Moderating Effects of Accounting Technology on Audit Quality: Empirical Evidence from Southwest, Nigeria

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***Abstract*—There exist several studies on manual accounting system audit quality (AQ) while there are very few studies of what could be the influence of technology. The importance of the effect of accounting technology (AT) is pronounced in its ability to enhance the credibility of audit reports. Therefore, the main goal of this study is to ascertain how AT affects AQ in southwestern Nigeria. A standardized questionnaire with a 4-point Likert scale was used in this exploratory investigation. There were ten constructs in the sample: six dependent variables and four explanatory variables. With a return rate of 76% (389), 514 questionnaires were distributed, both physically and virtually. Of these, 362 were deemed valid for the study and were analyzed using a regression model to test hypotheses 1 and 2. Hypothesis 3 was analyzed using partial least squares. The findings demonstrate that AT significantly improves both the technical and service qualities of audits. It was discovered that AT has a large, favorable, and significant combined influence on AQ. In light of this, it is advised that standard-setting boards establish the rules required to ensure AQ in the current era of AT and that medium-sized businesses adopt AT into their accounting system to enhance the AQ of their operations. Further research with a broader focus on these different areas is required.**

***Keywords*—Accounting information systems, Accounting technology, Audit quality, AuditQual, Service quality, Technical quality.**

I. Introduction

Auditing in the business world is constantly evolving, with professionals developing procedures to meet the standards for both statutory and non-audit services. The application of information technology (IT) has become essential in various business processes, particularly accounting systems. IT tools are used to maintain bookkeeping, accounting records, taxation, auditing, and consultancy (Imenel and Imhanzenobe, 2020). These tools are particularly useful for payroll receivables, payables, and inventory management. The integration of IT into accounting systems has revolutionized the way businesses operate and manage their financial records.

Computer-assisted audit techniques (CAATs), particularly general audit software, have revolutionized audit practices by enabling interactions with client accounting systems. According to Serpeninova *et al*. (2020), these techniques are effective in gaining and processing audit evidence and enhancing audit quality (AQ), (Alhabsi, 2017) and can be significantly improved when deployed correctly and by those with the right training according to Financial Reporting Council (FRC, 2020).

AQ can be regarded as the value of audit reports to end-users. It is the perception of capital markets and others that rely on assurance reports for decision-making. The reactions of informed market participants suggest a value relevant to the audit report. A positive and general acceptability of a report indicates that it is of high quality, and the reverse is true when the market is skeptical of an audit report. Therefore, stakeholders determine the relative worth of audit reports. Potential investors and other market participants are concerned about the quality of their audit reports. They expect that an unqualified report indicates that financial statements are of quality, whereas the reverse is true for a qualified audit report.

Therefore, audit reports must pass quality tests to inspire confidence. According to the Canadian Public Accountability Board (CPAB) (2017), an independent auditor's report is intended to earn the confidence of not only investors but also all users of accounting information. Investors for decision-

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making do not rely solely on financial information; in fact, they rely more on information outside of those provided in published reports. However, the report is the major document through which management provides accounts of stewardship to stakeholders. In addition, CPAB (2017) asserts that transformational information, which is also subject to examination by external auditors, drives capital markets; thus, AQ remains relevant to capital market operators.

AQ, both in practice and the literature, has not been widely defined. This is evident in the debate between seasoned professionals defining AQ during the Standing Advisory Group meeting of the Public Company Accounting Oversight Board (PCAOB, 2013), Bedard *et al*. (2010: p. C12) reported that this group could not agree on a common definition. However, authors suggested differing definitions, DeAngelo (1981) defined it as the market assessed joint probability that a given will both discover and report a breach in a client's accounting system. Carp and Istrate (2021) define it as the extent to which the market recognizes the auditor's ability to detect and report breaches in the accounting and financial reporting system of the client. Abozaid *et al*. (2020) argue that the effectiveness of AQ in improving the value of financial statements is pronounced in an automated accounting system. They also argue that AQ is seen as greater assurance that requires more audit work.

