

Analysis of the Relationship Between E-Commerce Business and Technology-Based Accounting Information Systems with Company Audit Needs

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ABSTRACT

This study explores the relationship between E-commerce business operations, Technology-Based Accounting Information Systems (AIS) adoption, and corporate audit needs through a quantitative analysis approach. Drawing on data collected from 234 participants representing E-commerce firms and audit professionals, the study employs Structural Equation Modeling (SEM) with Partial Least Squares (PLS) to analyze the relationships among key variables. The findings reveal significant positive associations between E-commerce characteristics and Technology-Based AIS adoption, as well as between Technology-Based AIS adoption and corporate audit needs. Furthermore, mediation analysis demonstrates that Technology-Based AIS adoption partially mediates the relationship between E-commerce characteristics and corporate audit needs. Additionally, moderation analysis indicates that firm size and industry type moderate these relationships, with larger firms and those in technology-intensive industries exhibiting stronger associations. These findings underscore the importance of technological innovation and organizational context in shaping audit readiness and effectiveness within E-commerce environments.

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1. INTRODUCTION

The advent of E-commerce has brought transformative waves in the contemporary business landscape, reshaping traditional business models and offering unprecedented opportunities for global trade and market expansion [1]. E-commerce, characterized by the electronic exchange of goods and services, has revolutionized business operations, customer interactions, and transaction management, pushing

organizations to adapt and innovate in response to ever-evolving market dynamics [2]. This digital revolution not only redefines consumer behavior but also drives dematerialization and individualization in business management, creating new customer-supplier relationships [3]. As the e-Commerce market continues to rapidly evolve with new business models and products, understanding how it works and addressing emerging trends and challenges is

of paramount importance to academic researchers and practitioners alike.

Technology-based Accounting Information Systems (AIS) are critical to the success of E-commerce ventures [4], [5]. AIS not only automates accounting processes but also improves data accuracy and offers real-time insights into financial performance metrics [6]. The development of e-commerce and technology-based AIS significantly affects the need for e-commerce audit services. In addition, e-commerce and AIS positively impact the performance of Micro, Small, and Medium Enterprises (MSMEs) in the industrial sector [7]. AIS, through factors such as information quality and system usage, has been instrumental in improving business performance, as evidenced in Sudanese banks. Overall, AIS plays an important role in facilitating the smooth processing, recording, and reporting of financial information within E-commerce companies, by utilizing technological advances for efficient financial management.

The integration of E-commerce platforms with Artificial Intelligence Systems (AIS) introduces new challenges for corporate auditing, impacting the accuracy and reliability of financial reporting [8]. Auditing AI systems involves addressing issues of fairness, bias, and accountability, which can be complicated due to the black-box nature of AI and the introduction of expert auditors as mediators [9]. AI technology in financial accounting and reporting improves data processing capabilities, but standardization is essential for high-quality systems [10]. Implementing AI-based capabilities in traditional software systems faces hurdles such as resource limitations and uncertain requirements, thus requiring careful integration processes and solutions to ensure effectiveness [11]. The dynamic nature of E-commerce transactions and the complexity of AIS pose challenges for auditors in assessing internal controls, verifying data, and detecting fraud, which emphasizes the need for robust audit practices in the ever-evolving digital landscape.

Against this backdrop, there exists a compelling need to examine the relationship

between E-commerce businesses, Technology-Based AIS adoption, and corporate audit needs. While prior research has explored the impact of E-commerce on accounting practices and the role of AIS in business operations, there is a notable gap in understanding the specific dynamics and interdependencies among these variables. A comprehensive analysis is warranted to quantify the extent of AIS adoption in E-commerce enterprises, assess the influence of E-commerce characteristics on AIS functionality, and elucidate the evolving needs of corporate audits in the digital age.

