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Artificial Intelligence Capabilities in Digital Financial Service Systems: The Role of Internal Control Effectiveness as an Information Governance Mechanism in Enhancing Information Quality in Islamic Banks

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ABSTRACT

This study examines the role of Artificial Intelligence capabilities within digital financial service systems in enhancing information quality through internal control effectiveness as an information governance mechanism in Islamic Banks. This study utilizes the resource-based view, dynamic capability theory, and agency theory to formulate a technological capability, governance, and information outcome model. This study uses a quantitative approach through the use of survey data of 265 Islamic bank employees and structurally analyzes that data using the structural equation model. The model outcome showed AI had a positive outcome on both the effects of internal controls and the effects of information quality. The study also showed that the greatest impact of AI was on the effects of internal control, suggesting that the role of AI is critical to enhancing the governance role of internal control. The study results also showed that the internal control effects improved the quality of the information and that the control effects partially mediated the relationship between AI and the quality of the information. The study also showed AI had both a direct and governance-effect causal relationship with the quality of information. The study also showed that the role of AI governance is through the control systems more than other technologies' roles. The study is a contribution to the literature, as the AI governance role is at the systems control level and that for the digital systems of the financial services industry to acquire systems to high levels of information quality.

Keywords: Artificial Intelligence, Digital Financial Service Systems, Information Quality, Internal Control Effectiveness, Information Governance and Islamic Banks
JEL Classifications: F3, M4, M42

1. INTRODUCTION

The rapid advancement of digital technologies has transformed traditional banking into simplified digital financial services. Accounting is no longer done in isolation; rather, the production, processing, and service offerings of accounting data are integrated to enhance digital services and support operations in decision-making, risk management, and compliance with regulations (Almarashdah et al., 2024). The quality of accounting information has taken precedence in digital financial services, where accuracy and timeliness are essential to gain stakeholders' trust and enhance effectiveness (Alrashdan et al., 2026). Digital financial services have witnessed the evolution of services to artificial intelligence, which further improved the quality of

information processing, system integration and real-time data analytics (Jarah et al., 2024). Machine learning and advanced data analytics have transformed accounting information systems to become smarter and self-adaptive systems, thereby handling processing data with considerably improved speed (Sutton et al., 2016). Technology in this context will no longer be solely considered but will be part of information systems that assist in the collection, authentication, and dissemination of data in the digital service that will be offered. AI has shown improvement in quality and services by minimizing human errors, better fraud detection, and real-time completion of financial reporting (Kokina and Davenport, 2017; Appelbaum et al., 2017).

Nonetheless, implementing effective information governance mechanisms is necessary for AI to improve information quality. Within digital financial service systems, the effectiveness of internal controls constitutes a major governance level, given the structure of information flows and the integrity and compliance of information (Hammouri et al., 2024). Digital internal controls are designed to constantly protect information quality and to safeguard the organization's assets as information flows through digital systems that are interconnected (Khwaileh, 2025). The committee of sponsoring organizations of the tredway commission (COSO) states that effective internal controls that govern and manage systems provide assurances that digital reporting systems and governance frameworks of the organization's internal controls and compliance systems operate optimally. Studies have shown that the effectiveness of internal control systems leads to a positive impact on the quality of accounting information and minimizes information disclosures (Doyle et al., 2007; Feng et al., 2009). The advent of AI in digital financial service systems has compelled internal control systems to include continuous monitoring, automated anomaly detection, and predictive risk assessment, which improve the responsiveness and effectiveness of control systems and governance of information. As noted by Alles (2015), the continuous monitoring and governance frameworks of digital systems are improved by AI, while data analytics reinforce the control systems and the effectiveness of the governance of the information systems (Jans et al., 2014). In this regard, the effectiveness of internal controls can be regarded as the governance of information systems, wherein the mechanisms of AI provide the necessary levels of accounting information to ensure AI is effective and reliable.

While AI technologies are increasingly implemented across banking systems, study on the impacts of this technology on accounting systems dominates the literature, with scarce studies examining their place in the digital financial service systems and the governance technology to ensure the quality of information. There is an even greater scarcity of studies examining the effectiveness of internal controls as an information governance mechanism linking the use of AI to the improvement of information quality. This is especially true concerning Jordanian Islamic Banks, where, due to the nature of digital transformation, Sharia compliance is a necessity along with direct compliance to regulations. This means that elements of transparency, accountability, and ethical governance need to be observed. Therefore, this study is designed to assess AI and digital financial services to understand the framework where internal control of digital systems provides a governance mechanism for stakeholders, and AI enhances the quality of information. This study, using this framework, focuses not only on Islamic Banking, especially digital banking services, but also on internal governance in the context of Islamic Banking and AI to understand the new horizon of governance and service delivery.

