

Edge-Enabled Centralized Contract Intelligence for Shariah-Compliant Islamic Banking: Determinants of Effective Contract Management and the Mediating Role of System-Level Centralization in Malaysia

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Abstract

The rapid digital transformation of financial institutions has intensified the need for intelligent, secure, and resilient contract governance systems, particularly within Shariah-compliant Islamic banking where contractual integrity underpins financial legitimacy. Despite the central role of contracts in Islamic finance, limited empirical research integrates system-level intelligence and centralized governance structures to enhance contract management effectiveness. This study proposes an Edge-Enabled Centralized Contract Intelligence (ECCI) framework to examine the determinants of effective contract management in Malaysia's Islamic banking sector. Drawing upon governance theory and contract management literature, the study investigates the effects of employee competency, stakeholder engagement, contract monitoring, and accountability on effective contract management, with system-level centralization as a mediating construct. A quantitative approach was employed using structured questionnaires distributed to 298 Islamic banking employees involved in the contract lifecycle. Data were analyzed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings reveal that employee competency, stakeholder engagement, contract monitoring, and accountability significantly influence effective contract management. System-level centralization demonstrates the strongest direct effect and significantly mediates the relationships between organizational factors and governance outcomes. The study concludes that integrating edge-enabled centralized intelligence architectures enhances transparency, operational efficiency, and Shariah compliance. By strengthening institutional governance, the framework contributes to Sustainable Development Goals (SDGs) 8 (Decent Work and Economic Growth), 9 (Industry, Innovation and Infrastructure), and 16 (Peace, Justice and Strong Institutions). The findings provide strategic guidance for Islamic banks seeking resilient, technology-driven contract governance ecosystems.

Keywords: Edge intelligence; Centralized governance; Contract management; Islamic banking; Shariah compliance; System-level intelligence; Sustainable Development Goals.

1.0 INTRODUCTION

Contracts constitute the foundational architecture of Islamic banking operations, governing financing arrangements, partnership structures, leasing instruments, and investment vehicles. Classical contract theory emphasizes the binding nature of agreements and the protection of reliance interests in contractual relationships (Fuller & Perdue, 1936; Atiyah, 1979; Smith, 2004). Within Islamic banking, however, contracts extend beyond commercial exchange to embody Shariah principles of fairness (*adl*), transparency, and accountability (*amanah*). As the Islamic banking industry in Malaysia continues to mature and expand (Balarabe et al., 2023), the complexity and volume of contractual engagements have intensified. Financing contracts such as *Ijarah*, partnership-based instruments, and asset-backed transactions significantly influence bank performance and profitability (Stapah et al., 2021; Yusuf & Isa, 2021). Consequently, ineffective contract management may not only undermine operational efficiency but also compromise Shariah compliance and stakeholder trust. Despite the centrality of contracts in Islamic finance, empirical research on the determinants of effective contract management within Islamic banking institutions remains limited. Existing studies primarily focus on financial performance, efficiency, and governance characteristics (Alandejani, 2022; Guizani & Ajmi, 2021; Khamar Tazilah et al., 2021), while contract governance processes at the organizational level receive comparatively less scholarly attention. Contract governance has been shown to significantly influence performance outcomes in public-private partnerships (Latif et al., 2023), suggesting that structured oversight mechanisms are essential in complex financial ecosystems. However, limited research investigates how internal organizational factors such as employee competency, stakeholder engagement, contract monitoring, and accountability collectively shape contract management effectiveness in Islamic banking institutions. Employee competency represents a critical determinant of organizational performance. Empirical evidence suggests that employee competency and organizational culture significantly affect workplace outcomes and stress management (Kim & Jung, 2022). Within Islamic banking, competency encompasses not only legal and technical expertise but also Shariah literacy and ethical awareness. The effectiveness of Islamic recruitment and selection processes in ensuring person-job fit further underscores the importance of aligning employee capability with institutional objectives (Omar et al., 2021). However, the relationship between employee competency and effective contract governance in Islamic financial institutions has not been comprehensively examined. In the absence of sufficient expertise, contract misinterpretation, compliance breaches, and operational inefficiencies may arise.

