

The Impact of Big Data Analytics Usage on Audit Quality Evidence from Saudi Arabia

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Abstract: This study examines the impact of Big Data Analytics (BDA) usage on audit quality in the Saudi Arabian context. Drawing on a modified Technology Acceptance Model framework, the research employs a survey questionnaire method targeting external auditors working in audit firms operating in Saudi Arabia. The findings reveal that BDA usage significantly positively influences audit quality, with system quality and perceived usefulness serving as key drivers of BDA adoption. The results also indicate that auditor competencies moderate the relationship between BDA usage and audit quality. These findings contribute to the growing literature on technology adoption in auditing and provide practical insights for regulators, audit firms, and professional bodies in Saudi Arabia as they navigate the digital transformation of the audit profession under Vision 2030. The study offers implications for the Saudi Organization for Chartered and Professional Accountants (SOCPA), the Capital Market Authority (CMA), and audit firms seeking to enhance audit quality through technological innovation.

Keywords: Big Data Analytics, Audit Quality, Technology Adoption, Saudi Arabia, Vision 2030, External Auditing.

Jel Classification Codes: M42, M41, O33.

1. INTRODUCTION

The audit profession is undergoing a fundamental transformation driven by rapid technological advancements, particularly the emergence of Big Data Analytics (BDA). As organizations generate increasingly vast volumes of structured and unstructured data, traditional audit approaches based on sampling are giving way to more comprehensive, data-driven methodologies. BDA enables auditors to analyse entire populations of transactions, identify anomalies, and provide deeper insights into client operations, thereby potentially enhancing audit quality. (Hosni et al., 2024).

In the Kingdom of Saudi Arabia, this technological transformation coincides with unprecedented economic and regulatory changes under Vision 2030. The Saudi government has launched ambitious economic diversification initiatives, attracting foreign investment and necessitating enhanced transparency and accountability in financial reporting (Grant Thornton Saudi Arabia, 2025). Regulatory bodies, including the Capital Market Authority (CMA) and the Saudi Organization for Chartered and Professional Accountants (SOCPA), have introduced far-reaching reforms designed to raise audit quality and align local practices with international standards (Grant Thornton Saudi Arabia, 2025; Ministry of Commerce, Saudi Arabia, 2025).

Despite the global momentum toward data-driven auditing, empirical evidence on the impact of BDA usage on audit quality remains limited, particularly in emerging market contexts. Most existing studies have focused on developed economies or conceptual frameworks, leaving a

gap in understanding how BDA affects audit outcomes in settings characterized by unique institutional, cultural, and regulator dynamics (Sofyani et al., 2026). Saudi Arabia presents an especially relevant context for such investigation, given its rapid adoption of international auditing standards, mandatory audit firm rotation requirements, and growing emphasis on technology-enabled assurance (Grant Thornton Saudi Arabia, 2025; Alharbi, 2024).

This study addresses this gap by examining the relationship between BDA usage and audit quality in the Saudi Arabian context. Specifically, it seeks to answer the following research questions:

- What factors drive the adoption of BDA among Saudi audit firms?
- Does BDA usage significantly impact audit quality?
- Do auditor characteristics moderate the BDA–audit quality relationship?

The study contributes to the literature in several ways. First, it provides empirical evidence from an emerging market context often overlooked in auditing research. Second, it extends the Technology Acceptance Model (TAM) framework to the auditing domain by incorporating contextual factors relevant to the Saudi profession. Third, it offers practical insights for regulators, audit firms, and professional bodies seeking to enhance audit quality through technological innovation.

The remainder of this paper is organized as follows. Section 2 provides institutional background on the Saudi audit profession. Section 3 reviews the relevant literature and develops the research hypotheses. Section 4 describes the methodology. Section 5 presents the empirical results and discussion. Section 6 concludes the paper with implications, limitations, and future research directions.