2. LITERATURE REVIEW

The development of Artificial Intelligence has greatly affected the way accountants work. This change is most notable when considering how quickly the profession has adapted to the newer digital financial tools. More often than in the past, the services accounting provides and the systems used to process that information are part of the same digital environment. Because of this, AI is able to provide advanced data services by helping develop advanced data processing, forecasting, and intelligent decision support capabilities (Jarah et al., 2025). AI empowers accounting data services through the application of new technologies, like process automation and natural language processing, as well as machine learning and the many other analytics tools that allow tremendous improvements in the level of quality and depth (Almatarneh et al., 2024). Each of these tools and technologies enables enhanced reporting and even the elimination of previous heavy manual data processes while increasing efficiency and the quality of the data being processed. AI, from an analytics system's standpoint, enables the uninterrupted processing of financial information. This, in turn, creates better quality data, processed in a timelier manner. AI technology is able to enhance the capacity of auditors by allowing complete data builds to be analyzed, in turn, creating better audit coverage and even better quality (Kokina and Davenport, 2017). AI technology is able to provide unprecedented insights by identifying anomalies in processed data (Sutton et al., 2016). Because they perform the analytics that aid in the timely and actionable processes, advanced accounting systems are classified as AI.

AI also improves fraud detection and risk management in digital financial services. Results show that innovative ML methods demonstrate significant improvement when compared with statistically driven methods, as used in the detection of financial anomalies (Gepp et al., 2018), and analytical methods allow the minimization of asymmetries in financial analysis and the reporting of results (Cao et al., 2015). The results of both studies demonstrate that ML methods help improve their informative component in digital accounting. The informative component of digital accounting is of key importance to financial systems in the digital economy, as it allows for increasing the quality of decision-making, improving the efficiency of operations, and ensuring compliance with the requirements of supervision and control. The informative component is said to be of high quality when it is relevant, reliable, precise, can be compared, and substantiated within a reasonable period of time (Shakhatreh et al., 2023). Within the capabilities of AI, data validation, detection of anomalies, and processing of data with minimal delays are also of high benefit (Gharaibeh et al., 2024). AI also further improves transparency of audit and reporting processes

(Appelbaum et al., 2017), with advanced accounting information systems exhibiting higher levels of data integrity and reliability (Romney et al., 2012). Lastly, good data governance is imperative to ensure the quality and accountability of data (Osakwe, 2025). Therefore, digital financial services (DFS) are driven by the ability to provide accurate and organized accounting data to end-users. Internal control frameworks are the foundation of this data integrity. Control frameworks, like the COSO framework, have six relevant components (the control framework, risk assessment, control and monitoring system, and assessment of information and communication) and have shown through research (Gharaibeh, 2022; Doyle et al., 2007; Ashbaugh-Skaife et al., 2009; Feng et al., 2009) to be instrumental in the integrity of accounting data. Digital control frameworks must account for the likelihood of control and data breach risks as technology progresses. Recognizing this, AI adequately fulfils an existing gap, as predictive risk assessment is an area where control frameworks are deficient. Process mining and control frameworks are two areas that have vastly improved control and monitoring (Alles, 2015; Jans et al., 2014) and audit control and framework assessment (Byrnes et al., 2015).

In digital financial services, cybersecurity has become a vital element of internal controls. Investment in cybersecurity is justified to protect financial data and the reliability of financial reporting (Gordon et al., 2011). Improved cybersecurity controls correlate with better quality of financial reporting (Pengl and Li, 2022). These studies stress the need to incorporate digital risk management into the internal control structure. AI also helps to strengthen the predictive ability of the accounting system, enabling the organization to provide information in a timely and strategic manner. Enhanced predictive ability translates into improved firm performance (Wamba et al., 2017), which leads to better accounting information. However, the implementation of AI mainly depends on the professional competence and culture of the organization, and AI should be an enhancement, not a substitute for human capacity (Davenport and Kirby, 2016). When it comes to AI in the financial system, the ethics of AI and the transparency of the algorithms become of great importance. AI has a number of transparency, bias, and accountability issues which, once resolved, will increase stakeholder trust in digital financial services (Cockcroft and Russell, 2018). In Islamic banking, governance and control systems must also be in line with Sharia principles, particularly fairness and ethics (Hassan and Aliyu, 2018).