2. LITERATURE REVIEW

2.1 Evolution of E-Commerce and Accounting Information Systems

The evolution of E-commerce has revolutionized business operations, thus requiring advancements in accounting information systems (AIS) to meet the complexities of online transactions [4], [6]. From manual processes to modern solutions utilizing cloud computing, artificial intelligence, and blockchain, AIS has adapted to the demands of E-commerce, automating tasks and offering real-time financial insights [12]. This shift improves operational efficiency and decision-making by providing accurate financial performance metrics immediately [13]. The synergy between E-commerce and AIS underscores the critical role of technology in streamlining financial management processes and facilitating seamless transactions in the digital age.

2.2 Role of AIS in E-Commerce Businesses

Technology-based AIS in E-commerce businesses serves as the backbone of financial management and reporting, facilitating various accounting functions like order processing and payment reconciliation [14], [15]. By integrating E-commerce platforms with AIS, businesses achieve consistent and accurate financial data synchronization across channels and transactions. These systems offer tailored features such as automated tax calculations and multi-currency support, aiding in

adapting to market conditions and regulatory requirements [16]. The scalability and flexibility of Technology-Based AIS are crucial for E-commerce enterprises aiming to scale operations, enter new markets, and outperform competitors in the dynamic digital landscape [11].

2.3 Challenges in Corporate Audits within E-Commerce Contexts

Auditors and accounting professionals face numerous challenges in conducting corporate audits within E-commerce contexts [17], [18]. The virtual nature of E-commerce transactions, coupled with the vast amount and speed of data generated, complicates assessing the accuracy and reliability of financial reporting [19]. Auditors must navigate complex digital ecosystems, reconcile diverse data sources, and mitigate risks like fraud, cybersecurity breaches, and regulatory non-compliance [20]. Agile audit methodologies are essential to adapt to the dynamic nature of E-commerce operations, requiring advanced data analytics tools, artificial intelligence, and machine learning algorithms for analyzing large datasets and detecting anomalies or irregularities [11]. Traditional audit approaches relying on manual techniques may fall short in evaluating financial integrity effectively within E-commerce environments.

2.4 The gap in Existing Research

While prior studies have explored various aspects of E-commerce, AIS, and corporate audits in isolation, there exists a notable gap in understanding the specific relationship and interdependencies among these variables. Limited research has been conducted to quantify the extent to which Technology-Based AIS adoption influences audit needs within E-commerce enterprises. A comprehensive analysis is warranted to elucidate the underlying factors shaping this relationship and to provide actionable insights for optimizing AIS functionalities to meet audit demands effectively.

3. METHODS

3.1 Research Design

This study adopts a quantitative research design to analyze the relationship between E-commerce businesses, Technology-Based AIS adoption, and corporate audit needs. The target population comprises E-commerce enterprises of varying sizes and industries, along with certified auditors or audit firms specializing in E-commerce audits. A stratified random sampling technique will be employed to ensure representation across different E-commerce sectors and audit practices. The sample size of 234 respondents was determined based on statistical power analysis to achieve sufficient precision and generalizability of results.

3.2 Data Collection

Primary data will be collected through structured online surveys administered to selected E-commerce firms and audit professionals. The survey questionnaire will be designed to capture information on E-commerce characteristics, AIS functionalities, audit requirements, and perceived challenges in financial reporting. The Likert scale ranging from 1 to 5 will be used to assess respondents' perceptions and attitudes towards various constructs. The survey instrument will be pre-tested for reliability and validity to ensure the accuracy and consistency of responses.

3.3 Data Analysis

Quantitative data analysis will involve Structural Equation Modeling (SEM) using Partial Least Squares (PLS) technique to examine the relationships between E-commerce, Technology-Based AIS adoption, and corporate audit needs. SEM-PLS is well-suited for analyzing complex relationships in research models with smaller sample sizes and non-normal data distributions, making it an appropriate choice for this study.

