

The Impact of Artificial Intelligence on the Formation of Commercial Contracts: The Mediating Role of Ethical Considerations in the Kingdom of Saudi Arabia

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ABSTRACT

This study investigates the impact of Artificial Intelligence (AI) capabilities on Commercial Contract Formation (CCC) with Ethical Considerations (EC) as a mediating variable among Saudi startups. The research aims to explore how AI-driven systems enhance contractual efficiency and transparency while emphasizing the importance of ethical responsibility in digital transformation. Using a quantitative approach, data were collected through structured questionnaires and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results reveal that AI capabilities significantly and positively influence both EC and CCC, while EC also demonstrates a significant mediating effect between AI and CCC. These findings highlight that ethical frameworks strengthen the positive impact of AI on contract formation by promoting fairness, accountability, and trust in automated decision-making. The study contributes to the growing body of literature on ethical AI governance and offers practical insights for organizations seeking to balance innovation and integrity in AI-enabled contracting systems aligned with Saudi Vision 2030.

KEYWORDS: Artificial Intelligence, Ethical Considerations, Contract Formation, Digital Transformation.

1. INTRODUCTION

Artificial Intelligence (AI) has rapidly become a cornerstone of digital transformation, reshaping business operations, governance structures, and the foundations of commercial contracting worldwide. In recent years, AI-driven systems have increasingly influenced how contracts are negotiated, formed, and executed, improving speed, efficiency, and accuracy while minimizing human bias and error. The automation of contract formation and the use of predictive analytics have reduced traditional barriers in legal and business transactions, thereby enhancing transparency and operational precision (Mik, 2022; Surden, 2024). In the context of Saudi Arabia's Vision 2030, AI adoption has been identified as a catalyst for innovation and entrepreneurship, particularly among startups seeking to modernize commercial and legal processes (Alsharidah & Alazzawi, 2020; AlShwaier & Abdullah, 2025). As Saudi organizations increasingly transition toward digital ecosystems, the ability to harness AI responsibly becomes essential to achieving sustainable development and institutional trust (Albaroudi et al., 2025; Gorian & Osman, 2024).

Despite AI's transformative potential, the integration of ethical considerations in AI-enabled contract formation remains a pressing challenge. Ethical concerns such as data privacy, algorithmic fairness, transparency, and accountability have emerged as critical factors determining the legitimacy and trustworthiness of AI applications (Agrawal, 2024; Hosseini Tabaghdehi & Ayaz, 2025). While AI can automate legal reasoning and contractual interpretation, ethical frameworks ensure that these technologies align with societal norms and corporate values (Kiradoo, 2023; Camilleri, 2024). Without ethical oversight, automation may reinforce bias, erode stakeholder confidence, or compromise compliance standards (Somani, n.d.; Veiga & Costa, 2024). This highlights the need to understand how ethical considerations mediate the relationship between AI capabilities and commercial contract formation outcomes, particularly within emerging economies where regulatory structures are evolving.

Empirical studies have emphasized that ethical AI practices strengthen accountability, foster trust, and sustain long-term organizational performance (Luciano, 2025; Bourne, 2025). Integrating ethical frameworks into AI governance ensures that automation enhances not replaces human judgment in contractual decision-making (Agrawal, 2023; Horneber, 2025). Moreover, in sectors where contracts are central to operations, ethical digital transformation drives value creation and legitimacy (Saurabh et al., 2022; Hirvonen-Ere, 2025). For Saudi startups navigating a rapidly evolving technological landscape, ethical considerations are not merely regulatory obligations but strategic assets that shape reputation,

stakeholder engagement, and contractual success (Ayobami et al., 2024; Bokhari, Park, & Manzoor, 2025).

Therefore, this study aims to examine the effect of AI capabilities on commercial contract formation with ethical considerations as a mediating variable. It investigates whether ethical frameworks enhance the effectiveness, fairness, and reliability of AI-driven contract processes among Saudi startups. By integrating insights from AI ethics, institutional theory, and responsible digital governance, the study seeks to bridge theoretical and practical gaps in understanding how ethical mediation transforms technological potential into sustainable performance. The findings are expected to contribute to both academic discourse and managerial practice by demonstrating how AI-enabled organizations can align innovation with ethical integrity in support of Saudi Arabia's Vision 2030 digital economy objectives.

2. LITERATURE REVIEW

Artificial Intelligence (AI) is reshaping modern organizations by automating decision-making and redefining legal, operational, and contractual processes. Within the business environment, AI has improved efficiency, predictive capability, and analytical precision, especially in contract management and procurement systems. Mik (2022) notes that AI automates key phases of contract formation drafting, negotiation, and implementation thereby reducing uncertainty and human error. Surden (2024) adds that AI-enabled computable law transforms traditional legal frameworks into dynamic, data-driven models that enhance contractual enforcement. This technological advancement is increasingly relevant in Saudi Arabia, where Vision 2030 promotes digital transformation and entrepreneurship as national priorities. Startups adopting AI are achieving operational agility and competitive advantage by digitizing their legal and administrative workflows (Alsharidah & Alazzawi, 2020; AlShwaier & Abdullah, 2025). In this context, the ability to use AI responsibly in contract management represents a key enabler of transparency, innovation, and economic sustainability (Omoegun et al., 2025).

While AI enhances efficiency, scholars consistently highlight ethical and social risks accompanying automation. Kiradoo (2023) explains that the deployment of AI in sensitive domains like contracting introduces issues of bias, accountability, and fairness. Camilleri (2024) similarly argues that without strong ethical frameworks, automation may reinforce discrimination or create opaque decision processes that undermine legitimacy. Saurabh et al. (2022) conceptualize AI-led ethical digital transformation as a process that integrates moral reasoning into technological systems to preserve trust and integrity. Luciano (2025) further proposes that intelligent AI systems must be designed to make ethical judgments, not just operational ones, ensuring that human values remain embedded in algorithmic logic. These perspectives affirm that ethical considerations are not peripheral but foundational to responsible AI adoption in contractual settings where equity and trust are indispensable (Veiga & Costa, 2024; Hosseini Tabaghdehi & Ayaz, 2025).