Leadership support and organizational culture further shape governance practices. Leadership commitment has been identified as a significant driver of effective contract management (Azizi Ahmad Sarkawi et al., 2023). Moreover, Islamic work ethic, organizational culture, and leadership practices have been found to mediate performance outcomes in Islamic institutional contexts (Dianingrum et al., 2024; Huma Siddiqui et al., 2021). Ethical practices are particularly critical in public financial management and contract administration (Anana, 2021). Nevertheless, there remains a paucity of empirical investigation into how accountability mechanisms and stakeholder engagement influence contract lifecycle performance within Islamic banking institutions. Given that Islamic banking emphasizes value-based intermediation and the realization of *Maqasid al-Shariah* (Mahyudin & Rosman, 2020), weak accountability structures may expose institutions to reputational risks, consumer dissatisfaction, and regulatory scrutiny. Consumer protection concerns further highlight deficiencies in contract governance. Studies have documented issues related to unfair contract terms in Malaysian Islamic banks and emphasized the need for ethical frameworks and financial literacy to empower stakeholders (Mahinar Abu Bakar et al., 2020; Bakar et al., 2024). Such findings suggest that contract transparency and governance mechanisms remain areas requiring institutional strengthening. Furthermore, Islamic banking performance measurement literature identifies governance integration as a continuing challenge (Rosmanidar et al., 2021). The absence of integrated contract

governance systems may undermine corporate governance effectiveness, which is crucial for financial sustainability (Solomon et al., 2003). An additional unresolved issue concerns the structural organization of contract management functions specifically, whether centralization enhances effectiveness. The debate between centralization and decentralization has long occupied management scholarship (Rust, 1919; Huda, 2022). In financial supervision, centralized oversight has demonstrated implications for banking stability and efficiency (Avignone et al., 2021). Similarly, centralized procurement systems have shown potential for improving accountability and efficiency in public sector enterprises (Islam, 2014). Conversely, decentralization may enhance flexibility but risk inconsistencies in governance quality (Fory et al., 2021). Within Islamic banking institutions, contract-related responsibilities are often dispersed across Shariah, legal, compliance, procurement, and audit units. Fragmentation may result in information silos, inconsistent monitoring, and weakened accountability.

While studies on contractor effectiveness (Brian & MIPFO, 2018) and contract performance characteristics (Rashid Issa, 2019) highlight the importance of structured oversight, limited empirical research examines centralization as a mediating governance mechanism in Islamic banking contract management. The question remains whether a centralized contract management framework can amplify the positive effects of employee competency, stakeholder engagement, monitoring, and accountability on overall effectiveness. Addressing this question is particularly significant in the context of Malaysia's Islamic banking sector, where regulatory sophistication and institutional maturity demand integrated governance architectures. In sum, there exists a critical research gap at the intersection of human factors, governance structures, and contract lifecycle effectiveness within Islamic banking institutions. Although prior studies have explored leadership support, ethical practices, governance characteristics, and financial performance, a comprehensive empirical model integrating employee competency, stakeholder engagement, contract monitoring, accountability, and centralized governance remains underdeveloped. Without such understanding, Islamic banking institutions risk inefficiencies, compliance breaches, and diminished stakeholder trust. Therefore, this study seeks to address these gaps by empirically examining the determinants of effective contract management and investigating the mediating role of centralized contract management within Malaysia's Islamic banking industry. By doing so, it contributes to strengthening governance resilience, operational efficiency, and Shariah-compliant financial practices in an increasingly complex banking environment.

2.0 LITERATURE REVIEW

Extant literature underscores the critical importance of effective contract management in enhancing organizational performance, governance quality, and institutional accountability. Contract management has evolved from a purely administrative function to a strategic governance mechanism that influences financial performance and risk mitigation (Rashid Issa, 2019). Within financial institutions, particularly Islamic banks, contract governance is closely linked to compliance integrity, operational transparency, and value-based intermediation (Mahyudin & Rosman, 2020). However, empirical investigations examining the multidimensional determinants of contract management effectiveness remain limited, particularly in Islamic banking contexts.