2. Institutional Background

2.1 The Evolution of the Audit Profession in Saudi Arabia

The audit profession in Saudi Arabia has undergone significant transformation over the past decade, driven by the Kingdom's ambitious economic diversification agenda under Vision 2030. The regulatory framework governing the profession has evolved to align with international best practices while addressing local specificities (Grant Thornton Saudi Arabia, 2025).

The Law of the Profession of Accounting and Auditing, issued by Royal Decree D/59 in 2021, established the foundation for modern audit regulation in the Kingdom. Recent amendments have transferred licensing authority from the Ministry of Commerce to the Saudi Organization for Chartered and Professional Accountants (SOCPA), streamlining the licensing process and enhancing professional oversight (Ministry of Commerce, Saudi Arabia, 2025). These regulatory changes reflect a broader commitment to strengthening the audit profession's capacity to support economic development and attract foreign investment.

2.2 Regulatory Oversight and Quality Initiatives

Two primary bodies oversee audit quality in Saudi Arabia. The Capital Market Authority (CMA) regulates audit firms licensed to audit entities under its supervision, conducting regular inspections and requiring transparency reports from licensed firms (Grant Thornton Saudi Arabia, 2025). SOCPA simultaneously reviews practicing firms,

examining both firm-level quality control systems and individual engagement working papers. These inspections have become increasingly robust, with clearly defined consequences for deficiencies, driving continuous improvement in audit quality.

Key regulatory developments shaping the assurance landscape include mandatory audit firm rotation to promote independence, expanded audit committee responsibilities, and full alignment with International Standards on Auditing (ISAs) and IFRS Accounting Standards (Ministry of Commerce, Saudi Arabia, 2025). SOCPA has endorsed the International Code of Ethics for Professional Accountants, including independence standards, and firms must now conduct annual evaluations of their systems of quality management.

2.3 Technology Adoption in the Saudi Audit Profession

Technology is playing an increasingly central role in the Saudi audit profession. Large and medium-sized firms are adopting data analytics tools, artificial intelligence, and digital platforms that enable deeper analysis, full population testing, and near real-time anomaly detection (Grant Thornton Saudi Arabia, 2025; Alharbi, 2024). These tools allow auditors to move beyond traditional sampling approaches and provide more insightful assurance.

However, the adoption of BDA in Saudi Arabia is not uniform across firms. Research by Alharbi (2024) identifies several factors influencing investment decisions in audit data analytics technologies, including technological readiness, organizational support, regulatory pressures, and client requirements. The study reveals that Saudi audit firms consider technological factors (relative advantage, compatibility, complexity), organizational factors (leadership support, auditor competencies), and external environmental factors (regulations, competitive pressures) when deciding whether to invest in BDA capabilities.

The Saudi context also presents unique challenges for technology-enabled auditing. Environmental factors such as sandstorms can affect certain technologies like drones, while cybersecurity threats pose risks to data integrity. Nevertheless, the trajectory toward greater technology adoption appears firmly established, supported by regulatory encouragement and the demands of increasingly sophisticated clients.

3. Literature Review and Hypothesis Development

3.1 Defining and Measuring Audit Quality

Audit quality is a multidimensional concept that has received extensive attention in the accounting literature. Francis (2011) conceptualizes audit quality along input, process, and output dimensions, encompassing auditor characteristics, engagement procedures, and audit outcomes such as financial reporting quality. Knechel et al. (2013) similarly emphasize that audit quality arises from complex interactions between auditors, clients, and the regulatory environment.

Empirical research on audit quality has relied on various proxies, including auditor size, abnormal audit fees, accrual quality, and the propensity to meet or beat analyst targets. However, van Raak and Thürheimer (2016) raise concerns about the validity of these remote proxies, noting that their performance in predicting actual audit deficiencies is often poor. This study adopts a perceptual measure of audit quality, capturing auditors' assessments of how BDA usage affects their ability to detect material misstatements, exercise professional judgment, and deliver high-quality audits.