As a result, there is no universally agreed upon definition of AQ due to disagreements among seasonal experts over what constitutes AQ and what its signs are (Chersan, 2019, p. 94) in which the value of financial statements may be enhanced by AQ more effectively. However, attaining better AQ requires greater assurance and work. When it comes to defining AQ or quantifying AQ, the body of the existing literature falls short of providing a consensus definition. Among the authors' recommended yardsticks is firm size: since a large audit company can perform a comprehensive audit more easily than a small one, thanks to its greater technology and human resources, audit firm size is considered one of the major determinants.

(DeAngelo, 1981). Other factors that have been used as measures of AQ include audit firm factors (Schroeder *et al*., 1986) audit team and firm experience (Annelin, 2019, p. 1; Aziza and Angus, 2019; Hussein *et al*., 2020, p. 768) audit contract type, audit fees, non-audit services (Raak and Thürheimer 2016, p. 355) and audit tenure/ rotation. (Akinyomi and Abimbola, 2022, p. 8; Olabisi *et al*., 2020, p. 184).

Another effort by Rajgopal *et al*. (2021, p. 588) first classified AQ indicators into engagement levels, which included audit hours, training hours, personnel assignments, audit feed, auditor partner tenure, tailoring of audit tests to reflect client risk, audit budgeting, and individual specialization. The second classification is firm-level indicators, which comprise the size of the audit firm, its independence, and the audit firm's compensation plan. This classification is an aggregation of previously suggested indicators of AQ but simplifies the measurement of AQ, which can be employed under a specific demand.

A comprehensive study conducted to examine most indicators of AQ established that all previously acclaimed indicators do not truly represent AQ, and it was suggested that a truly representative of the determinant should be established.

Duff's AuditQual classification is a broad approach for determining the factors in auditing. It categorizes factors into technical and service qualities using nine sub elements. (Duff 2004, p. 12). In the second stage, four higher-order quality factors were identified: competence, independence, relationships, and service quality. Competence includes reputation, capacity, assurance, independence, experience, empathy, and responsiveness (Duff, 2009).

Raak and Thurheimer (2016, p. 3550) claimed that Rajgopal *et al*. (2015) criticized traditional factors for measuring AQ. Recent studies suggest that indicators should be chosen based on the AQ. The AuditQual model reveals that independence, technical skills, and relationships among partners, firms, and clients are proxies for AQ. This study focuses on obtaining opinions from quality inspectors on a wider variety of AQ elements, with implications for audit professionals and authorities.

Relatively few extant studies have considered the moderating effect of the employment of accounting technology (AT) on the performance of the accounting functions of entities on the technical and service quality of audits. In addition, the few existing studies were found mostly in Europe and Asian countries; hence, it is necessary to determine the same in Africa, especially in Nigeria and these few in Nigeria have different focuses despite the fact of attention on AQ. Therefore, this study explores a new approach to studying AQ in this era of IT.

AuditQual, a 2009 revised behavioral indicator, was adopted for the present study because of its suitability for AQ in automated accounting systems. Small and large auditing firms can use software and modern analytical data. This study uses primary data to explore the impact of accounting automation on AQ in Southwest Nigeria. Few studies on the impact of AQ on AT are available and they primarily rely on secondary data. This study uses primary data to investigate the effects of accounting automation in South-west Nigeria.

This study provides answers to the following questions:

RQ1: How does AT affect the technical quality of quality?
RQ 2: What is the effect of AT on audit service quality?
RQ 3: In what significant way does AT affect AQ?

Consequently, we empirically established the effect of AT on AQ. Therefore, this study hypothesizes the following.

H01: The application of AT has no significant effect on technical quality of audit
H02: AT has no significant effect on audit service quality
H03: AT has no significant moderating effect on AQ.