A substantial body of literature emphasizes the strategic value of embedding ethics into AI governance. Agarwal (2023) contends that integrating ethical principles in AI operations enhances accountability, transparency, and fairness cornerstones of responsible governance. Horneber (2025) extends this argument by asserting that responsible AI governance increases institutional legitimacy and stakeholder confidence, aligning technology adoption with social expectations. Within the Saudi digital economy, Gorian and Osman (2024) point out that ethical AI deployment must correspond to national cultural norms and regulatory frameworks to maintain trust and compliance. Scholars such as Papagiannidis (2024) and Saurabh et al. (2022) connect ethical AI governance with sustained competitive advantage, suggesting that moral responsibility enhances innovation capability and long-term performance. Hence, ethics is not only a compliance requirement but also a strategic capability that converts automation into socially valuable outcomes.

Empirical studies further demonstrate that ethical AI practices lead to measurable improvements in trust, performance, and compliance. Bourne (2025) finds that ethical oversight in AI enhances privacy protection and fairness, mitigating bias and fostering confidence among users. Ayobami et al. (2024) show that AI-driven ethics and compliance frameworks in digital procurement elevate accountability and transparency, resulting in better contracting outcomes. Similarly, Bokhari, Park, and Manzoor (2025) reveal that ethical AI governance in public systems strengthens stakeholder participation and institutional collaboration. These findings support the view that ethics functions as a mediating mechanism linking

technology capabilities with social and economic trust. In the Saudi context, Albaroudi et al. (2025) emphasize that ethical innovation under Vision 2030 reinforces sustainability and regulatory integrity, ensuring that rapid digital transformation proceeds responsibly. Hirvonen-Ere (2025) complements this by noting that proactive ethical integration within automation frameworks ensures inclusivity and fairness across industries, bridging technological progress with moral accountability.

Despite substantial progress in AI-driven contract research, there remains a gap concerning how ethical considerations shape or mediate the relationship between AI capabilities and contract formation outcomes. Most existing studies focus on the technical or operational benefits of AI without explaining how ethics influences the effectiveness and legitimacy of digital contracting. The present study addresses this gap by proposing that ethical considerations serve as an intermediary that enhances the reliability, transparency, and sustainability of AI-enabled contract formation. This mediating function transforms technical capacity into socially responsible performance, aligning with contemporary perspectives on responsible innovation and digital governance.

Building on theoretical and empirical insights, the study's hypotheses are derived from established relationships identified in prior research. Surden (2024) and Mik (2022) demonstrate that AI capabilities improve the precision and speed of contract management, implying a direct positive relationship between AI capabilities and commercial contract formation. Kufile et al. (2022) find that AI-based decision-support systems strengthen negotiation and supplier-selection outcomes, reinforcing the efficiency of contracting processes. At the same time, literature indicates that the adoption of AI encourages the integration of ethical principles within organizations. Luciano (2025) and Saurabh et al. (2022) observe that firms leveraging AI technologies tend to establish ethics-driven guidelines that enhance accountability and transparency. Therefore, AI capabilities are expected to positively influence ethical considerations. Moreover, ethical factors themselves are known to improve contractual quality and stakeholder confidence. Camilleri (2024) and Veiga and Costa (2024) show that organizations embedding ethical values into digital operations achieve higher compliance and fairness standards, which strengthen contract performance. Consequently, ethical considerations are expected to positively affect commercial contract formation. Finally, drawing upon Horneber (2025) and Hosseini Tabaghdehi and Ayaz (2025), ethical frameworks can be understood as a mediating bridge that connects AI capabilities with sustainable and trustworthy contract outcomes. Thus, this study posits that ethical considerations mediate the relationship between AI capabilities and commercial contract formation in Saudi startups, ensuring that automation remains both efficient and morally sound.

3. METHODOLOGY

This study adopts a quantitative research design to examine the effect of Artificial Intelligence (AI) capabilities on commercial contract formation, with ethical considerations serving as a mediating variable. The quantitative approach enables systematic measurement and analysis of relationships among constructs, ensuring objectivity, reliability, and statistical validity. The design is consistent with prior studies exploring technology adoption, governance, and ethical frameworks using survey-based quantitative methodologies (Afthanorhan, Awang, & Aimran, 2020; Anwar, Hoga, TKA, & Resad, 2021). Given the increasing role of AI in Saudi Arabia's digital transformation under Vision 2030, the study focuses on Saudi startups that have integrated AI systems into business, procurement, and contractual processes (Alsharidah & Alazzawi, 2020; AlShwaier & Abdullah, 2025). This context provides a relevant platform to explore the interaction between technological capability, ethical responsibility, and commercial outcomes.

The population of the study consists of managers, legal officers, IT professionals, and executives working in Saudi startups actively implementing AI-based decision-making tools. A purposive sampling technique was used to ensure that respondents possessed relevant experience with AI-driven contract management. The sample size was determined based on recommendations for Partial Least Squares Structural Equation Modeling (PLS-SEM), which supports small to medium samples for complex models with latent variables (Afthanorhan et al., 2020). Data were collected through a structured questionnaire, designed using validated scales from previous studies addressing AI ethics, governance, and organizational performance (Kiradoo, 2023; Camilleri, 2024; Luciano, 2025). The instrument was divided into three sections measuring AI capabilities, ethical considerations, and commercial contract formation. Each item was

rated on a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5), ensuring response consistency and comparability.