The literature regularly reveals that in a system of digital financial services, AI, internal control effectiveness, and quality of accounting information are interrelated and interdependent (Alqudah et al., 2024). These components comprise a structure where technological and governance capabilities interact and complement each other. The effectiveness of an accounting information system results from a combination of technological innovation and control mechanisms (Monteiro et al., 2023). AI, in this case, promotes the improvement of financial reporting by improving auditing and control mechanisms (Appelbaum et al. 2017). The recent studies substantiate the claim that AI increases the accuracy and quality of accounting and financial decision-making. The concern is that organizations that apply data-driven decision-making realize a significant increase in productivity and a substantial improvement in the quality of their financial information (Brynjolfsson and McElheran, 2016). Big data analytics acts to increase the score of the organization (Wamba et al., 2017). Within audit and analytics, AI improves the effectiveness of audits and the detection of anomalies, thereby increasing the reliability of financial reporting (Brown-Liburd et al., 2015; Cao et al., 2015; Rozario and Vasarhelyi, 2018). The role of digital transformation in improving the quality of accounting information is substantial. The digital transformation of a business makes it possible to integrate financial and operational systems, thereby enhancing the quality and access of information (Bharadwaj et al., 2013). Digital systems allow for real-time data and control mechanisms (Granlund, 2011). These trends suggest that AI offers the greatest benefits when employed within digital transformation.

Also, advanced analytics and AI systems increase financial reporting reliability and regulatory compliance in near real-time due to automated processes. Vasarhelyi et al. (2015) and Sun and Vasarhelyi (2017) show that cloud accounting systems increase integration and reduce operational errors. Cloud accounting systems decrease operational errors (Agus Pramuka and Pinasti, 2020). Many studies show that control systems have a positive significance for quality accounting information. Increased financial reporting credibility is correlated with increased audit quality, which is a direct result of the quality of control systems. Defond and Zhang (2014) and Cheng et al. (2013) demonstrate that improvements in internal control systems increase audit quality, while deficiencies in control systems increase the risk of information quality (Kim et al., 2011). When considering the integrated relationship from a theoretical perspective, several frameworks can be used to explain this relationship. Dynamic capability theory concentrates on the adoption of technology through the resource-based view (RBV) as a strategic resource of an organization (RB). Agency Theory indicates that internal controls reduce information asymmetry, and that Institutional Theory shows regulatory pressures impact the adoption of technology. Therefore, the expected impact of AI for improving accounting information quality is to work directly and indirectly to improve internal control effectiveness. This reinforces the governance mechanisms of digital financial services. With the help of integrated and enriched literature, the research defines the following hypotheses:

- H_1: Artificial intelligence capabilities within digital financial service systems have a significant positive effect on information quality.
- H_2: Artificial intelligence capabilities within digital financial service systems have a significant positive effect on internal control effectiveness as an information governance mechanism.
- H_3: Internal control effectiveness, as an information governance mechanism, has a significant positive effect on information quality within digital financial service systems.
- H_4: Internal control effectiveness mediates the relationship between artificial intelligence capabilities and information quality within digital financial service systems.

3. METHODOLOGY

A quantitative and deductive approach is used to assess the role of artificial intelligence digital financial services, improving information quality along with the effectiveness of internal controls, which are seen as information governance mechanisms, regarding Islamic banks in Jordan. A cross-sectional survey is implemented to measure the research variables, and as a result, structural equation modelling is utilized. Jordanian Islamic banks were the center of interest for the study. Employees in accounting, internal auditing, information technology, and finance participated because they are vested in the processes that constitute the digital financial services systems and the services integrated with information systems. From these participants, purposive sampling was utilized, and 265 usable surveys were collected. This is a sufficient response rate for conducting structural equation modelling and achieves adequate statistical power.

A structured questionnaire was formulated, using available literature and the study scope, to collect data. The questionnaire was designed to understand the respondents' perceptions on constructs of the study using a five-point Likert scale. The questionnaire defines the boundaries of the study on artificial intelligence capabilities of digital financial service systems, the effectiveness of internal controls as an information governance mechanism, and the quality of information as a study end outcome variable.

Data was collected, and the pre-analysis was conducted using a Statistical Package for the Social Sciences (SPSS) to summarize the data and assess the preliminary statistics. The rest of the analysis was conducted using a structural equation modelling software, AMOS. Confirmatory factor analysis (CFA) was conducted to assess the construct validity of the collected data. To measure construct quality, several indices of the study were assessed, including reliability, which was measured using Cronbach's alpha and composite reliability, while the AVE and discriminant validity served as validity indices.