2.1 Employee Competency and Effective Contract Management:

Employee competency has consistently been identified as a core determinant of organizational performance. Competency encompasses knowledge, technical skills, experience, and ethical awareness necessary for executing job responsibilities effectively. Kim and Jung (2022) demonstrated that employee competency significantly influences workplace outcomes and stress management, suggesting that competent personnel contribute to improved operational processes and organizational stability. In contract governance contexts, such competencies extend to legal interpretation, regulatory compliance, and risk assessment capabilities. Within Islamic institutions, competency must also include Shariah literacy and ethical sensitivity. Omar et al. (2021) highlighted the importance of Islamic recruitment and selection practices in achieving person-job fit, emphasizing that alignment between employee capability and organizational expectations enhances performance outcomes. Leadership support further strengthens competency utilization; Azizi Ahmad Sarkawi et al. (2023) found that leadership commitment significantly improves contract management effectiveness by facilitating training, guidance, and policy alignment. These findings collectively suggest that employee competency plays a vital role in ensuring effective contract lifecycle management, particularly in environments requiring dual regulatory and Shariah compliance.

2.2 Stakeholder Engagement and Contract Performance

Stakeholder engagement is central to effective governance systems, particularly where contracts involve multiple functional units. Islamic banking contracts typically require collaboration among Shariah boards, legal departments, compliance units, procurement teams, and auditors. Latif et al. (2023) found that contract governance significantly strengthens partnership performance in public-private partnerships, indicating that collaborative structures enhance monitoring, transparency, and shared accountability. The broader governance literature reinforces the importance of stakeholder coordination. Solomon et al. (2003) emphasized that effective corporate governance depends on structured interaction among directors and institutional actors. In Islamic organizational contexts, Dianingrum et al. (2024) reported that Islamic organizational culture and leadership mediate employee performance outcomes, demonstrating that shared values and participatory engagement mechanisms positively influence institutional effectiveness. Similarly, Huma Siddiqui et al. (2021) established that Islamic work ethics moderate the relationship between job satisfaction and employee performance, underscoring the role of ethical stakeholder engagement in enhancing outcomes. These studies imply that stakeholder engagement in contract management is not merely procedural but also cultural and ethical, thereby contributing to improved performance and compliance.

2.3 Contract Monitoring and Accountability

Monitoring mechanisms are fundamental to ensuring contract compliance and minimizing opportunistic behavior. Rashid Issa (2019) empirically confirmed that structured contract management practices improve organizational performance characteristics, including cost control and risk mitigation. In public financial management settings, Anana (2021) demonstrated that ethical practices and systematic oversight significantly enhance contract management outcomes, reinforcing the importance of monitoring frameworks. Accountability, closely related to monitoring, is a central principle in governance theory. Classical contract theory emphasizes the protection of reliance interests and enforcement of obligations (Fuller & Perdue, 1936; Smith, 2004). In Islamic banking, accountability assumes an additional moral dimension grounded in Shariah principles. Studies on unfair contract terms in Malaysian Islamic banks highlight the necessity of transparent oversight and ethical compliance to safeguard consumer rights (Mahinar Abu Bakar et al., 2020; Bakar et al., 2024). Weak monitoring systems may expose institutions to reputational risks and diminish stakeholder trust. Therefore, empirical evidence suggests that robust monitoring and accountability mechanisms are essential determinants of effective contract management.

2.4 Centralization in Governance Structures

The structural organization of contract management functions has long been debated within management scholarship. Rust (1919) first articulated the trade-offs between centralization and decentralization, emphasizing efficiency and control considerations. More recent studies continue this debate. Huda (2022) noted that centralization enhances policy consistency and oversight, whereas decentralization increases flexibility. In the financial sector, Avignone et al. (2021) provided evidence that centralized banking supervision influences stability and regulatory coherence, suggesting that integrated oversight structures can enhance institutional resilience. In procurement and public sector enterprises, centralized systems have demonstrated improved accountability and cost efficiency (Islam, 2014). Conversely, Fory et al. (2021)

cautioned that excessive centralization may constrain human resource performance if not balanced with autonomy. Within Islamic banking, corporate governance characteristics have been shown to influence financial performance (Khamar Tazilah et al., 2021), indicating that structural governance arrangements matter for institutional outcomes. However, empirical research specifically examining centralized contract management as a mediating governance mechanism in Islamic banking remains scarce.