The analysis will proceed through several stages. First, the Measurement Model Assessment will involve Confirmatory Factor Analysis (CFA) to evaluate the reliability and validity of the measurement model, examining loadings, composite reliability, and average variance extracted (AVE) for each latent construct. Internal consistency reliability will be ensured through Cronbach's

alpha coefficients and composite reliability, while convergent and discriminant validity will be assessed via AVE and cross-loadings. Second, Structural Model Estimation will test hypothesized relationships between latent constructs, examining path coefficients and significance levels. Bootstrapping resampling will be employed to assess path coefficient significance and generate confidence intervals. Third, Model Fit and Evaluation will utilize indices like GFI, AGFI, NFI, and CFI to evaluate the overall fit, with RMSEA and SRMR assessing discrepancy. Finally, Mediation and Moderation Analysis will explore the mediating effects of Technology-

Based AIS adoption on E-commerce characteristics and corporate audit needs, and the moderation effects of contextual factors such as firm size, industry type, and technological infrastructure on key variable relationships.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

The survey collected responses from 234 participants, representing various sectors of the E-commerce industry and audit professionals. The demographic distribution is as follows:

Table 1. Demographic Characteristics of Respondents

Characteristic	Frequency	Percentage
Industry Sector		
Retail	105	44.9%
Technology	68	29.1%
Services	61	26.1%
Years of Experience		
Less than 5 years	82	35.0%
5-10 years	64	27.4%
More than 10 years	88	37.6%

The majority of respondents were from the retail sector (44.9%), followed by technology (29.1%) and services (26.1%). In terms of experience, 35.0% of respondents had less than 5 years of experience, 27.4% had 5-10 years, and 37.6% had more than 10 years of experience. These demographic characteristics provide a comprehensive overview of the sample composition, ensuring representation across different sectors and experience levels within the E-commerce industry and audit profession.

4.2 Measurement Model Assessment

The measurement model assessment involved confirmatory factor analysis (CFA) to evaluate the reliability and validity of the measurement model. Factor Loadings, all factor loadings exceeded the recommended threshold of 0.7, indicating strong convergent validity. The factor loadings ranged from 0.743 to 0.891 for E-commerce characteristics, 0.812 to 0.926 for Technology-Based AIS adoption, and 0.787 to 0.903 for corporate audit needs. Internal Consistency Reliability,

Cronbach's alpha coefficients, and composite reliability values were computed to assess internal consistency reliability. The values ranged from 0.813 to 0.927, exceeding the threshold of 0.7, indicating satisfactory reliability across all latent constructs.

Convergent Validity, the average variance extracted (AVE) values ranged from 0.601 to 0.789, surpassing the threshold of 0.5, which indicates acceptable convergent validity. This suggests that each latent construct accounts for a substantial amount of variance in its respective indicators. Discriminant Validity, Discriminant validity was assessed by examining the cross-loadings of items on their respective constructs. No significant issues were observed, indicating that each construct is distinct from the others.

4.3 Structural Model Estimation

The structural model estimation was conducted to test the hypothesized relationships between E-commerce characteristics, Technology-Based AIS adoption, and corporate audit needs. The

structural equation modeling (SEM) analysis revealed a significant positive relationship between E-commerce characteristics and Technology-Based AIS adoption ($\beta = 0.689$, $p < 0.001$). This indicates that as E-commerce characteristics, such as transaction volume and complexity, increase, there is a corresponding increase in the adoption of technology-driven AIS within E-commerce enterprises.

Similarly, a significant positive relationship was found between Technology-Based AIS adoption and corporate audit needs ($\beta = 0.712$, $p < 0.001$). This suggests that higher levels of Technology-Based AIS adoption are associated with increased readiness and effectiveness in meeting the audit requirements of E-commerce businesses.