A systematic literature review by Oudda et al. (2023) identifies 48 factors potentially influencing audit quality, categorized into auditor-related factors (competence, independence, professional

skepticism), client-related factors (governance quality, complexity, internal control effectiveness), and market-related factors (regulatory oversight, competition, litigation risk). Notably, client characteristics received the most attention in the reviewed studies, accounting for 44% of the analysis.

3.2 Big Data Analytics in Auditing

Big Data Analytics in auditing refers to the use of advanced analytical techniques to examine large and diverse datasets for audit evidence. Appelbaum et al. (2017) describe how BDA enables auditors to analyze entire populations of transactions rather than relying on samples, potentially increasing both the effectiveness and efficiency of audits. Earley (2015) discusses opportunities and challenges, noting that while BDA can enhance fraud detection and risk assessment, it also requires new skills and may introduce complexity in audit judgments.

The adoption of BDA in auditing has been examined through various theoretical lenses. Dagilienė and Klovienė (2019) explore motivations for BDA adoption, finding that external auditors focus on procedures that satisfy regulatory requirements while also providing value to clients. De Santis and D'Onza (2021) examine how auditors seek legitimacy for BDA use, highlighting the importance of professional standards and client acceptance.

Recent systematic reviews synthesize the growing body of research on BDA in auditing. Hosni et al. (2024), analyzing 97 scientific articles, identify the importance of IT knowledge, data categorization skills, and diverse competencies for effective BDA utilization. Challenges include data volume, lack of standards, and negative perceptions among some stakeholders. The integration of advanced technologies such as artificial intelligence and blockchain shows promise for revolutionizing audit practices.

3.3 BDA and Audit Quality: Empirical Evidence

Empirical evidence on the relationship between BDA usage and audit quality is accumulating but remains limited, particularly in emerging markets. Ditkaew and Suttipun (2023) examine the impact of audit data analytics on audit quality in Thailand, finding positive associations consistent with resource advantage theory. Serag and Al-Aqiliy (2020) proposes a framework for BDA in external auditing based on contingency theory, identifying audit firm size, information systems infrastructure, and engagement characteristics as factors influencing BDA benefits.

In the public sector context, Sofyani (2025) investigates BDA adoption among Indonesian government auditors, finding that BDA usage improves audit performance, judgment, and quality. The study also reveals that audit judgment mediates the BDA–audit quality relationship, while audit performance does not. Another study of Indonesian public sector auditors Sofyani et al. (2026) finds that system quality positively influences perceived ease of use and usefulness, which drive adoption intentions and subsequent BDA usage, ultimately improving audit performance and quality.

Research specifically focused on Saudi Arabia remains scarce. Alharbi (2024) provides comprehensive qualitative evidence on audit data analytics adoption in the Kingdom, identifying technological, organizational, and environmental factors influencing investment decisions. Alsughayer (2021) examines auditor competence, integrity, and ethics in relation to audit quality in Saudi Arabia, providing baseline evidence on auditor characteristics. However, quantitative evidence on the BDA–audit quality relationship in the Saudi context is lacking.

3.4 Theoretical Framework and Hypothesis Development

This study draws on the Technology Acceptance Model (TAM) as extended by Sofyani et al. (2026) to the auditing context. TAM posits that perceived ease of use and perceived usefulness drive technology adoption intentions, which in turn lead to actual usage. In the auditing context, system quality serves as an external variable influencing these perceptions. The framework also incorporates auditor certification as a potential moderating variable, recognizing that professional credentials may shape how BDA usage translates into audit outcomes.

Based on this framework and the reviewed literature, we develop the following hypotheses:

3.4.1 System Quality and Perceived Ease of Use

System quality the reliability, responsiveness, and functionality of BDA systems has been consistently identified as a fundamental antecedent to perceived ease of use in technology acceptance research (Sofyani et al., 2026). When systems are reliable and responsive, users find them easier to learn and operate, reducing cognitive effort and enhancing accessibility (Sofyani, 2025). In the Saudi context, Alharbi (2024) found that technological readiness, including system reliability and infrastructure quality, significantly shapes auditors' willingness to engage with BDA tools. Therefore, we hypothesize that Saudi auditors who perceive BDA systems as high-quality will find them easier to use.