2.5 Contract Management and Islamic Banking Performance

Islamic banking performance literature predominantly focuses on profitability, efficiency, and investment performance. Stapah et al. (2021) and Yusuf and Isa (2021) demonstrated that financing contracts significantly affect bank profitability, reinforcing the centrality of contractual arrangements in financial outcomes. Guizani and Ajmi (2021) further showed that Islamic banking practices influence corporate investment efficiency, highlighting the strategic implications of contract structures. Alandejani (2022) compared efficiency and profitability between Islamic and conventional banks, underscoring governance integration as a performance determinant. Rosmanidar et al. (2021) observed that Islamic banking performance measurement remains conceptually fragmented, calling for more integrated governance models. Despite this body of research, limited attention has been directed toward internal contract lifecycle governance processes. Existing studies emphasize macro-level performance metrics but rarely investigate micro-level determinants such as employee competency, stakeholder engagement, monitoring, and accountability in shaping contract management effectiveness. Furthermore, the mediating role of centralized governance structures remains underexplored. In summary, previous studies collectively suggest that employee competency, stakeholder engagement, contract monitoring, and accountability significantly influence governance outcomes and organizational performance. Centralization has demonstrated potential benefits in enhancing oversight and institutional coherence. However, an integrated empirical framework examining these variables within the context of Islamic banking contract management is lacking. Addressing this gap is essential to advance theoretical understanding and strengthen governance resilience in Malaysia's Islamic banking sector.

3.0 RESEARCH METHODOLOGY

This study adopts a quantitative research approach to examine the factors influencing effective contract management among employees in Malaysia's Islamic banking industry, as well as the mediating role of centralized contract management. Quantitative methods were selected because they enable objective measurement of constructs, hypothesis testing, and the examination of complex relationships among variables through statistical modelling (Bryman, 2016; Field, 2018). Given the predictive and exploratory nature of the proposed framework, Partial Least Squares Structural Equation Modelling (PLS-SEM) was employed. PLS-SEM is particularly suitable for assessing mediation effects, handling complex models with multiple constructs, and analysing relationships in organizational and governance research (Hair et al., 2019). This method allows for simultaneous evaluation of the measurement and structural models, thereby providing robust insights into the determinants of effective contract management within Islamic banking institutions.

3.1 Survey Instrument

The research utilized a structured questionnaire comprising six constructs derived from established literature on contract governance, organizational behavior, and Islamic institutional management: Employee Competency, Stakeholder Engagement, Contract Monitoring, Accountability, Centralized Contract Management, and Effective Contract Management. Each construct was operationalized using multiple items measured on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." Measurement items were adapted from validated sources in contract governance, leadership support, ethical practices, and organizational performance studies (Azizi Ahmad Sarkawi et al., 2023; Rashid Issa, 2019; Latif et al., 2023; Anana, 2021). Employee Competency measured respondents' knowledge, technical skills, Shariah literacy, and ability to manage contract lifecycle processes effectively. Stakeholder Engagement assessed the degree of cross-functional collaboration among Shariah, legal, compliance, audit, procurement, and vendor management units. Contract Monitoring captured the presence of systematic review mechanisms, performance tracking, and compliance audits. Accountability evaluated transparency, role clarity, documentation practices, and enforcement mechanisms (Kharuddin et al., 2020). Centralized Contract Management measured the extent to which contract governance functions were integrated under a unified structure supported by standardized procedures and digital systems. Finally, Effective Contract Management assessed overall performance outcomes, including compliance assurance, risk mitigation, operational efficiency, and adherence to Shariah principles.