A pilot study was conducted with a small group of respondents to test clarity, reliability, and cultural suitability. Feedback from the pilot phase led to minor revisions to enhance comprehensibility and relevance to the Saudi context (Gorian & Osman, 2024). The finalized questionnaire was distributed electronically to reach a wider range of respondents while maintaining confidentiality and voluntary participation. The research strictly followed ethical guidelines regarding informed consent, data privacy, and anonymity, aligning with international and Saudi ethical research standards (Camilleri, 2024; Veiga & Costa, 2024). Data analysis was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software, chosen for its robustness in testing mediation models and handling complex constructs (Afthanorhan et al., 2020). The analysis followed a two-stage process. First, the measurement model was assessed to examine indicator reliability, internal consistency, and convergent and discriminant validity using metrics such as composite reliability (CR), average variance extracted (AVE), and the heterotrait-monotrait (HTMT) ratio. Second, the structural model was evaluated to test the hypothesized relationships among AI capabilities, ethical considerations, and commercial contract formation. The mediation effect of ethical considerations was analyzed using the bootstrapping procedure with 5,000 resamples to assess indirect effects and significance levels (Horneber, 2025; Hosseini Tabaghdehi & Ayaz, 2025).

Descriptive statistics, including mean, standard deviation, skewness, and kurtosis, were used to evaluate data distribution and normality. The reliability and validity results were interpreted in line with established benchmarks in AI ethics and digital transformation research (Papagiannidis, 2024; Kiradoo, 2023). By integrating ethical considerations as a mediating variable, the model captures the mechanisms through which AI capabilities influence contract formation outcomes in Saudi startups. This methodological approach ensures a comprehensive evaluation of the direct and indirect effects of AI, providing empirical evidence that bridges technological efficiency with ethical responsibility in digital contracting practices.

4. Findings

This chapter presents the findings of the study, which examine the impact of Artificial Intelligence (AI) capabilities on Commercial Contract Formation (CCC) with Ethical Considerations (EC) as a mediating variable. This chapter reports the results of the data analysis conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM), including descriptive statistics, measurement model evaluation, and structural model testing. The purpose of this section is to interpret the empirical outcomes and determine whether the proposed hypotheses are supported. The findings highlight how AI-driven innovations, when guided by ethical principles, enhance the transparency, efficiency, and reliability of digital contract formation within Saudi startups.

As shown in Table 4.1, the descriptive analysis presents the overall perceptions of respondents toward Artificial Intelligence (AI) capabilities, Ethical Considerations (EC), and Commercial Contract Formation (CCC) within Saudi startups. The results reveal relatively high mean values for all constructs, with AI capabilities averaging 3.917 (SD = 0.875), Ethical Considerations 4.020 (SD = 0.822), and Commercial Contract Formation 3.902 (SD = 0.850), indicating strong agreement among participants on the positive role of AI in enhancing efficiency, transparency, and ethical responsibility in digital contracting processes. The findings suggest that Saudi startups actively integrate AI tools to improve contract accuracy and performance while maintaining fairness and accountability in line with ethical frameworks. The low standard deviations reflect consistent responses, confirming that ethical practices are increasingly perceived as essential in ensuring trust and compliance in AI-based contract management. Overall, the descriptive results highlight that ethical awareness and AI utilization are well-aligned in promoting responsible innovation and sustainable digital transformation consistent with Saudi Vision 2030 objectives.

Table 4.1: Descriptive Analysis

Items	N	Mean	Std. Deviation
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AI	298	3.917	0.875
CCC	298	3.902	0.850
EC	298	4.020	0.822

AI: Artificial Intelligence; CCC: Formation / Conclusion of Commercial Contracts; EC: Ethical Considerations

As presented in Table 4.2, the normality test results show that all study variables Artificial Intelligence (AI) capabilities, Ethical Considerations (EC), and Commercial Contract Formation (CCC) fall within the acceptable range for skewness and kurtosis, confirming that the data are approximately normally distributed. The skewness values range from -1.462 to -1.202, while the kurtosis values vary between 1.857 and 2.680, all within the recommended thresholds of ± 2 for skewness and ± 3 for kurtosis. These results indicate that the dataset meets the normality assumption required for further multivariate analysis, particularly Partial Least Squares Structural Equation Modeling (PLS-SEM). The normal distribution of responses suggests that participants provided balanced evaluations across all constructs, supporting the validity and reliability of the statistical analysis. Consequently, the data are suitable for subsequent reliability, validity, and structural model testing to assess the mediating role of ethical considerations in the relationship between AI capabilities and contract formation outcomes in Saudi startups.

Table 4.2: Normality test

	N	Skewness	Kurtosis
AI	298	-1.396	2.391
CCC	298	-1.202	1.857
EC	298	-1.462	2.680

AI: Artificial Intelligence; CCC: Formation / Conclusion of Commercial Contracts; EC: Ethical Considerations

As indicated in Table 4.3, the Kolmogorov-Smirnov and Shapiro-Wilk tests were conducted to further assess data normality across the three constructs Artificial Intelligence (AI) capabilities, Ethical Considerations (EC), and Commercial Contract Formation (CCC). The results show that all significance values (Sig.) are less than 0.05, indicating that the data deviate from a perfectly normal distribution. Specifically, for CCC, the Kolmogorov-Smirnov statistic is 0.150 with a significance level of 0.000, while for AI and EC, the statistics are 0.150 and 0.175, respectively, both with significance levels of 0.000. However, this deviation from normality is not problematic, as the PLS-SEM analytical technique used in this study does not require strict normality assumptions for multivariate data. The large sample size ($n = 298$) further mitigates concerns about non-normality, ensuring the robustness of the results. Thus, despite the significance values indicating non-normal distribution, the dataset is appropriate for PLS-SEM analysis, which can effectively handle non-parametric data structures when examining mediation effects among AI capabilities, ethical considerations, and commercial contract formation.