H1: System quality positively influences perceived ease of use of BDA among Saudi auditors.

3.4.2 System Quality and Perceived Usefulness

Beyond ease of use, system quality also directly shapes users' perceptions of technology usefulness, as reliable systems reinforce beliefs about their value for job performance (Sofyani et al., 2026; Ditkaew&Suttipun, 2023). Sofyani et al. (2026) demonstrated that system quality has a direct positive effect on perceived usefulness among Indonesian government auditors, independent of its effect through PEOU. In Saudi Arabia, Alharbi (2024) found that firms with higher-quality systems reported greater confidence in BDA's ability to enhance audit quality. Thus, we propose that system quality enhances Saudi auditors' perceptions of BDA usefulness.

H2: System quality positively influences perceived usefulness of BDA among Saudi auditors.

3.4.3 Perceived Ease of Use and Perceived Usefulness

The relationship between perceived ease of use and perceived usefulness is well-established in TAM literature: when technology is easy to use, users can accomplish tasks with less effort and focus more on substantive aspects of their work, enhancing its perceived value (Earley, 2015). Sofyani et al. (2026) confirmed this relationship in the auditing context, demonstrating that intuitive BDA tools enable auditors to devote more cognitive resources to interpreting results rather than struggling with technical complexities. Abu Al Rob et al. (2025) found that PEOU significantly influences PU among Palestinian Big Four auditors, with qualitative interviews confirming that user-friendly tools enhance recognition of BDA's potential benefits. Hence, we hypothesize that Saudi auditors who find BDA easy to use will perceive it as more useful.

H3: Perceived ease of use positively influences perceived usefulness of BDA.

3.4.4 Perceived Ease of Use and Adoption Intention

Perceived ease of use has been consistently identified as a key driver of technology adoption intentions, as low expected effort and manageable learning curves increase willingness to incorporate new tools into professional practice (Appelbaum et al., 2017; Sofyani, 2025). Sofyani (2025) found that ease of use significantly predicts adoption intentions among Indonesian government auditors. Abu Al Rob et al. (2025) demonstrated that PEOU influences behavioral intentions among Palestinian auditors, though its effect is somewhat weaker than perceived usefulness.

H4: Perceived ease of use positively influences intention to adopt BDA.

3.4.5 Perceived Usefulness and Adoption Intention

Perceived usefulness is often the strongest predictor of technology adoption intentions across various contexts, as users adopt technologies they believe will enhance their performance and outcomes (Ditkaew&Suttipun, 2023; Hosni et al., 2024). Ditkaew and Suttipun (2023) found that perceived usefulness strongly drives audit data analytics adoption in Thailand. Sofyani et al. (2026) similarly demonstrated that usefulness perceptions are critical for adoption intentions in the Indonesian public sector.

H5: Perceived usefulness positively influences intention to adopt BDA.

3.4.6 Adoption Intention and Actual BDA Usage

The link between intention and actual behavior is central to TAM and has been validated across numerous contexts, with behavioral intentions serving as the most immediate determinants of actual behavior (Davis, 1989; Sofyani, 2025). Sofyani (2025) confirmed that adoption intentions significantly predict actual BDA usage among Indonesian auditors. Patel and Shah (2023) noted that intention is a reliable predictor of implementation behavior in auditing firms. Abu Al Rob et al. (2025) validated the intention-usage relationship in the Palestinian auditing context, demonstrating that behavioral intentions translate into actual adoption behavior. In Saudi Arabia, Alharbi's (2024) qualitative research suggests that firms with positive intentions toward BDA adoption are more likely to invest in and implement these technologies, with organizational readiness and leadership support facilitating this translation. Technology adoption frameworks for supreme audit institutions emphasize that continuous staff training and management support are essential for translating intentions into actual usage (Ceki & Moloi, 2025). Thus, we propose that adoption intention positively influences actual BDA usage among Saudi auditors.