3.2 Data Collection

Data were collected over a four-week period through electronic distribution of questionnaires via official institutional communication channels and professional networks within Islamic banking institutions in Malaysia. The target respondents comprised employees directly or indirectly involved in the contract lifecycle, including personnel from Shariah, legal, compliance, audit, procurement, vendor management, and contract management departments. Out of 450 distributed questionnaires, 298 valid responses were retained after screening for completeness and consistency, yielding a response rate of 66.2%. Participation was voluntary, informed consent was obtained, and confidentiality was assured. Ethical approval was secured in accordance with institutional research guidelines.

3.3 Sampling

Stratified random sampling was employed to ensure proportional representation across functional departments within Islamic banking institutions. This approach enhances representativeness and improves generalizability of findings across diverse governance roles (Etikan & Bala, 2017). The sample size exceeded the minimum requirements recommended for PLS-SEM analysis, which suggest a minimum of ten times the maximum number of structural paths directed at a particular construct (Hair et al., 2019). This ensures sufficient statistical power to detect mediation effects and evaluate structural relationships (Li et al., 2025).

3.4 Statistical Analysis

Data analysis was conducted in two stages using SPSS and SmartPLS. First, SPSS was used for preliminary analysis, including descriptive statistics, data screening, and reliability testing. Assumptions such as normality, multicollinearity, and outlier detection were examined. Variance Inflation Factor (VIF) values were below the recommended threshold of 5, indicating no significant multicollinearity concerns (Hair et al., 2019). Second, SmartPLS was used to assess the measurement and structural models. Reliability and validity were evaluated using Cronbach's alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). Consistent with recommended benchmarks, Cronbach's alpha and CR values exceeded 0.70, and AVE values were above 0.50, confirming internal consistency and convergent validity (Fornell & Larcker, 1981). Discriminant validity was established using the Fornell-Larcker criterion, which confirmed that each construct shared greater variance with its indicators than with other constructs in the model. Bootstrapping procedures with 5,000 resamples were applied to test the significance of path coefficients and mediation effects. The structural model demonstrated statistically significant relationships between Employee Competency, Stakeholder Engagement, Contract Monitoring, Accountability, and Effective Contract Management ($p < 0.05$). Centralized Contract Management also showed a significant positive effect on Effective Contract Management. Furthermore, mediation analysis revealed that centralization significantly mediated the relationships between the four predictor variables and effective contract management, indicating that a unified governance structure strengthens the impact of organizational and human factors on performance outcomes.

The model exhibited satisfactory explanatory power, with R^2 values indicating moderate to substantial variance explained in Effective Contract Management. Effect size (f^2) and predictive relevance (Q^2) assessments further confirmed the model's robustness. Overall, the integrated framework demonstrated strong predictive capability in explaining contract governance effectiveness within Islamic banking institutions. By combining rigorous psychometric validation with advanced structural modelling techniques, this study provides empirical evidence on the determinants of effective contract management and the strategic role of centralized governance structures. The findings offer practical implications for Islamic banking institutions seeking to enhance Shariah-compliant contract governance, strengthen accountability, and

improve operational efficiency. Moreover, the study contributes to the growing body of governance and financial management literature by empirically validating a mediation model that integrates human capability, stakeholder coordination, monitoring systems, and structural centralization within a unified analytical framework.

4.0 RESULT AND FINDINGS

This study examined both the direct and mediating relationships among key determinants of effective contract management within Malaysia's Islamic banking industry. Drawing on responses from 298 employees involved in the contract lifecycle, the analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) with bootstrapping (5,000 resamples) to assess path significance and mediation effects. The principal constructs examined were Employee Competency (EC), Stakeholder Engagement (SE), Contract Monitoring (CM), Accountability (AC), Centralized Contract Management (CCM), and Effective Contract Management (ECM) as the ultimate outcome variable.

4.1 Direct Effects

The structural model revealed several statistically significant direct relationships, as summarized in Table 1.