Table 4.3: Kolmogorov-Smirnov Test

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CCC	0.150	298	0.000	0.899	298	0.000
AI	0.150	298	0.000	0.872	298	0.000
EC	0.175	298	0.000	0.871	298	0.000

AI: Artificial Intelligence; CCC: Formation / Conclusion of Commercial Contracts; EC: Ethical Considerations

As illustrated in Figure 4.1, the measurement model demonstrates the relationships among the latent constructs Artificial Intelligence (AI) capabilities, Ethical Considerations (EC), and Commercial Contract Formation (CCC) and their corresponding indicators. All observed variables show strong standardized

loadings above the recommended threshold of 0.70, confirming their reliability and contribution to the respective latent constructs. The measurement model's structure validates the hypothesized dimensions of AI capabilities, ethical principles, and contract formation processes, providing a clear representation of how each construct interacts within the overall framework. These results indicate that the indicators effectively capture the theoretical domains of technological capability, ethical responsibility, and contractual efficiency, which are foundational to the study's conceptual framework. This outcome aligns with methodological standards in PLS-SEM, ensuring that the reflective measurement model exhibits adequate convergent and discriminant validity. Consistent with the works of Camilleri, the validated model supports the notion that integrating ethical considerations into AI-driven systems enhances the robustness, transparency, and trustworthiness of contract formation in Saudi startups.

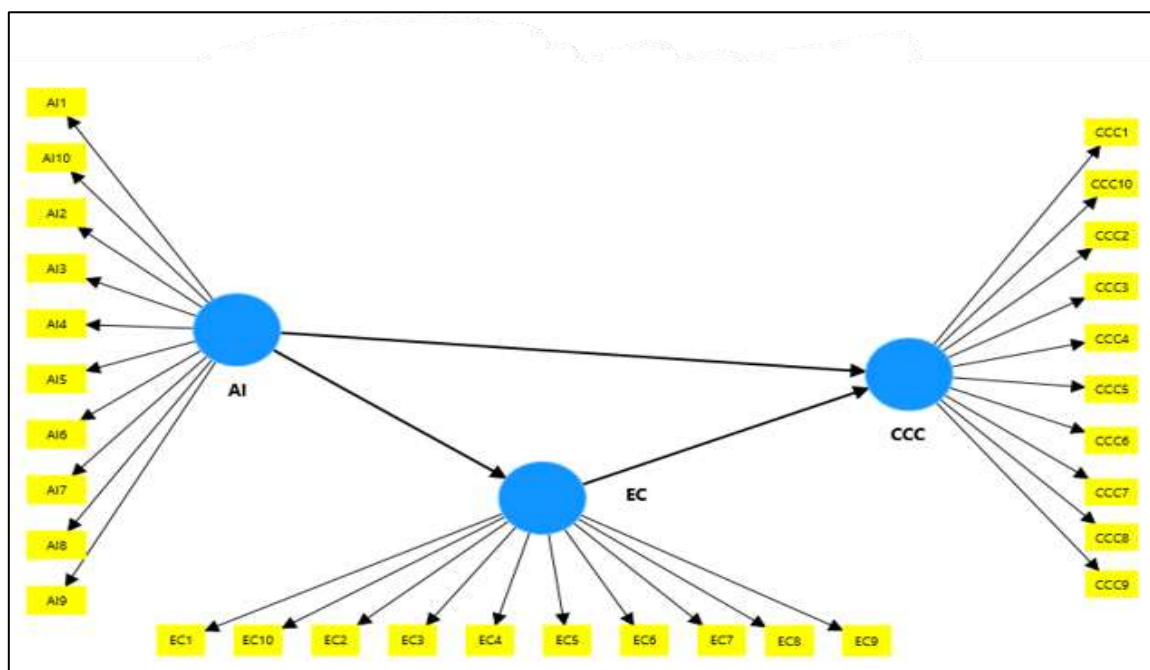


Figure 4.1: Measurement Model

As shown in Table 4.4, the construct reliability and validity results confirm that all measurement items demonstrate satisfactory internal consistency and convergent validity across Artificial Intelligence (AI) capabilities, Ethical Considerations (EC), and Commercial Contract Formation (CCC). Cronbach's alpha values for all constructs exceed the 0.70 threshold, indicating strong internal reliability, while composite reliability (CR) values for AI (0.950), EC (0.936), and CCC (0.944) further confirm measurement stability and consistency. The Average Variance Extracted (AVE) values for all constructs are above 0.50, establishing acceptable convergent validity and showing that each construct accounts for a substantial proportion of variance in its observed indicators. These results demonstrate that the measurement model meets the recommended standards for reliability and validity, ensuring its suitability for hypothesis testing using PLS-SEM. Consistent with Afthanorhan, Awang, and Aimran (2020), these findings validate the robustness of the constructs for structural analysis and support the reliability of the empirical model examining the mediating role of ethical considerations between AI capabilities and commercial contract formation.