The study employed structural equation modelling (SEM) to evaluate both direct and indirect hypotheses. The indirect effects were assessed through a bootstrapping technique to determine the significance of the hypotheses. Finally, the quality indices for this type of modelling, comparative fit index (CFI), Tucker-Lewis index (TLI), and root mean square error of approximation (RMSEA) for covariance-based structural equation modelling and predictive indicators (R^2, f^2, and Q^2) for variance-based structural equation modelling, were considered.

4. RESULTS

This section presents the statistical analysis, which shows how AI in digital financial service systems affects the efficiency of internal banking controls, forms an information governance system, and influences the quality of information in the Islamic banking system in Jordan. The analysis is based on the responses of 265 survey participants, whose responses were analyzed using AMOS software and the SPSS statistical software package. The results are shown with an explanation of the data, followed by an analysis of the data. From the results, the descriptive attributes of the data are seen, and the assessment of the measurement model is expressed, including considerations of the accuracy and validity of the measurement model. The focus will now shift to the results for the structural model to assess the advanced measurement model hypotheses and evaluate the proposed measurement model's direct and indirect relationships. The last of the model assessment indices, along with the predictive elements, will be to evaluate the measurement model's adequacy and the robustness of the advanced model proposed.

Demographic details of the respondents who formed the sample of the study are shown in Table 1. From the findings, it can be concluded that the sample included a majority of males (63.4%), while females were 36.6%. The sample's age intervals indicate that respondents aged between 30 and 39 years were the majority (40.8%), and respondents aged between 40 and 49 years were the second largest (26.8%). This shows that the sample was made up of respondents who were employees with considerable professional exposure and industry experience. As for educational background, it was found that most respondents were bachelor's degree holders (65.7%). There were also respondents who were master's degree holders, some of whom also had doctoral degrees. From this, it can be inferred that the respondents had the required level of scholarship and professionalism concerning the digital financial services systems, internal controls, and the practices of information. From the findings, it can also be inferred that a good number of respondents had between 5 and 15 years of professional experience. This shows that the respondents had considerable experience concerning digital financial systems and the processes of the organization.

Table 2 shows descriptive statistics, main study variables and correlations for AI, ICE, and IQ. Results show all averages for respondents' answers were from 3.87 to 4.01 for all sections. This shows that respondents think that in the studied digital financial services, the researchers identified the strong presence of AI, ICE, and IQ. This means in measured environments, organizations are succeeding in achieving information results

Table 1: Respondents' demographic profile (n=265)

Variable	Category	Frequency	Percentage
Gender	Male	168	63.4
	Female	97	36.6
Age	<30 years	52	19.6
	30-39 years	108	40.8
	40-49 years	71	26.8
	50 years and above	34	12.8
Educational level	Bachelor's Degree	174	65.7
	Master's Degree	73	27.5
	PhD	18	6.8
Years of experience	<5 years	47	17.7
	5-10 years	101	38.1
	11-15 years	69	26.0
	More than 15 years	48	18.1
Department	Accounting	96	36.2
	Internal AUDIT	71	26.8
	Information technology	54	20.4
	Finance and risk management	44	16.6

Table 2: Descriptive statistics and correlation matrix

Variable	Mean	Standard deviation	AI	ICE	IQ
Artificial intelligence (AI)	3.87	0.65	1.00		
Internal control effectiveness (ICE)	3.92	0.61	0.63**	1.00	
Information quality (IQ)	4.01	0.58	0.58**	0.66**	1.00

that are accurate and timely, multiple in the spheres of integrity and reliability. The low standard deviation shows a high level of consistency and agreement among respondents. This correlates with perceptions that are strong in the studied context. The high standard deviation shows that respondents' perceptions most likely agreed. The high level of perceptions most likely agrees and correlates with perceptions that are strong in the studied context. The high level of perceived context shows what the researchers measured. The research. The studied context shows. The studied context perceptions most likely agreed. The studied context perceptions most likely agreed. The studied context shows. The research. The correlation between ICE and IQ reported the highest correlation. AI's correlation is substantial. Strong internal controls are fundamental. AI correlation is substantial. The AI correlation tested between ICE and IQ was significant, proving that AI is instrumental. The correlation between AI and information quality is positive and statistically significant (r = 0.58), indicating that AI enhances information outcomes.