H6: Intention to adopt BDA positively influences actual BDA usage.

3.4.7 BDA Usage and Audit Quality

The ultimate purpose of BDA adoption is to enhance audit quality, and emerging evidence from multiple contexts supports this relationship (Ditkaew&Suttipun, 2023; Sofyani, 2025). Ditkaew and Suttipun (2023) found that audit data analytics usage positively affects audit quality in Thailand. Sofyani (2025) demonstrated that BDA usage improves audit performance, judgment, and quality in the Indonesian public sector, with audit judgment mediating this relationship. Serag

and Al-Aqiliy (2020) proposed that BDA enhances audit quality through comprehensive analysis, improved risk assessment, and enhanced fraud detection. Hosni et al.'s (2024) systematic review concluded that BDA enhances auditors' abilities to detect fraud and provide more accurate risk assessments by enabling analysis of entire transaction populations. In Saudi Arabia, Alharbi (2024) provided qualitative evidence that firms adopting BDA report quality improvements, including enhanced fraud detection and comprehensive analysis using AI, RFID, drones, and sensors. Best practice reviews for big-data audits in the Saudi context emphasize that integrating BDA into audit practices is essential for maintaining high standards under Vision 2030 (Alharbi, 2024). Therefore, we hypothesize that BDA usage positively influences audit quality.

H7: BDA usage positively influences audit quality.

3.4.8 The Moderating Role of Auditor Competence

While BDA usage can enhance audit quality, its effectiveness may depend on auditor characteristics, with competence encompassing technical knowledge, analytical skills, professional judgment, and qualifications strengthening the BDA–audit quality relationship (Alsughayer, 2021; Sofyani et al., 2026). Alsughayer (2021) demonstrated that auditor competence significantly influences audit quality in Saudi Arabia. Sofyani et al. (2026) found that auditor certification moderates the relationship between BDA adoption and audit outcomes, with certified auditors deriving greater benefits. Lestari and Djamil (2024) confirmed that competence positively influences audit quality, while Prabandari and Rasmini (2024) demonstrated that professional skepticism moderates the influence of competence on audit quality. Hosni et al. (2024) emphasized that IT knowledge and data categorization skills are essential for effective BDA utilization. In Saudi Arabia, Alharbi (2024) identified auditor competencies as a key organizational factor influencing BDA implementation success, with more competent auditors better positioned to realize BDA benefits. The theoretical rationale, grounded in complementarity theory, suggests that technology and human capital are complementary inputs, with benefits maximized when combined with skilled operators (Ceki & Moloi, 2025). Accordingly, we propose that auditor competence moderates the BDA–audit quality relationship.

H8: Auditor competence moderates the relationship between BDA usage and audit quality.

4. Methodology

4.1 Research Design

This study employs a quantitative research design using a survey questionnaire method. This approach is appropriate for examining relationships between variables and testing hypotheses derived from established theory. The survey method allows for data collection from a reasonably large sample of auditors, enabling statistical analysis of the proposed relationships.

4.2 Sample and Data Collection

The target population consists of external auditors working in audit firms operating in Saudi Arabia. Given the absence of a comprehensive sampling frame, the study employs a convenience sampling approach combined with snowball techniques. Questionnaires were distributed

electronically to auditors through professional networks, social media platforms frequented by accounting professionals, and direct contacts with audit firms.

Data collection occurred between March and May 2025. A total of 215 questionnaires were returned, of which 187 were complete and usable for analysis, representing an effective response rate of 87%. This sample size exceeds the minimum requirements for partial least squares structural equation modeling (PLS-SEM) as recommended by Hair et al. (2019).

Table 1 presents the demographic characteristics of the sample.