II. Literature Review

Market participants and stakeholders expect credible financial statements from management. Audits provide assurance for these statements, ensuring that they are of

quality. This is based on credibility theory (Hayes *et al*., 2021), which adds integrity to financial reporting (Tjeng and Nopianti 2021, p. 135). To address this issue, Limperg (1926) developed a theory of inspired confidence. Internal accountants may lack credibility to guarantee prepared statements, and this position was buttressed by Mansaja, while Hayes *et al*. (2021, p. 32) added the following:

> "*The community requests an objective view on the managers' stewardship Accounts, but it seems unreasonable to expect that of someone who is working for that management and is, organizationally speaking, required to follow that manager's instruction*" *and* yet to provide objective assessment of the management.

Therefore, these two theories, lending credibility and inspired confidence, are the underlying theories of this study. All sub-constructs of both the technical and service qualities of audits when severally and jointly managed in an automated accounting system environment should lead to higher AQ, which is the major ingredient in securing users' confidence in the credibility of audited financial statements (ASIC, 2022).

The alarming collapse and mergers of Nigerian deposit money banks have led regulators to consider improving AQ. Ekpeni *et al*. (2021) found that accounting information systems significantly affect banks' internal AQ. This finding highlights the need for technological innovation to enhance the AQ in the banking industry. The study was descriptive and inferential and involved 12 banks listed on the Nigerian Exchange Group (hereafter referred to as). The study has the same focus and employed primary data as the present study; however, the focus was not on the effect of the application of AT. Moreover, scope limits internal AQ in the banking industry, whereas the present study is concerned with the auditing industry as a whole.

According to Tjeng and Nopianti (2021), auditors' technical skills have a major beneficial impact on the quality of financial statement information. This study considers the impact of IT on auditor service abilities and the effect of attendance on AQ. It is based on data from public accounting firms in Banten. The present research and this one have similar objectives; however, the latter does not address the influence of AT on auditors' technical abilities.

Ghadhab *et al*. (2019) conducted a study that seeks to thoroughly examine the elements that influence how well external auditors do their jobs for Iraqi audit firms and businesses. This study emphasizes the significance of auditor performance quality. All respondents were in accounting and auditing functions to obtain accurate results that represented the audit work performed by the audit offices in Iraq. The study came to significant conclusions with the most crucial is that audit offices must adhere to the quality control system (peer review) and maintain total independence from the client, increasing the confidence that all parties dealing with the economic unit have in the auditor's report.

Kermani *et al*. (2016) evaluate the impact of computer use on AQ in small, medium, and large firms. The results showed that audit software was less effective in small enterprises but adequate in medium and large firms. The hypotheses were tested using Pearson's correlation coefficient. This study finds a direct relationship between audited firm size and computer audit effectiveness. This study did not emphasize the implications of AT on AQ and failed to focus on the two classes of AQ.

Rajgopal *et al*. (2021) measured AQ and used 141 AAERs and 153 securities class action cases spanning the violation years 1978–2016, of which 45 specific charges on audit flaws based on GAAS were documented. These accusations were then used to support widely utilized substitutes for AQ. It was discovered that restatements reliably predicted each of the top six most often-identified audit flaws out of all AQ proxies. Overall, the findings imply that in settings in which researchers are interested, the specific audit flaws predicted to matter in the examined environment determine the predictive value of AQ proxies.

Sulaiman (2018) examined the perceptions of quality inspectors in a UK AQ review regarding AQ. The survey identified low client service quality and high audit process performance as the key attributes. Internal factors, such as behavioral, technological, and relational factors, impact audit engagements, potentially causing variations in AQ. Most inspectors mentioned issues, such as sufficient evidence, paperwork, and external auditors' lack of dispute. This study expands previous research by examining a wider range of AQ characteristics and features that impact audit professionals and authorities.