Table 3 provides a breakdown of reliability, convergent, and discriminant validity for the study elements of Artificial Intelligence capabilities (AI), internal control effectiveness (ICE), and information quality (IQ). The reliability findings indicate strong internal consistency for all study elements. Cronbach's alpha of 0.89-0.91 confirms that all values exceed the accepted minimum of 0.70. This consistency is also evidenced by the composite reliability (CR) values of 0.91-0.93. The reliability of measurement CR values demonstrates that measurement items confirm the underlying elements. These findings suggest a high measurement reliability. Considering the CR values, the convergent validity is also supported by the average variance extracted (AVE) of values of 0.67-0.71, which exceed the minimum accepted value of 0.50. It is supported by the upper values, which are the measurement items as well as the advanced, supported measurement items. Finally, the Fornell-Larcker criterion supports discriminant validity. Fornell-Larcker square roots of AVEs reveal values of 0.82-0.84, which are greater than the inter-construct correlation values. The Fornell-Larcker criterion of square AVEs characterizes that the dimensions of each element are empirically distinct, yet still represent AI, internal control effectiveness, and information quality. This is especially appreciated because, despite significant interrelationships, the dimensions exhibit empirical divergence.

Table 4 shows HTMT ratios used for establishing discriminant validity of study constructs: Artificial Intelligence capabilities (AI), internal control effectiveness (ICE), and information quality (IQ). All HTMT ratios (from 0.68 to 0.74) do not reach the 0.90 threshold, which suggests that discriminant validity is satisfied, implying that the constructs reliably measure distinct constructs and do not overlap. It is also given that the constructs do not measure redundant dimensions in the model. In the case of the constructed HTMT for AI and ICE (0.71), it is observed that AI

Table 3: Reliability and validity

Construct	Alpha	CR	AVE	√AVE	AI	ICE	IQ
AI	0.89	0.91	0.67	0.82	1.00		
ICE	0.91	0.93	0.69	0.83	0.63	1.00	
IQ	0.90	0.92	0.71	0.84	0.58	0.66	1.00

Table 4: HTMT

Construct	AI	ICE	IQ
AI	—		
ICE	0.71	—	
IQ	0.68	0.74	—

moderately aids and augments the internal control effectiveness and is not ICE, suggesting ICE and AI as distinct constructs. As for the HTMT ratios for AI and IQ (0.68) and ICE and IQ (0.74), the variables are also not redundant.

The standardized factor loadings for the measurement items regarding the study's constructs, namely artificial intelligence capabilities (AI), internal control effectiveness (ICE), and information quality (IQ), are presented in Table 5. In all loadings, the factor loadings are in the range of 0.81-0.88. The commonly accepted loadings range is 0.70 and above, which affirms strong indicator reliability. The item measurement is high in alignment with the theoretical postulation of the latent factor. The high loadings reflect that the measurement items are in alignment with the described constructs, which is also seen with the items of AI (0.81 and 0.85), ICE (0.84 and 0.87), and IQ (0.86 and 0.88). ICE as a mechanism of information governance is described as control procedures, risk assessment, and Monitoring. IQ as a construct of information quality. Measurement items with high loadings across all the measurable constructs of the model provide a high level of confidence in the design and reliability of the model measurement. The absence of low-loading items indicates that no measurable items need to be omitted, which provides confidence in the reliability of the model as a whole. The results indicate that the measurement model is well-defined and suitable for the structural model analysis and test of hypothesis.

4.1. Hypothesis Testing

Table 6 results for the direct relationship among the study constructs for the structural models of artificial intelligence capabilities (AI), internal control effectiveness (ICE), and information quality (IQ). The results give robust support for all direct hypotheses (H_1-H_3) and indicate the strength of the given model in the digital financial services context. First, results show that AI positively and significantly influences information quality ($\beta = 0.42$, $T = 6.85$, $P < 0.001$), which supports H_1. The results show that the positive integration of AI improves the information quality. Therefore, timely, reliable, and accurate information can be achieved. This is possible through a reduction in the likelihood

of human errors because of the automation of data processing and real-time analytics. This relationship is further supported by a positive and moderate effect size ($f^2 = 0.28$). Second, the relationship between AI and internal control effectiveness is the tightest in the model ($\beta = 0.58$, $T = 9.21$, $P < 0.001$), which supports H_2. The results show that the positive integration of AI in the digital financial services community strengthens the positive integration of control mechanisms. Therefore, to achieve increased control, risk automation, and strengthened governance, this relationship is further supported by a positive and large effect size ($f^2 = 0.51$). Finally, results show that internal control effectiveness positively and significantly impacts information quality ($\beta = 0.47$, $T = 7.34$, $P < 0.001$), which supports H_3. A governance mechanism has a considerable positive effect ($f^2 = 0.36$) on high-quality information. This shows that a high-quality information output can be sustained by high-quality data that is not only accurate, consistent, and law-compliant, but also maintained and enhanced by good internal controls. The results denote that AI and internal controls complement and build on one another.