Table 1. Sample Demographics

Characteristic	Category	Frequency	Percentage
Gender	Male	142	75.9%
	Female	45	24.1%
Experience	< 5 years	58	31.0%
	5-10 years	76	40.6%
	> 10 years	53	28.4%
Position	Junior Auditor	51	27.3%
	Senior Auditor	78	41.7%
	Manager/Partner	58	31.0%
Certification	SOCPA	112	59.9%
	Other Professional	43	23.0%
	None	32	17.1%
Firm Type	Big 4	67	35.8%
	Large Local	54	28.9%
	Medium/Small	66	35.3%

Note. Developed by the author using the study results

4.3 Variable Measurement

All constructs were measured using multiple-item scales adapted from prior research and modified for the Saudi context. Items were rated on five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree).

System Quality was measured using four items adapted from Sofyani et al. (2026), assessing the reliability, responsiveness, and functionality of BDA systems.

Perceived Ease of Use and Perceived Usefulness were measured using scales derived from the TAM literature, with four items each capturing auditors' assessments of BDA usability and benefits.

Intention to Adopt BDA was measured using three items capturing auditors' plans and willingness to use BDA in their engagements.

Actual BDA Usage was measured using four items assessing the extent to which auditors employ BDA tools and techniques in their work.

Audit Quality was measured using five items adapted from prior research, capturing auditors' perceptions of their ability to detect material misstatements, exercise professional skepticism, and deliver high-quality audits.

Auditor Competence was measured using four items adapted from Alsughayer (2021), assessing technical knowledge, analytical skills, and professional qualifications.

4.4 Data Analysis Technique

Data analysis employed partial least squares structural equation modeling (PLS-SEM) using SmartPLS software. PLS-SEM is appropriate for this study because it handles complex models with multiple constructs, does not require normal data distribution, and works effectively with sample sizes typical of survey research in auditing. The analysis followed a two-stage approach: first assessing the measurement model for reliability and validity, then evaluating the structural model for hypothesis testing.

5. Empirical Results

5.1 Descriptive Statistics

Table 2 presents descriptive statistics for the study variables. Mean scores range from 3.42 to 4.01, indicating generally positive perceptions of BDA and audit quality. Standard deviations range from 0.67 to 0.89, suggesting reasonable variation in responses.

Table 2.Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
System Quality	3.89	0.72	1.75	5.00
Perceived Ease of Use	3.67	0.81	1.50	5.00
Perceived Usefulness	4.01	0.69	2.00	5.00
Intention to Adopt	3.92	0.77	1.75	5.00
BDA Usage	3.54	0.89	1.25	5.00
Audit Quality	3.86	0.67	2.00	5.00
AuditorCompetence	3.95	0.71	2.25	5.00

Note. Developed by the author using the study results

Perceived usefulness received the highest mean score (4.01), suggesting that Saudi auditors recognize the potential benefits of BDA for their work. Actual BDA usage received the lowest mean (3.54), indicating that adoption may lag behind perceived benefits a finding consistent with prior research (Hosni,2024) suggesting that BDA implementation in auditing is not as widespread as in other industries.

5.2 Correlation Matrix

Table 3 presents the correlation matrix for the study variables. All correlations are positive and statistically significant at $p < 0.01$, providing preliminary support for the hypothesized

relationships. The strongest correlations involve perceived usefulness with intention to adopt ($r = 0.62$) and BDA usage ($r = 0.58$). Audit quality correlates moderately with BDA usage ($r = 0.49$) and perceived usefulness ($r = 0.45$).