The indirect effect of E-commerce characteristics on corporate audit needs through Technology-Based AIS adoption was significant ($\beta = 0.491$, $p < 0.001$). This indicates that a substantial portion of the influence of E-commerce characteristics on corporate audit needs is mediated by the adoption of technology-driven AIS. Overall, the results provide empirical support for the hypothesized relationships and highlight the importance of Technology-Based AIS adoption in bridging the gap between E-commerce operations and corporate audit needs. The findings suggest that firms with greater emphasis on E-commerce are more likely to adopt advanced AIS technologies, which, in turn, enhances their audit readiness and compliance.

4.4 Mediation and Moderation Analysis

Mediation and moderation analyses were conducted to further examine the relationships among E-commerce characteristics, Technology-Based AIS adoption, and corporate audit needs, as well as to explore the role of potential moderators in these relationships.

The mediation analysis aimed to assess the mediating role of Technology-Based AIS adoption in the relationship between E-commerce characteristics and corporate audit needs. The results revealed a

significant indirect effect of E-commerce characteristics on corporate audit needs through Technology-Based AIS adoption ($\beta = 0.491$, $p < 0.001$). This suggests that a substantial portion of the influence of E-commerce characteristics on corporate audit needs is mediated by the adoption of technology-driven AIS. Thus, firms with higher levels of E-commerce activity are more likely to adopt advanced AIS technologies, leading to enhanced audit readiness and effectiveness.

Moderation analysis was conducted to investigate the moderating effects of firm size and industry type on the relationships among E-commerce characteristics, Technology-Based AIS adoption, and corporate audit needs. The results revealed significant moderation effects, indicating that firm size and industry type influence the strength and direction of these relationships. Larger firms exhibited stronger associations between E-commerce characteristics, Technology-Based AIS adoption, and corporate audit needs, suggesting that larger organizations have greater resources and capabilities to invest in advanced AIS technologies and exhibit higher levels of audit preparedness. Additionally, firms operating in technology-intensive industries showed stronger relationships between E-commerce characteristics, Technology-Based AIS adoption, and corporate audit needs, indicating that industry dynamics and technological infrastructure play a significant role in shaping technology adoption decisions and audit requirements within E-commerce environments.

4.5 Model Fit and Evaluation

The model fit and evaluation aim to assess the adequacy of the structural model in explaining the relationships among the latent constructs of E-commerce characteristics, Technology-Based AIS adoption, and corporate audit needs. Several goodness-of-fit indices were utilized for this purpose. The Goodness-of-Fit Index (GFI) revealed that 92.8% of the variance and covariance in the observed data are accounted for by the structural model, indicating a good fit. Similarly, the Adjusted Goodness-of-Fit Index

(AGFI) remained high at 90.2%, supporting the model's goodness of fit after adjusting for degrees of freedom. The Normed Fit Index (NFI) and Comparative Fit Index (CFI) both showed favorable comparisons to null models, with 94.1% and 95.4% of the fit achieved by the proposed model, respectively. Additionally, the Root Mean Square Error of Approximation (RMSEA) fell below the threshold of 0.08, indicating an acceptable fit, while the Standardized Root Mean Square Residual (SRMR) suggested a good fit between observed and predicted variables with a value of 0.054. Overall, these indices collectively indicate that the structural model provides a satisfactory explanation for the relationships among the latent constructs under investigation.

DISCUSSION

The results of the study shed light on the intricate relationships between E-commerce characteristics, Technology-Based AIS adoption, and corporate audit needs, providing valuable insights into the dynamics of financial management and audit readiness within E-commerce enterprises.

E-commerce Characteristics and Technology-Based AIS Adoption

The significant positive relationship between E-commerce characteristics and Technology-Based AIS adoption highlights the pivotal role of technological innovation in meeting the evolving demands of E-commerce operations. Companies engaged in extensive E-commerce activities are increasingly leveraging advanced Artificial Intelligence (AI) technologies to optimize financial processes, ensure data accuracy, and improve decision-making competencies [14], [21], [22]. The integration of AI resources, both technological and human, in E-commerce platforms plays an important role in enhancing channel power by acquiring market-based assets such as relational and intellectual assets [23]. This strategic adoption of AI in E-commerce is in line with the broader trend of organizations using AI to gain competitive advantage, improve efficiency, and drive innovation in business strategies and decision-making processes [24]. This study underscores the transformative

potential of AI in revolutionizing business strategies and underscores the importance of addressing challenges such as ethical considerations and data privacy to ensure the responsible adoption of AI in E-commerce and other industries.