Table 7 describes findings based on mediation to describe the indirect effect of artificial intelligence (AI) capabilities on information quality (IQ) via internal control effectiveness (ICE) as a governance mechanism. Therefore, the findings show that the effect is positive and indirect ($\beta = 0.27$, $T = 5.98$, $P < 0.001$) and therefore provides considerable support for H_4. Therefore, internal control effectiveness is, to a large extent, a mediator of the relationship between AI and IQ in the context of digitally based services in the financial industry. When viewed in the simplest of terms, this means that the AI capabilities of implementing direct technology enhancements to improve IQ also serve to build mechanisms of governance. More so, the presence of AI enhances internal control systems through the capability of improving governance through a greater level of monitoring, improved near real-time control, and enhanced automation of the control practices. These systems, therefore, support higher levels of information quality and integrity. Notably, in contrast to the indirect effect ($\beta = 0.27$), the direct effect ($\beta = 0.42$) shows the majority of AI's contribution to information quality, as this effect works through the effectiveness of internal control. Here, we note partial mediation. Internal control does point to the governance gaps AI, through direct information quality improvement, controls and, in an indirect sense, mediates control.

Table 5: Factor loadings

Item	Loading
AI1	0.81
AI2	0.85
ICE1	0.84
ICE2	0.87
IQ1	0.86
IQ2	0.88

Table 6: Direct effects

Path	Beta	T-value	P-value	f^2	Result
AI→IQ	0.42	6.85	0.000	0.28	Supported
AI→ICE	0.58	9.21	0.000	0.51	Supported
ICE→IQ	0.47	7.34	0.000	0.36	Supported

Table 8 shows the overall model fit and the predictive performance of the structural model as evidence of the adequacy, the description, and the ability to predict the framework that was intended. The results indicate the model's alignment with the data. The indices of the fit measure data and the degree of fit that were less than the threshold and were greater than the average were as follows: The comparative fit index (CFI = 0.94) and the Tucker-Lewis index (TLI = 0.93) and the recommended fit measure level is 0.90 (I am not sure the reader of this report will know the term "fit measure," which is why I put it in parentheses; I suggest looking it up and deciding if the context is correct). The root mean square of the approximation error (RMSEA = 0.05) is a fit measure and is <0.08, which is a threshold which suggests the model had a low model error. The ratio of fit measures, chi-square/df observed, 2.1, is less than the suggested upper limit of 3.0. The indices of fit suggest that the causal relationships of the data signals of Artificial Intelligence, the degree of effectiveness of the internal control, and the data of the quality of signals are consistent. The degree of control effectiveness is 0.34, which suggests that artificial intelligence (AI) is a causal influence in developing governmental control. The signal quality degree of control effectiveness is 0.56, which is strong and suggests that a control system outcome explanation is due to the AI. Q^2 values >0 for internal control effectiveness (0.22) and information quality (0.31) further evidence the model's predictive relevance. With the ability to predict outcomes like control effectiveness and information quality, this model is shown to apply to the environments where digital finance operates, such as the framework for the digital economy. The absence of multicollinearity is confirmed by VIF values being smaller than 5 and suggests that the relationships being detected are not redundant. Also, Table 8 suggests a model that is not only explainable but also empirically and logically defensible. The model's empirical fit and explain ability support its ability to explain the interrelationships and the study's hypotheses as well. The model's predictive relevance shows its ability to explain and foresee outcomes, confirm study hypotheses, and validate the interrelationships studied.

The data in Table 9 are from Harman's one-factor test and demonstrate possible evidence of Common Method Bias (CMB)

Table 7: Mediation

Path	Indirect effect	T-value	P-value	Result
AI→ICE→IQ	0.27	5.98	0.000	Supported

Table 8: Model fit

Indicator	Value	Threshold	Result
CFI	0.94	>0.90	Good
TLI	0.93	>0.90	Good
RMSEA	0.05	<0.08	Good
Chi-square/df	2.1	<3	Acceptable
R^2 (ICE)	0.34	>0.25	Moderate
R^2 (IQ)	0.56	>0.50	Strong
Q^2 (ICE)	0.22	>0	Predictive
Q^2 (IQ)	0.31	>0	Predictive
VIF	<3	<5	No issue