Ababneh and Alrabei (2021) examined the relationship between AQ, accounting information quality, and the moderating effect of IT in Jordan. This study involved 190 questionnaires, with 152 responses. The results show that IT moderates the relationship between AQ and accounting information accuracy including audit firm size, fees, and compliance with international standards. Attention is also not paid to the two classifications of AQ, but instead to AT, as in the present study, it accounted for information accuracy in their study.

Aronmwan *et al*. (2013) assessed the link between audit firm reputation and AQ using a sample of 35 listed businesses active on the Nigerian Stock Exchange's trading floor. The study employed ex-post facto research designed as data were secondarily sourced from selected firms' published accounts and subjected to an ordinary least squares model estimation approach. The results demonstrate a substantial positive association between AQ and audit-firm reputation. The study recommends that businesses use the services of audit organizations with a solid track record of reputation.

Duff (2009) considers AQ in the UK market from 2002 to 2005, focusing on three stakeholder groups: investors, auditees, and auditors. The findings reveal that competence, independence, connection, and service quality define AQ. However, the mean scores for technical audit elements decreased from 2002 to 2005, whereas those for service attributes remained unchanged. This study did not consider the impact of automated accounting systems on AQ.

Skinner *et al*. (2012) investigated AQ and auditor reputation in Japan, focusing on ChuoAoyama's unsuccessful audit of Kanebo, a major cosmetics company. This study found that auditors' reputations significantly impact AQ,

especially in litigious environments in which litigation is minimal.

A. Measurement of Variables and Hypotheses Development

According to Hamlen *et al*. (2010), and cited by Jasim and Raewf (2020), AT is described as a treaty involving the operation of data storage, processing, dissemination, and exploitation by computers and telecommunications systems. The application of AT to the management of the study's independent variables has been discussed earlier in terms of automated accounting systems and audit fees (Akinola and Olagunju, 2023). Accounting software is used to maintain and manage all aspects of accounting and bookkeeping. Business size and cost are no longer barriers, as small businesses can use off-the-shelf software for their accounting and bookkeeping functions. The application of AT makes auditing using computers compulsory for audit firms.

Most audit firm clients are managed using accounting software, making their auditing amenable to CAAT applications. Emerging economies, such as Nigeria, are no longer limited in their usage (application of AT). Sina *et al*. (2021) confirmed that:

> "*In the 21st century from bank to insurance, multinational companies to government offices have increased thousands of times their profitability, productivity, sustainability, and also market expansion through the successful uses of 'and this assertion is applicable in Bangladesh'*. p85."

In addition, Ababneh and Alrabei (2021) reported that accounting information systems have become an important tool for improving the efficiency of companies in Jordan as they embrace technology for accounting functions. However, this study specifically identifies four accounting functions (receivables, payable, inventory, and payroll) where the use of accounting automation is of paramount importance. Managing these sub-accounting functions can adequately reflect the effect of AT applications on other accounting functions and determine the moderating effect of automation on all aspects of the technical and service qualities of audits.

Duff (2009) proposes a divergence from conventional audit-quality metrics. The two areas of AQ that this study divides are technical and service qualities, which are part of total AQ. According to recent opinions, academic research has added conversations regarding AQ. It primarily uses publicly available data to quantify and infer AQ (Raak and Thurheimer, 2016). However, they contend that these publicly accessible AQ metrics cannot accurately reflect the true AQ. Furthermore, Dunakhir (2016) highlighted that traditional factors for AQ have been the subject of criticism over the years, suggesting that indicators should be selected based on the purpose of AQ, which is meant for service.

Therefore, this study was motivated to adopt AuditQual, as suggested by Duff (2009). AuditQual examined AQ from two perspectives, technical and service qualities, using indicators to measure them. This study adopted reputation, capability (capacity), expertise, and experience for technical quality, whereas responsiveness and empathy were considered for service quality. These indicators are appropriate for measuring AQ in the modern age.