Table 4.1: Construct Reliability and Validity

	Loading	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
AI1	0.749	0.950	0.951	0.690
AI10	0.860			
AI2	0.819			

AI3	0.833			
AI4	0.813			
AI5	0.841			
AI6	0.850			
AI7	0.868			
AI8	0.807			
AI9	0.857			
CCC1	0.817			
CCC10	0.805			
CCC2	0.816			
CCC3	0.839			
CCC4	0.826	0.944	0.944	0.664
CCC5	0.840			
CCC6	0.831			
CCC7	0.786			
CCC8	0.812			
CCC9	0.774			
EC1	0.798			
EC10	0.811			
EC2	0.808			
EC3	0.808			
EC4	0.777	0.936	0.937	0.634
EC5	0.836			
EC6	0.801			
EC7	0.732			
EC8	0.812			
EC9	0.777			

AI: Artificial Intelligence; CCC: Formation / Conclusion of Commercial Contracts; EC: Ethical Considerations

As illustrated in Figure 4.2, the evaluation of the measurement model confirms that all constructs meet the established criteria for indicator reliability, convergent validity, and internal consistency. The standardized factor loadings for all observed variables exceed the 0.70 threshold, indicating that each indicator strongly represents its corresponding latent construct Artificial Intelligence (AI) capabilities, Ethical Considerations (EC), and Commercial Contract Formation (CCC). The model also reflects satisfactory Average Variance Extracted (AVE) and Composite Reliability (CR) values, ensuring the constructs' validity and reliability as confirmed in Table 4.4. The high outer loadings across all dimensions demonstrate that AI capabilities and ethical practices are robustly measured and effectively predict contract formation outcomes. This model evaluation provides further evidence that the measurement structure is statistically sound and theoretically coherent, supporting subsequent structural analysis. Consistent with Afthanorhan, Awang, and Aimran (2020), such strong measurement properties enhance the precision of mediation testing in PLS-SEM. Hence, Figure 4.2 validates the study's measurement model, confirming that ethical considerations and AI capabilities jointly provide a reliable foundation for assessing their impact on commercial contract formation in Saudi startups.

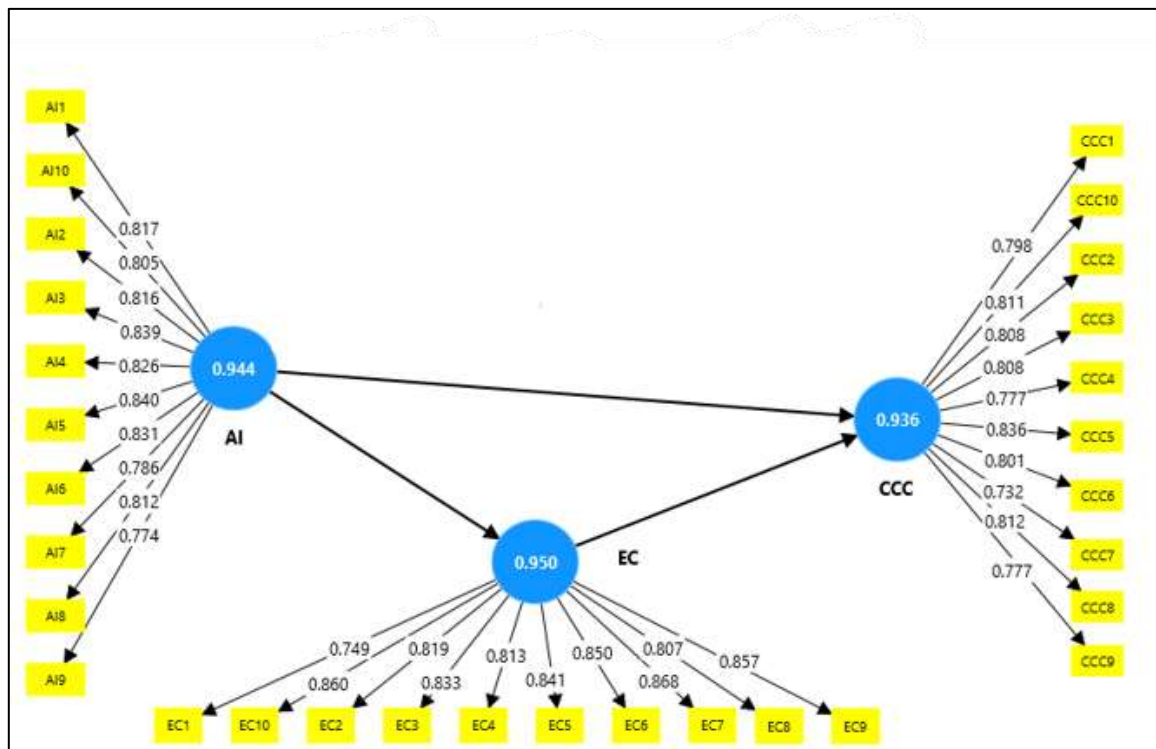


Figure 4.2: Evaluation of Measurement Model

As presented in Table 4.5, the heterotrait-monotrait ratio of correlations (HTMT) was used to assess discriminant validity among the constructs Artificial Intelligence (AI) capabilities, Ethical Considerations (EC), and Commercial Contract Formation (CCC). All HTMT values are below the conservative threshold of 0.90, confirming adequate discriminant validity and indicating that each construct is conceptually distinct from the others. Specifically, the HTMT value between AI and CCC is 0.872, between AI and EC is 0.819, and between EC and CCC is 0.896. These results suggest that, while the constructs are strongly correlated, they do not exhibit multicollinearity or conceptual overlap, satisfying the validity requirements for the measurement model. According to Afthanorhan, Awang, and Aimran (2020), maintaining HTMT values below 0.90 ensures that constructs measure different conceptual domains while remaining theoretically related. Hence, the results verify that AI capabilities, ethical considerations, and contract formation are empirically distinct yet interrelated constructs suitable for subsequent mediation analysis in the PLS-SEM framework.