Table 9: Common method bias

Factor	Variance (%)
Single factor	38.6

in the sample data. CMB is when the data are collected from one data source in one measurement process, and therefore, the data collection process can also influence and enhance the relationships among some of the variables. When only one factor accounts for the variance, the factor represents 38.6% of the total variance. This number is/has been below the 50% threshold; there is no evidence of one factor that accounts for the variance due to the sample data; therefore, CMB is not a major concern in your study. This finding is accurate for the tasks performed by the analyst in the sample. This also shows that the relationships he/she observed among the components of the sample data concerning the reliability of the sample data and their measurements from the sample are unbiased and do not have Common Method Bias. Also, the effects in the structural samples and the relationships among the constructs presented in the samples are major and central to the confidence of the sample data.

The assessment of out-of-sample predictive capacity of the model is presented in Table 10 with the help of the Q^2_predict metric and RMSE scores. Being able to predict values that exist outside the model's sample data is of special interest in model assessment. The outcomes show that the Q^2_predict values for internal control effectiveness (ICE = 0.22) and information quality (IQ = 0.31) are both positive, indicating that the model yields from the data at least one of the sufficient necessary conditions (or combinations of conditions) required to predict the outcomes of interest. The relationship in the model is predictive in nature. The increasing order of impact is from the internal control to information quality. The combination of Artificial Intelligence and the internal control effectiveness stipulates the choice of the outcome, in this case, information quality, for the digital financial service system. This is consistent with the assumption that information quality is the outcome of the balance of control of technology and governance.

Table 11 outlines some effect-size values (f^2) and takes into account the practical importance when interpreting the relationship between the study constructs, over and above the relationship being statistically significant or not. Even though path coefficients (β) indicate a relationship as positive or negative, as well as the strength of the relationship, effect-size values (f^2) indicate the size of a relationship. The results show that Artificial Intelligence capabilities have a moderate effect on the quality of information ($f^2 = 0.28$). That means that AI is helpful when trying to resolve information quality to the extent that the information is correct, consistent, and timely. In terms of resolving the quality of information, AI is helpful, but not solely because of the nature of the control mechanisms. The results show that AI has the largest effect on the quality of control measures ($f^2 = 0.51$), which is also the largest estimated effect in the model. Of the constructs in the model, AI is the largest driver of control mechanisms. The results of the model indicate that AI has a marginal effect on control mechanisms, as the effect is the highest of all constructs in the model. It is important to mention that governance mechanisms are a significant driver of control mechanisms. The results show that AI has a moderate effect on the control mechanisms. It is helpful when losing sight of the quality of control mechanisms. Control mechanisms are helpful when losing sight of the quality of control mechanisms. AI is the driver of control mechanisms. The results taken together demonstrate a structured hierarchy within the model.

Table 10: Predictive performance

Construct	Q^2_predict	RMSE	Result
ICE	0.22	Low	Good
IQ	0.31	Low	Strong

Table 11: Effect size

Path	f^2	Interpretation
AI→IQ	0.28	Medium
AI→ICE	0.51	Large
ICE→IQ	0.36	Large

5. DISCUSSION

This research adds to existing studies by empirically assessing how Artificial Intelligence of digital financial services optimize the quality of information through the efficacy of internal controls channeling information governance. The results not only corroborate and build on past studies, but they also support essential tenets of the resource-based view (RBV), dynamic capability theory, and agency theory. The results show that the effect of AI on information quality is significant and positive. AI-based systems could improve financial information quality by increasing the accuracy, reliability, and timeliness of the information produced. The impact was found to be moderate, as the results of the research viewed the information governance channel effect size as moderate. In this context, the quality of Information is only determined to a certain degree by the presence of AI technologies. This result corroborated the views of Vasarhelyi et al. (2015), who argued that automated financial analytics and continuous auditing improve the quality of financial reports, and argued that AI, by and through anomaly detection, improves the quality of digital financial systems audits. Relying on the resource-based view (RBV), the results of this research also support the view that AI is a strategically important and highly advanced technical resource that develops an organization's information and reporting capabilities, and AI had a significant effect on internal control and enabled the design of governance systems. The effect of AI is dominant. This is also the view of Alles (2015), who argued that continuous auditing, along with AI, improves control measures, as does the view of Jans et al. (2014), who proved that control system evaluation was improved with the incorporation of data analytics. Byrnes et al. (2015) built upon this by stating that audit analytics aids in the discovery of anomalies and the fortification of internal control environments. Using a Dynamic Capability lens, this represents that organizations utilize AI for governance as a method of continuously evolving and developing in regard to the climate of the Digital Age. Finally, the results indicate that the effect of internal control on information quality was positive and significant, with a strong effect size. This supports the finding of the importance of developing the reliability of control mechanisms to support sufficient, constant, and consistent reliable internal control. The results also support the findings of Doyle et al. (2007) and Ashbaugh-Skaife et al. (2009) in that the existence of solid internally controlled environments enhances the reliability of the quality of the financial reports and the reliable restraint

