceted, as the author combines BIS, e-business capability and four dimensions of e-service quality a combination that has not been explored sufficiently in previous literature. Through the approach of testing this model with the help of PLS-SEM, the research offers a strong empirical evidence that explains the way in which data-driven infrastructures can influence the outcome of services [53-56].

In practice, the findings have significant implications on managers and policymakers. BIS investments cannot be not accompanied by good e-business capacity such as process integration, automation, and real-time digital coordination, which organizations should not anticipate to make any difference in improving customer experience. Managers ought to focus on developing digital infrastructures that transform analytical findings to operational gains. To policymakers, the findings indicate that national policy efforts aimed at transforming digital communities should not only aim at promoting the adoption of BI but also consolidate the organizational structures that facilitate efficient provision of digital services [57-59].

Overall, the study develops the knowledge of BIS meditating on the quality of digital services by using e-business capability as a mediator. By connecting the findings to the specified research gaps, the literature on this topic in general, and theoretical framework, the study is able to provide a more concrete and consistent account of the way analytical resources become service value in the digital context, and specifically in emerging economies.

6. CONCLUSION

This research provides strong-based evidence on the high level of influence of BIS on e-business capabilities and service quality and proves that BIS brings in a positive impact on service availability, quality, reliability, responsiveness and customer satisfaction. The effect of partial mediation also implies that a strong digital infrastructure can help organizations to maximize the benefits of BIS by integrating it into it. These findings are supported by current literature, and it is important to note that there is a need to have digital transformation strategies that will combine advanced analytics and technology to enable the organizations to be flexible, efficient in their services, and satisfied by the customers.

Future studies ought to take a number of directions. First, longitudinal research is justified to identify the changes of the relationship between the quality of BIS-services and time especially in the cases of technological disruptions or market changes. Second, it might be relevant to increase the quantity of models including new technologies, i.e., artificial intelligence, blockchain, or digital twins, and discover a more comprehensive picture of their combined impact on services performance. Third, cross-industry or geographical research would shed more light on the role of contextual variables in mediating the effectiveness of BIS and e-business integration. Lastly, qualitative methods such as case studies and interviews would supplement the results with real life deployment experiences and success factors of BIS-led e-business solutions.

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