Table 3. Correlation Matrix

variable	1	2	3	4	5	6	7
1. System Quality	1.00						
2. Perceived Ease of Use	0.51	1.00					
3. Perceived Usefulness	0.54	0.48	1.00				
4. Intention to Adopt	0.47	0.53	0.62	1.00			
5. BDA Usage	0.44	0.49	0.58	0.61	1.00		
6. Audit Quality	0.41	0.39	0.45	0.43	0.49	1.00	
7. Auditor Competence	0.38	0.42	0.44	0.40	0.46	0.52	1.00

Note. Developed by the author using the study results

5.3 Regression Results

5.3.1 Measurement Model Assessment

The measurement model was assessed for reliability, convergent validity, and discriminant validity. Composite reliability scores ranged from 0.84 to 0.92, exceeding the recommended threshold of 0.70. Average variance extracted (AVE) ranged from 0.58 to 0.69, exceeding the 0.50 threshold and supporting convergent validity. Discriminant validity was established using the Fornell-Larcker criterion and HTMT ratios, with all HTMT values below 0.85.

5.3.2 Structural Model Assessment

Table 4 presents the structural model results for the hypothesized relationships. The model explains 48% of the variance in BDA usage and 41% of the variance in audit quality, indicating satisfactory explanatory power.

Table 4. Hypothesis Testing Results

Hypothesis		Coeff	t-value	p-value
H1	SQ → PEOU	0.51	8.42	0.000
H2	SQ → PU	0.38	5.91	0.000
H3	PEOU → PU	0.29	4.23	0.000
H4	PEOU → INT	0.31	4.67	0.000
H5	PU → INT	0.47	7.18	0.000
H6	INT → BDAU	0.61	9.84	0.000
H7	BDAU → AQ	0.42	6.35	0.000
H8	AC × BDAU → AQ	0.19	2.84	0.005

Note: SQ = System Quality; PEOU = Perceived Ease of Use; PU = Perceived Usefulness; INT = Intention to Adopt; BDAU = BDA Usage; AQ = Audit Quality; AC = Auditor Competence.

All hypotheses are supported at $p < 0.01$. System quality significantly influences both perceived ease of use ($\beta = 0.51$) and perceived usefulness ($\beta = 0.38$), consistent with H1 and H2. Perceived ease of use positively affects perceived usefulness ($\beta = 0.29$), supporting H3. Both perceived ease of use ($\beta = 0.31$) and perceived usefulness ($\beta = 0.47$) drive adoption intentions, supporting H4 and H5. Intention strongly predicts actual BDA usage ($\beta = 0.61$), supporting H6.

Most importantly for this study's primary research question, BDA usage significantly positively affects audit quality ($\beta = 0.42$, $p < 0.001$), supporting H7. The moderation effect of auditor competence on the BDA–audit quality relationship is also significant ($\beta = 0.19$, $p < 0.01$), supporting H8. This indicates that the benefits of BDA for audit quality are enhanced when auditors possess stronger competencies.

5.4 Discussion

The findings provide strong empirical support for the positive impact of BDA usage on audit quality in the Saudi Arabian context ($\beta = 0.42$, $p < 0.001$). This result aligns with emerging evidence from Thailand (Ditkaew&Suttipun, 2023) and Indonesia (Sofyani, 2025; Sofyani et al., 2026), extending it to Saudi Arabia's unique institutional environment. The significant moderation effect of auditor competence ($\beta = 0.19$, $p < 0.01$) suggests that technology alone is insufficient; human capital development must accompany technological investment, consistent with Alsughayer's (2021) findings on auditor competence in Saudi Arabia.

The technology acceptance findings reveal that system quality serves as a foundation for BDA adoption, aligning with Sofyani et al. (2025). Saudi auditors are more likely to perceive BDA as useful and easy to use when systems are reliable and responsive. This implies that investments in system quality should precede or accompany adoption initiatives, consistent with Alharbi's (2024) identification of technological readiness factors in the Saudi context.

The stronger influence of perceived usefulness ($\beta = 0.47$) compared to perceived ease of use ($\beta = 0.31$) on adoption intentions suggests that Saudi auditors are primarily motivated by instrumental benefits. This aligns with Appelbaum et al. (2017) and Earley (2015), who note that BDA's potential to enhance audit effectiveness drives adoption.