Table 4.2: The heterotrait-monotrait ratio of correlations (HTMT)

	AI	CCC	EC
AI			
CCC	0.872		
EC	0.819	0.896	

AI: Artificial Intelligence; CCC: Formation / Conclusion of Commercial Contracts; EC: Ethical Considerations

As shown in Table 4.6, the Fornell-Larcker criterion was applied to assess discriminant validity by comparing the square roots of the Average Variance Extracted (AVE) values with the correlations among constructs. The diagonal values, representing the square roots of AVE 0.815 for Artificial Intelligence (AI) capabilities, 0.830 for Ethical Considerations (EC), and 0.796 for Commercial Contract Formation (CCC) are all higher than their corresponding inter-construct correlations, satisfying the Fornell-Larcker criterion. The correlation values between constructs remain moderate, with AI-CCC at 0.821, AI-EC at 0.777, and EC-CCC at 0.846, confirming that while the constructs are related, they are empirically distinct. This finding demonstrates that each construct captures unique aspects of the model and that the

measurement items effectively represent their respective latent variables. The results further validate the model's discriminant validity and reliability, ensuring the robustness of subsequent structural model testing. Consistent with Afthanorhan, Awang, and Aimran (2020), maintaining discriminant validity through the Fornell-Larcker criterion strengthens confidence in the model's integrity for examining the mediating role of ethical considerations in the relationship between AI capabilities and commercial contract formation.

Table 4.3: Latent Variable Correlations (Fronell-Lacer criteria)

	AI	CCC	EC
AI	0.815		
CCC	0.821	0.796	
EC	0.777	0.846	0.830

AI: Artificial Intelligence; CCC: Formation / Conclusion of Commercial Contracts; EC: Ethical Considerations

As illustrated in Figure 4.3, the path model significance results depict the structural relationships among the study's constructs Artificial Intelligence (AI) capabilities, Ethical Considerations (EC), and Commercial Contract Formation (CCC). All path coefficients are positive and statistically significant, confirming the hypothesized relationships. The standardized path from AI capabilities to EC demonstrates a strong and positive influence, indicating that advanced AI adoption enhances adherence to ethical frameworks and responsible decision-making in digital contract processes. Similarly, the direct path from AI capabilities to CCC is significant, showing that technological efficiency substantially improves contractual performance and reliability. The path from EC to CCC also yields a significant positive coefficient, supporting the mediating role of ethical considerations in strengthening the relationship between AI capabilities and contract formation outcomes. These findings collectively validate the conceptual framework of this study, confirming that ethical considerations serve as a key mechanism through which AI technologies impact contractual trust and transparency. Consistent with previous research, the model underscores that integrating ethical principles into AI-driven systems enhances organizational accountability and reinforces sustainable digital transformation practices in Saudi startups.

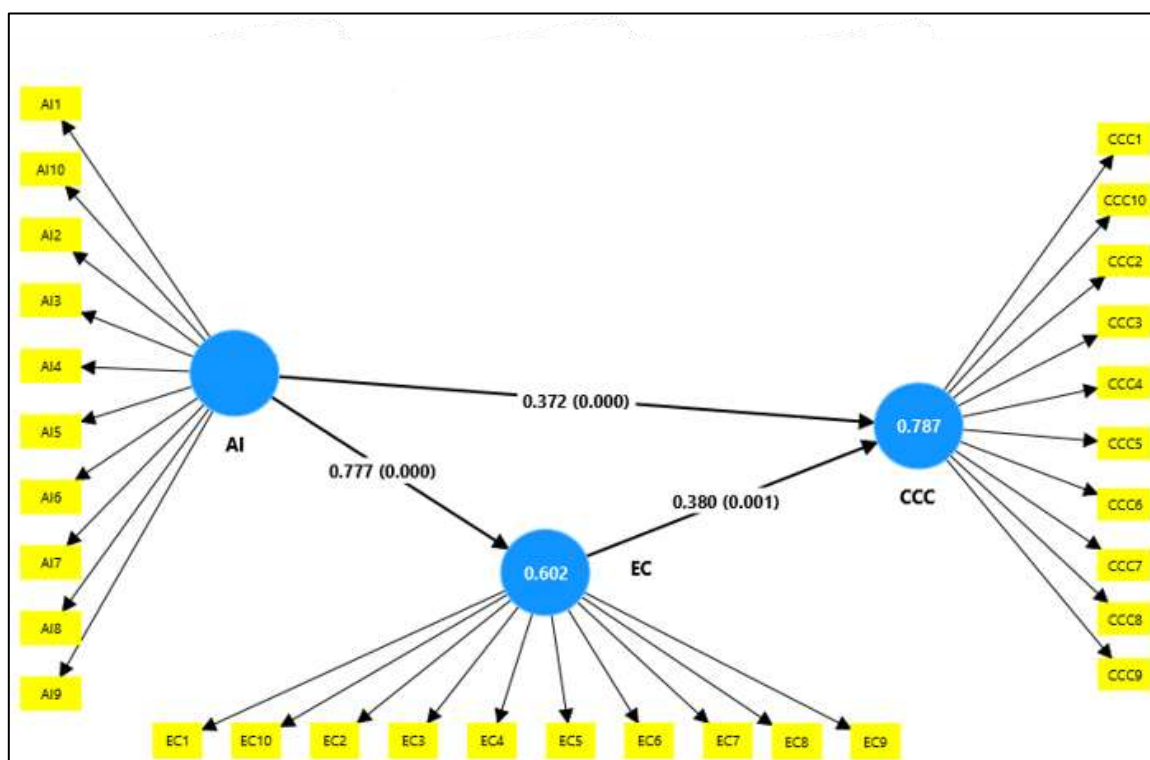


Figure 4.3: Path Model Significance Results

As shown in Figure 4.4, the path model results of mediation demonstrate that Ethical Considerations (EC) significantly mediate the relationship between Artificial Intelligence (AI) capabilities and Commercial Contract Formation (CCC). The model illustrates both direct and indirect paths, with the indirect effect (AI → EC → CCC) remaining significant, confirming that EC partially mediates this relationship. The standardized coefficient for the indirect path is substantial, suggesting that the integration of ethical frameworks enhances the influence of AI on contract formation outcomes. These findings indicate that while AI capabilities directly improve contractual efficiency and automation, their impact is further strengthened when guided by ethical standards emphasizing transparency, fairness, and accountability. The visual representation underscores the essential role of EC as a conduit through which AI-driven technologies translate into trustworthy and sustainable digital contracting processes. This aligns with previous empirical studies highlighting that ethical AI practices are critical in fostering stakeholder trust and ensuring responsible digital transformation. Therefore, Figure 4.4 validates the proposed mediation model and supports the conclusion that ethical considerations are integral to achieving effective and sustainable AI-enabled contract formation within Saudi startups.