Employee Competency significantly influenced Effective Contract Management ($\beta = 0.29, p < 0.001$), indicating that higher levels of technical expertise, Shariah literacy, and governance capability enhance contract lifecycle performance. This finding aligns with prior research emphasizing leadership support and competency as critical drivers of contract governance effectiveness (Azizi Ahmad Sarkawi et al., 2023; Kim & Jung, 2022). Stakeholder Engagement demonstrated a positive and significant relationship with Effective Contract Management ($\beta = 0.24, p < 0.001$). This suggests that cross-functional coordination among Shariah, legal, compliance, audit, and procurement units strengthens transparency and execution quality, consistent with governance studies highlighting collaborative structures as performance enhancers (Latif et al., 2023). Contract Monitoring was also a significant predictor ($\beta = 0.27, p < 0.001$), reinforcing evidence that systematic oversight and performance tracking mechanisms are central to contractual compliance and risk mitigation (Rashid Issa, 2019; Anana, 2021). Accountability showed a meaningful positive influence on Effective Contract Management ($\beta = 0.22, p < 0.01$), underscoring the importance of transparency, documentation, and enforcement systems in Shariah-compliant institutions (Mahinar Abu Bakar et al., 2020; Bakar et al., 2024). Centralized Contract Management exerted the strongest direct effect on Effective Contract Management ($\beta = 0.35, p < 0.001$), suggesting that structural integration and unified governance mechanisms significantly enhance performance. This finding is consistent with research demonstrating that centralization improves institutional coherence and regulatory oversight (Avignone et al., 2021; Islam, 2014).

Table 1: Direct Effects of Structural Model

Hypothesis	Path	Beta (β)	t-value	p-value	Result
H1	EC \rightarrow ECM	0.29	5.84	<0.001	Supported
H2	SE \rightarrow ECM	0.24	4.97	<0.001	Supported
H3	CM \rightarrow ECM	0.27	5.21	<0.001	Supported
H4	AC \rightarrow ECM	0.22	3.89	<0.01	Supported
H5	CCM \rightarrow ECM	0.35	6.73	<0.001	Supported

$$R^2 \text{ (ECM)} = 0.68$$

$$Q^2 \text{ (Predictive relevance)} = 0.41$$

The R^2 value indicates that 68% of the variance in Effective Contract Management is explained by the model, reflecting substantial explanatory power.

4.2 Mediating Effects of Centralized Contract Management

Bootstrapping analysis was conducted to examine the indirect effects of Employee Competency, Stakeholder Engagement, Contract Monitoring, and Accountability on Effective Contract Management through Centralized Contract Management. Results are presented in Table 2. Employee Competency demonstrated a significant indirect effect via Centralized Contract Management ($\beta = 0.11, p < 0.01$), indicating partial mediation. This suggests that competent employees contribute more effectively within structured, centralized governance systems. Stakeholder Engagement also exhibited a significant mediated effect ($\beta = 0.09, p < 0.05$), implying that collaborative interactions enhance centralized coordination, which subsequently improves governance outcomes. Contract Monitoring showed a significant indirect effect ($\beta = 0.10, p < 0.01$), suggesting that oversight mechanisms are more impactful when embedded within unified governance frameworks. Accountability demonstrated a significant indirect relationship ($\beta = 0.08, p < 0.05$), indicating that transparency and documentation practices are strengthened under centralized structures.

Table 2: Mediation Effects via Centralized Contract Management

Hypothesis	Indirect Path	Beta (β)	t-value	p-value	Mediation Type
H6a	EC \rightarrow CCM \rightarrow ECM	0.11	2.94	<0.01	Partial
H6b	SE \rightarrow CCM \rightarrow ECM	0.09	2.31	<0.05	Partial
H6c	CM \rightarrow CCM \rightarrow ECM	0.10	2.76	<0.01	Partial
H6d	AC \rightarrow CCM \rightarrow ECM	0.08	2.12	<0.05	Partial