The gap between perceived usefulness (mean = 4.01) and actual BDA usage (mean = 3.54) warrants attention. This finding is consistent with Patel and Shah (2023), who note that BDA implementation in auditing lags behind other industries. Alharbi (2024) identifies similar challenges in Saudi Arabia, including skills gaps and organizational readiness issues, also highlighted in Hosni et al.'s (2024) systematic review.

The moderation finding highlights the complementarity between technology and human capital, supporting Francis's (2011) input-process-output framework and Knechel et al.'s (2013) emphasis on auditor-client-regulatory interactions. This also supports SOCPA's emphasis on professional certification and continuing education (Alsughayer, 2021).

The results have particular significance given Saudi Arabia's regulatory trajectory. The CMA and SOCPA have emphasized technology adoption and quality enhancement as priorities (Grant Thornton Saudi Arabia, 2025; Ministry of Commerce, 2025). Mandatory audit firm rotation and

robust inspection regimes create an environment where audit quality differences have tangible consequences. This aligns with De Santis and D'Onza's (2021) observation that auditors seek legitimacy for BDA use through alignment with professional standards, and Dagilienė and Klovienė's (2019) finding that external auditors focus on procedures satisfying regulatory requirements.

6. CONCLUSION

The study investigated the impact of big data analytics (BDA) usage on audit quality within the Saudi auditing environment and found that the adoption of BDA significantly enhances audit quality. System quality emerged as a key driver of adoption by improving perceived ease of use and usefulness, which subsequently influences both adoption intentions and actual usage. Moreover, auditor competence was identified as a significant moderating factor, demonstrating that technological investments alone are insufficient to improve audit outcomes without parallel investments in human capital and professional expertise. These results suggest that the effective integration of advanced analytical technologies with skilled auditors strengthens assurance processes and contributes to more reliable and transparent audit outcomes.

The research makes a theoretical contribution by extending technology acceptance models to the auditing domain in an emerging market context. This extension illustrates that frameworks originally developed for information systems research can effectively explain technology adoption behaviours in audit settings. Empirical evidence from the Saudi context further enriches the literature by demonstrating how technological innovations interact with institutional and professional factors to influence audit quality. The identification of auditor competence as a moderating variable advances theoretical understanding by highlighting the conditions under which technological adoption translates into measurable quality improvements.

From a practical perspective, the findings underscore the importance of a dual strategy that combines technological investment with professional capacity building. Audit firms seeking to enhance quality outcomes should not rely solely on the implementation of big data analytics but must also prioritize system reliability, user-friendly interfaces, and continuous professional development to strengthen analytical and interpretative skills. Regulatory and professional bodies are encouraged to support these initiatives through policies and programs that promote technological innovation and professional education, as such efforts align with broader objectives of enhancing transparency and governance. Educational institutions also play a critical role by integrating data analytics competencies into accounting and auditing curricula, ensuring that future professionals are equipped to operate effectively in data-driven environments.

The study acknowledges certain limitations. The use of perceptual measures of audit quality may not fully capture objective quality indicators, and the cross-sectional design restricts the ability to draw causal inferences. Future research could address these limitations by employing longitudinal methodologies and incorporating objective measures of audit outcomes. Comparative studies across different jurisdictions would further enhance generalizability and deepen understanding of contextual influences on technology adoption and audit effectiveness. Additionally, examining potential risks associated with big data analytics—such as over-reliance on automated processes

and data governance challenges—would provide a more comprehensive understanding of technological transformation in auditing.

The findings demonstrate that big data analytics has the potential to enhance audit quality in Saudi Arabia when combined with professional competence and supportive organizational conditions. The results emphasize the importance of aligning technological investments with human capital development and robust system design to achieve sustainable quality improvements. As the auditing profession continues to evolve in response to technological change, the integration of advanced analytics with professional judgment will remain essential for strengthening governance, enhancing investor confidence, and supporting market development.

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