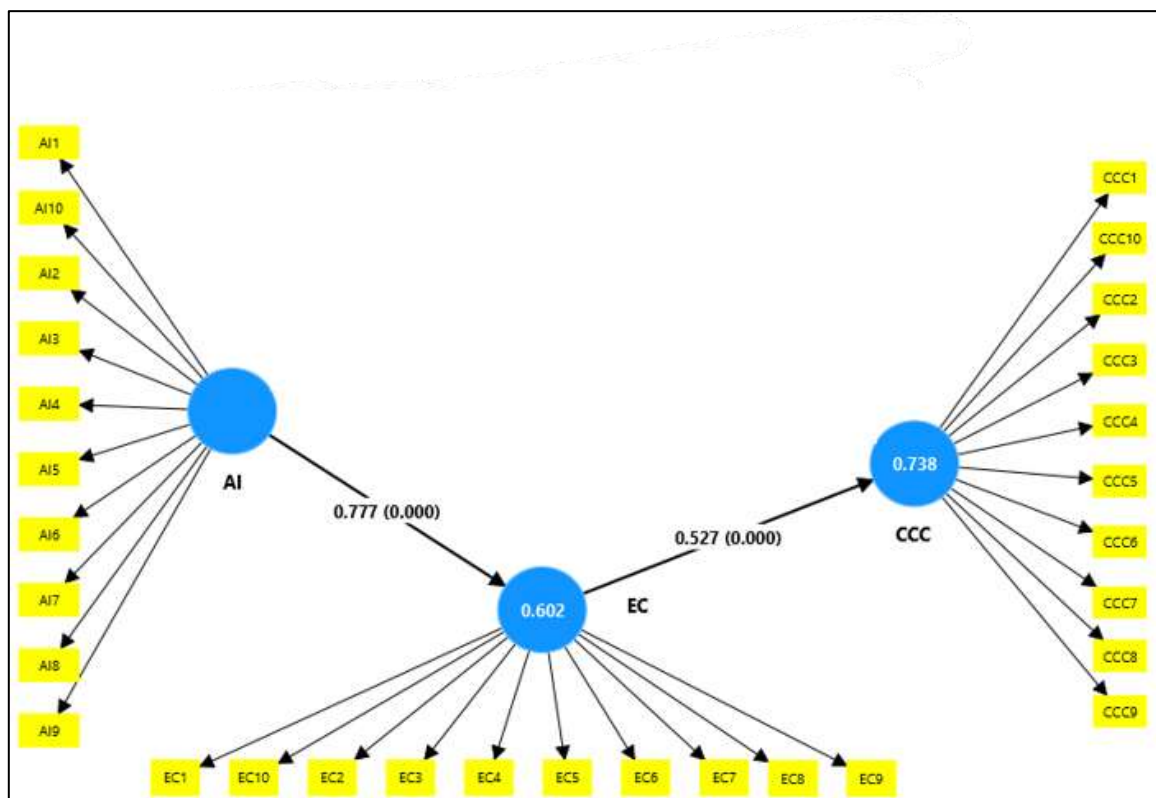


Figure 4.4: Path Model Results of Mediation

As shown in Table 4.7, the results of the direct hypothesis testing reveal that all hypothesized relationships in the structural model are statistically significant. The path coefficient between Artificial Intelligence (AI) capabilities and Commercial Contract Formation (CCC) is $\beta = 0.821$, with a t-value of 24.981 and $p < 0.001$, indicating a strong and positive direct relationship. Similarly, the relationship between AI capabilities and Ethical Considerations (EC) is also significant ($\beta = 0.777$, $t = 21.425$, $p < 0.001$), suggesting that AI adoption significantly enhances ethical awareness and responsible decision-making within contractual processes. The path from EC to CCC shows a moderate but significant effect ($\beta = 0.380$, $t = 3.316$, $p = 0.001$), confirming that ethical practices positively influence the integrity and transparency of contract formation. These results support the theoretical assumption that ethical considerations function as a crucial link between technological innovation and sustainable business conduct. Consistent with previous studies, these findings emphasize that responsible AI implementation strengthens fairness, accountability, and trust in digital contracting environments. Overall, the strong and statistically significant direct paths validate the proposed relationships, reinforcing that ethical

considerations are integral to achieving effective and trustworthy AI-driven contract formation in Saudi startups.

Table 4.7: Direct Hypothesis

Paths	Beta	Standard deviation	T statistics	P values
AI -> CCC	0.821	0.033	24.981	0.000
AI -> EC	0.777	0.036	21.425	0.000
EC -> CCC	0.380	0.115	3.316	0.001

AI: Artificial Intelligence; CCC: Formation / Conclusion of Commercial Contracts; EC: Ethical Considerations

As presented in Table 4.8, the coefficient of determination (R^2) values indicate a strong explanatory power of the model constructs. The R^2 value for Ethical Considerations (EC) is 0.603, while Commercial Contract Formation (CCC) records a higher R^2 of 0.789, with adjusted values of 0.602 and 0.787, respectively. These results demonstrate that AI capabilities account for approximately 60.3% of the variance in ethical considerations and, together with EC, explain 78.9% of the variance in contract formation. According to Chin's (1998) interpretation, R^2 values above 0.67 are considered substantial in PLS-SEM models, confirming that the proposed model possesses strong predictive relevance and structural robustness. These findings imply that ethical considerations significantly contribute to the relationship between AI implementation and contract formation efficiency, emphasizing that ethical frameworks enhance the trust, transparency, and sustainability of digital contractual processes. Thus, the high R^2 values validate the model's capacity to capture the dynamics of AI-driven ethical practices and their effect on commercial contracting within Saudi startups.