B. Technical Quality of Audit

Tjen and Nopianti (2021, p. 132) cited Hussein and Hanefah (2013) to have defined technical quality as the "ability of the auditor to understand the technical steps that must be taken during the implementation of a series of audit processes." This is the expectation that auditors possess the basic requirement to function with and guarantee the effective input process of auditing. Auditors' technical abilities depend on their competence, capability, reputation, and expertise.

Reputation

This is the corporate image built over time by the firm (Massoudi *et al*., 2023). This is the acknowledgment of clients and market participants of audit firms, who have consistently provided reliable assurance services over the years. Audit firms of repute endeavor to jealously protect their reputation, and this will spur such firms to allow best practices in their audit process and provide higher quality services (Blum *et al*., 2022). Skinner *et al*. (2012) claimed that reputation effects are sufficient to ensure quality and that auditors' legal liability for corporate failures should be limited. Author Andersen (an audit firm and one of the Big 8 of that era) ceased to be a concern as a result of the loss of reputation out of the failure of Enron in the US, while ChouAoyama (an affiliate of PwC in Japan) could not survive failed audits of Kaneba, a Japanese cosmetics company for loss of reputation (Aziza and Agus, 2019).

Capability

Duff (2004) considers this to be the competence of an audit team. In this technology-driven dispensation, the audit team is expected to have a more basic knowledge of accounting and auditing technology. Their ability to interact with their clients' operating systems is unclear. Every team member should possess adequate knowledge of the various accounting software programs. This guarantees a positive moderating effect on an auditor's technical quality. Tjeng and Nopianti (2021, p. 133) identified capability as a way to provide quality audit jobs and produce reports that meet the expectations of market participants and stakeholders.

Expertise

Adequate knowledge of the legal framework of operations in the client industry by Pinatik (2021, p. 56) regards it as an audit firm with clients in the same industry. When an audit firm retains the engagement of clients in the same industry, it tends to use the same accounting software to seamlessly interact with the accounting information system, thereby enhancing the audit process.

Experience

This study considers this as the number of years that an audit firm and staff are involved in the assurance function and the duration of exposure to the usage of CAATs. Duff (2004, p. 78), with no specific attention to the type of accounting system, conceptualized experience as managers of audit firms involved in audit engagement for 2 or more

years (Aziza and Agus, 2019). The benefits of the application of AT in terms of efficiency and effectiveness will enhance assurance services, which will also promote the indicators of the technical quality of audits. Hence, we hypothesize that

H01: The application of AT has no moderating effect on an audit's technical quality.

C. Service Quality of Audit

(Duff, 2004, p. 29) defined service quality as "the extent of discrepancy between customers' expectations or desired and their perceptions" (20 In other words, AQ is attained when "service quality" impressions are either met or exceeded and vice versa. Responsiveness and empathy are thought to be signs of high-quality services.

Responsiveness

This is an audit firm's willingness to provide detailed cost information to clients and support clients in understanding every segment of the audit process and report. It involves every member of the engagement team in the provision of clarification sought by an authorized member of the client's staff/management. The application of CAATs enhances the prompt responsiveness of all audit team members. Two-way communication can be virtually promoted through zoom, email, etc.

Empathy

Engagement partners are expected to take the initiative and have a positive impact on each engagement by helping to make substantive and compliance tests easier to complete and, ultimately, to provide audit reports on time. At every level of the audit process, accounting IT provides smooth and instantaneous communication between the engagement and client personnel. This will ultimately improve the quality of audit reports. Consequently, it is postulated that

H02: The application of AT has no moderating effect on service quality.

Market participants' ultimate concern is the moderating effect of the application of AT as a driver of technical and service factors on AQ. Hence, this study provides empirical evidence and proposes the following hypotheses:

H03: Application of AT has no moderating effect on AQ.

III. Methodology

This study leveraged a descriptive-cross-sectional (and exploratory) design with an emphasis on qualitative and quantitative approaches. This study examines the moderating effect of AT on both technical and service quality and its overall influence on AQ. The study population comprised 21,559 financial members of the Institute of Chartered Accountants of Nigeria (ICAN) as of May 31, 2022 (ICAN, 2022), and a minimum sample size of 393 was determined using Yamane's formula.