Technology-Based AIS Adoption and Corporate Audit Needs

Similarly, the significant positive relationship between Technology-Based AIS adoption and corporate audit needs underscores the importance of technological readiness in facilitating effective audit processes within E-commerce enterprises. Advanced AIS technologies, such as data analytics, artificial intelligence, robotic process automation, and blockchain, play an important role in improving internal controls, ensuring data integrity, and providing timely financial information to auditors [25], [26]. These technologies enable greater efficiency, better risk assessment, and more effective processes within organizations, leading to better decision-making and analysis [27]. However, the complexity of these technologies poses challenges for IT auditors, requiring a deep understanding of blockchain, AI, and cloud computing to ensure audits [28]. In addition, the use of anticipatory thinking and a flexible model risk audit framework can help organizations prepare for responsible AI deployment, addressing risks such as model robustness, security, bias, and privacy [29]. By critically engaging with these technological advancements, organizations can improve audit efficiency, reduce compliance risks, and demonstrate adherence to regulatory requirements, thereby fostering trust and credibility among stakeholders.

Mediating Role of Technology-Based AIS Adoption

The mediation analysis revealed that Technology-Based AIS adoption partially mediates the relationship between E-commerce characteristics and corporate audit needs. This suggests that the adoption of advanced AIS technologies serves as a critical mechanism through which E-commerce firms address the audit requirements arising from their operational complexity and

transactional volume. By harnessing the capabilities of technology-driven AIS, organizations can enhance audit readiness, improve data transparency, and mitigate the challenges associated with auditing in digital environments.

Moderating Effects of Firm Size and Industry Type

The moderation analysis highlighted the influence of firm size and industry type on the relationships among key variables. Larger firms and those operating in technology-intensive industries exhibited stronger associations between E-commerce characteristics, Technology-Based AIS adoption, and corporate audit needs. This underscores the importance of organizational context in shaping technology adoption decisions and audit requirements within E-commerce environments. Larger organizations with greater resources and capabilities are better positioned to invest in advanced AIS technologies and demonstrate higher levels of audit preparedness, while industry dynamics and technological infrastructure play a significant role in driving technology adoption and audit practices.

Implications and Future Directions

The findings have practical implications for E-commerce firms, audit professionals, and policymakers seeking to enhance financial transparency, governance, and compliance in the digital age. By embracing innovative technologies and adapting audit methodologies to the unique challenges of E-commerce environments, organizations can strengthen their competitive position, mitigate risks, and

foster trust among stakeholders in an increasingly interconnected global marketplace. Future research could explore additional factors influencing Technology-Based AIS adoption and corporate audit practices, as well as investigate the long-term impact of technological innovation on financial management and audit effectiveness within E-commerce enterprises.

5. CONCLUSION

In conclusion, this study provides empirical insights into the intricate dynamics between E-commerce operations, Technology-Based AIS adoption, and corporate audit needs. The results highlight the critical role of technological innovation in addressing the evolving demands of E-commerce transactions and enhancing audit readiness within organizations. By adopting advanced AIS technologies, E-commerce firms can streamline financial processes, improve data accuracy, and demonstrate compliance with regulatory requirements, thereby fostering trust and credibility among stakeholders. Moreover, the findings underscore the significance of organizational context, with firm size and industry type influencing the strength and direction of relationships among key variables. Overall, the study contributes to the growing body of literature on technology adoption and audit practices in the digital era, offering practical implications for E-commerce firms, audit professionals, and policymakers seeking to navigate the challenges and opportunities of the digital marketplace.

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