The results demonstrate that effective contract management in Malaysia's Islamic banking institutions is shaped by a combination of human capability, collaborative engagement, structured oversight, ethical accountability, and governance centralization. Among the predictors, Centralized Contract Management emerged as the strongest structural driver, indicating that unified governance architectures significantly enhance contract lifecycle performance. The mediation findings further confirm that centralization strengthens and channels the influence of organizational and human factors. Rather than replacing decentralized functional expertise, centralization appears to integrate and amplify these capabilities, creating a more coherent and resilient governance framework. Overall, the integrated model provides strong empirical support for a governance-based approach to contract management, highlighting that performance effectiveness depends not only on individual competencies and monitoring systems but also on institutional structure and coordination mechanisms. These findings offer actionable insights for Islamic banking leaders seeking to enhance compliance integrity, operational efficiency, and Shariah-aligned governance performance.

5.0 DISCUSSION & CONCLUSION

This study advances the discourse on edge-enabled intelligence and governance innovation by empirically validating the determinants of effective contract management within Malaysia's Islamic banking sector. The findings demonstrate that employee competency, stakeholder engagement, contract monitoring, and accountability significantly enhance effective contract management, while system-level centralization plays both a direct and mediating role. These results highlight that contract governance in Islamic banking is not solely a procedural function but a strategic, intelligence-driven system embedded within institutional architecture. Employee competency emerged as a critical enabler of effective contract management. In Shariah-compliant financial environments, contractual arrangements must simultaneously satisfy regulatory, legal, and ethical standards. Competent employees equipped with Shariah literacy, risk assessment skills, and digital contract management capabilities strengthen institutional resilience and reduce non-compliance risk. This finding aligns with Sustainable Development Goal (SDG) 8: Decent Work and Economic Growth, as professional capacity building enhances productivity, governance quality, and sustainable financial

sector growth. By investing in human capital development, Islamic banks contribute to stable employment ecosystems and long-term economic sustainability. Stakeholder engagement and accountability further reinforce SDG 16: Peace, Justice and Strong Institutions. Islamic banking operates within a trust-based ethical framework where transparency, fairness, and governance integrity are paramount. The significant influence of engagement and accountability indicates that cross-functional coordination among Shariah boards, compliance units, legal teams, and procurement departments strengthens institutional justice and reduces governance fragmentation. Transparent contract governance supports responsible financial intermediation and safeguards stakeholder rights, contributing to institutional legitimacy and public confidence. Contract monitoring, particularly when supported by edge-enabled digital systems, enhances real-time oversight and risk detection. By embedding intelligence closer to operational units, edge architectures reduce latency in compliance verification and performance evaluation. This system-level responsiveness aligns with SDG 9: Industry, Innovation and Infrastructure, which emphasizes resilient infrastructure and sustainable industrial innovation. The integration of centralized digital contract intelligence represents an infrastructural transformation that strengthens operational efficiency while ensuring Shariah compliance. Notably, system-level centralization demonstrated the strongest direct and mediating effects, underscoring its role as a structural governance mechanism. Centralization consolidates dispersed contractual data, standardizes procedures, and enhances information symmetry across departments. When embedded within an edge-enabled architecture, centralized systems improve decision-making agility, data security, and audit traceability. This hybrid model combining centralized governance with distributed intelligence supports resilient financial ecosystems capable of adapting to regulatory complexity and technological disruption. The mediating role of centralization also suggests that organizational capabilities achieve maximum impact when aligned with coherent governance structures. Employee competency, engagement, monitoring, and accountability are amplified under unified contract intelligence systems, reinforcing the importance of system-level design in institutional reform. Such structural integration reflects a shift from fragmented administrative processes to intelligent governance ecosystems that are transparent, secure, and sustainability-oriented. Overall, the study contributes to the broader agenda of sustainable digital transformation in financial services. By linking contract governance innovation to SDGs 8, 9, and 16, the findings position edge-enabled centralized contract intelligence not merely as an operational enhancement but as a mechanism for advancing inclusive economic growth, institutional integrity, and resilient infrastructure. For policymakers and Islamic banking leaders, the results underscore the necessity of integrating technological intelligence with governance reform to achieve sustainable and socially responsible financial development.

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