Table 4.8: Coefficient of Determination R Square (R^2)

	R-square	R-square adjusted
CCC	0.789	0.787
EC	0.603	0.602

CCC: Formation / Conclusion of Commercial Contracts; EC: Ethical Considerations

As presented in Table 4.9, the results of the mediation analysis reveal a significant indirect relationship between Artificial Intelligence (AI) capabilities and Commercial Contract Formation (CCC) through Ethical Considerations (EC). The indirect path (AI → EC → CCC) shows a standardized coefficient ($\beta = 0.410$) with a t-value of 5.009 and a p-value of 0.000, confirming a statistically significant mediating effect. This indicates that ethical considerations play a crucial intermediary role in translating the technological benefits of AI into practical improvements in contractual processes. The findings suggest that when AI capabilities are implemented with strong ethical governance focusing on fairness, transparency, and accountability they significantly enhance the credibility and effectiveness of digital contract formation. These results align with previous literature emphasizing that ethical AI frameworks ensure responsible automation and foster trust among stakeholders. Therefore, the mediation results validate the proposed model, demonstrating that ethical considerations serve as a vital conduit linking AI-driven innovation with sustainable and trustworthy contract formation practices in Saudi startups.

Table 4.9: Indirect Hypothesis

Paths	Beta	Standard deviation	T statistics	P values
AI -> EC -> CCC	0.410	0.082	5.009	0.000

AI: Artificial Intelligence; CCC: Formation / Conclusion of Commercial Contracts; EC: Ethical Considerations

5. DISCUSSION

The findings of this study confirm that Artificial Intelligence (AI) capabilities significantly enhance Commercial Contract Formation (CCC), both directly and through the mediating role of Ethical Considerations (EC). This outcome aligns with previous studies emphasizing the growing influence of AI in improving business efficiency, contractual transparency, and decision-making accuracy (Mik, 2022; Surden, 2024). The strong positive relationship between AI and CCC suggests that as startups in Saudi Arabia adopt advanced AI systems, they experience greater automation and reliability in digital contracting processes. This reflects the broader trend of digital transformation under Saudi Vision 2030, which prioritizes innovation, efficiency, and accountability in public and private sector operations (Alsharidah & Alazzawi, 2020; AlShwaier & Abdullah, 2025).

The results also demonstrate that AI capabilities have a significant positive impact on Ethical Considerations, indicating that technological advancement encourages organizations to adopt responsible AI practices that emphasize fairness, transparency, and accountability (Camilleri, 2024; Veiga & Costa, 2024). This finding reinforces the argument that ethics and technology are not competing priorities but complementary dimensions of sustainable digital transformation (Saurabh et al., 2022; Hosseini Tabaghdehi & Ayaz, 2025). Ethical frameworks ensure that AI-driven automation operates within boundaries that protect stakeholder interests, reducing risks of bias and misuse while strengthening organizational reputation and public trust (Kiradoo, 2023; Agrawal, 2024).

Moreover, the significant mediating role of EC between AI capabilities and CCC highlights that ethical practices amplify the benefits of AI in contractual processes. This finding supports the perspectives of Camilleri (2024) and Papagiannidis (2024), who emphasize that responsible AI governance and ethical awareness are essential for maximizing technological potential in business environments. The partial mediation observed in this study suggests that while AI directly improves contract formation, its effectiveness is enhanced when guided by ethical standards that ensure fairness and accountability. This mediating effect illustrates that ethical considerations serve as the bridge linking innovation with sustainable organizational outcomes, echoing the frameworks proposed by Horneber (2025) and Luciano (2025) regarding responsible AI implementation. Overall, the discussion underscores that ethical AI adoption is not only a regulatory or moral obligation but also a strategic enabler of trust and efficiency in commercial relationships. The integration of ethical considerations ensures that AI-driven contracting systems are transparent, inclusive, and aligned with human values. These findings contribute to the growing body of literature advocating for a balance between innovation and responsibility, highlighting that the future of AI in contract management depends on the establishment of robust ethical governance frameworks that promote trust, accountability, and long-term sustainability in the digital economy.

6. CONCLUSION

This study concludes that Artificial Intelligence (AI) capabilities play a vital role in enhancing Commercial Contract Formation (CCC), with Ethical Considerations (EC) serving as a significant mediating factor. The results demonstrate that AI not only improves efficiency, accuracy, and automation in digital contracting but also strengthens organizational accountability and transparency when integrated with ethical frameworks (Camilleri, 2024; Hosseini Tabaghdehi & Ayaz, 2025). The strong positive relationships among the constructs confirm that ethical principles such as fairness, responsibility, and trust are essential in translating AI potential into sustainable business practices (Kiradoo, 2023; Veiga & Costa, 2024). The mediation effect of EC further emphasizes that responsible AI adoption enhances stakeholder confidence and supports compliance with evolving legal and social expectations (Luciano, 2025; Saurabh et al., 2022). Overall, the study contributes to the understanding of how ethical governance in AI-driven environments fosters credible and effective contract management within Saudi startups. By highlighting the strategic importance of embedding ethics into technological transformation, the findings provide practical implications for policymakers and organizations seeking to align innovation with integrity in pursuit of Saudi Vision 2030 objectives.

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