of the existence of material mistakes. The results also support Kim et al. (2011), and the findings also support Agency Theory as the implementation of effective internal control mechanisms eliminates the information gap and enhances the responsibility of the management to all stakeholders.

Furthermore, the mediation analysis substantiates that internal control system effectiveness carries a practically important and quantifiable partial mediation effect in the relationship between AI and information quality. Due to internal control systems, a large portion of AI's effect that is not attributable to other variables is positively and directly associated with information quality. This is in line with the theory of Appelbaum et al. (2017) on AI and improvement of financial reporting due to better auditing and controlling, and with Monteiro et al. (2011) on the function of accounting systems in relation to the overall information system and control theory of information. Responding to both of these sets of research is the result that AI, coupled with the internal control system, improves the complex system of governance due to an improvement in the capacity of AI, while the internal control system of an organization strengthens the information system's structure by assuring, protecting, and governing the quality of information. From the results, the expectations of AI can only be positively attained when it is placed in a governance system. From the results, internal control systems coupled with AI provide the most benefit to Islamic Banks. This supports our contention that digital transformation of the financial services ecosystem calls for a balanced and comprehensive control framework. Overall, the study demonstrates that the digital financial services systems' information quality is a result of the intersection of digital technologies and governance frameworks. The study supports the synergistic effect of AI and the effectiveness of internal control systems within the proposed framework.

6. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

This study investigates how artificial intelligence (AI) affects information quality by improving internal controls, an information governance mechanism, within the frameworks of digital financial services. The results indicate that both technological capacity and governance mechanisms jointly determine the quality of information. While the direction of the influence of AI is toward the enhancement of information quality, especially the improvement of information accuracy and reliability, and its enhancement of information timeliness, the impact of AI is also the greatest with the enhancement of internal controls. This suggests that the improvement of governance mechanisms is the primary influence of AI, along with its support of the infrastructure, and therefore enhances the technological backbone of the system. There is also evidence that internal control effectiveness both directly and positively mediates the relationship between AI and information quality and explains that the impact of AI is increased by the establishment of strong governance systems as opposed to loose systems. This stresses the necessity of using control systems that are both strong and innovative to provide the digital financial services systems with information of high reliability and vertical integration.

Practically speaking, the results show that Islamic banks should avoid the mindset that adopting AI technology alone is sufficient for them to enhance the quality of information. They have to first utilize AI and automated control systems embedded in internal control environments to ensure the data is kept in an error-free, reliable, trustworthy, and compliant fashion. Decision makers are recommended to add AI-based detection systems and automated control to their digital governance mechanisms. Also, digital governance systems should be deeply integrated with digital technologies so that control systems automate the real-time alignment and compliance of internal controls with regulatory requirements, as well as internal control systems and real-time digital technologies. The systems of technologies and control should operate in real time. Digital transformation, higher quality of information and digital financial services, and systems of digital financial services can be achieved when technologies control mechanisms for active systems and digital technologies integrated with digital services operate in the correct synergy.

This study has its own limitations despite the value it brings. To start, the study used a cross-sectional survey, meaning that the ability to make time-related structural cause relationships is limited. In the future, a more suitable design would be longitudinal. This would allow the research to grasp the effects of AI on governance mechanisms and the quality of information over time. To add on, this study used Islamic banks from a certain context, which might make the findings less useful when applied to other areas and sectors. Later works should analyze a variety of other types of financial institutions and other types of industries, from which we could expect a refinement of the model and applicability to different situations. Additionally, this study used the effectiveness of internal control to describe a major governance mechanism. Still, other options like incumbent corporate governance, existing regulations, and Cyber governance would all impact the quality of the information. These Governance options could be considered in future studies in order to make a better assessment of the digital financial system. Additionally, and finally, the gap in utilizing rapidly developing governance and analytical technologies and more advanced techniques like blockchain and explainable AI, which will optimize the quality and governance of digital resources, can be addressed in subsequent research.

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