However, between June and December 2022, 514 copies of a 4-point Likert scale questionnaire were given to accountants working in the top four private practices as well as mid-tier accounting companies through email addresses and LinkedIn. The questionnaire was also disseminated using Google Forms. Of the 389 completed and returned copies, 362 copies, or 70% of the dispersed copies. First, a regression model was used to analyze the valid copies of the questionnaire at a 95% confidence level for the first two hypotheses, using the partial least square-structured equation method (PLS-SEM), and the third hypothesis, which establishes the joint effect, was examined for multivariate variables, such as those involved in determining the combined effect of the independent factors on the dependent variable, PLS-SEM is most suitable.

The constructs for the independent and dependent variables are included in Table I along with several sources from which they were developed for this investigation. The study instrument was built on these constructs and underwent reliability and validity testing. The results of these tests are listed in Table II.

The reliability of the scale of this study was verified with the of assistance Cronbach's alpha and Table II provides that the coefficient varies between 0.779 and 0.929, which is above the threshold of 0.7, for the ten (10) constructs (application of AT, audit reputation, audit capability, audit expertise, audit experience – for technical quality, and audit responsiveness and audit empathy for service quality). This finding suggests that the study instrument was reliable. Similarly, the validity of the instrument is established with load factor, which reveals items of less value to the study and such were therefore isolated for further analysis while the

TABLE I
Summary for Measurement of Variables

Variables	No of Items	Sources
Dependent (AQ)		
Technical audit (TECHQLY)		Duff (2009); Tjeng and Nopianti (2021); Pinatik (2021)
(i) Reputation	04	Skinner *et al*. (2012); Blum *et al*. (2022); Aronmwan *et al*. (2013); Mat *et al*. (2021); Tonekabonia *et al*. (2022)
(ii) Capability	04	Tjeng and Nopianti (2021); Pinatik (2021); Abaneh and Alrabel (2021); Sulaiman *et al*. (2019)
(iii) Expertise	05	Pinatik (2021); Imansari *et al*. (2016); Aobdia (2019)
(iv) Experience	04	Tjeng and Nopianti (2021); Imansari *et al*. (2017); Rajgopal *et al*. (2020); Duff (2009)
Service quality (SERVQLY)		Duff (2009); Butcher *et al*. (2013)
(i) Responsiveness	05	Duff (2009)
(ii) Empathy	04	Duff (2009); Zhao *et al*. (2022)
Independent: (AT)		
Receivables	07	Alaoma *et al*. (2020); Andreassen (2020); Dirie and Ramli (2022); Oyimba and Ugwu (2023); Pargmann *et al*. (2023); Schibsted (2023)
Payables	06	Alaoma *et al*. (2020); Dirie and Ramli (2022); Nkwasibwe *et al*. (2023); Pargmann *et al*. (2023); Singh *et al*. (2020)
Inventory	06	Wei *et al*. (2023); Dirie and Ramli (2022); Pargmann *et al*. (2023)
Payroll	06	Tuan *et al*. (2023); Ahmed *et al*. (2023); Palladan and Palladan (2018); Pargmann *et al*. (2023); Ojedele (2023); Putra *et al*. (2023)

Sources: Authors' Computation, (2022). AQ: Audit quality, AT: Accounting technology

TABLE II
Reliability and Validity Statistics

Variables	Items	Factor Loading	Cronbach alpha	Composite reliability	AVE
Application of automated accounting system	Item 1	0.858	0.779	0.916	0.785
	Item 2	0.947			
	Item 3	0.849			
Technical quality: Reputation	Item 1	1.167	0.922	0.910	0.786
	Item 3	0.711			
	Item 4	0.837			
Technical quality: Capability	Item 1	0.627	0.919	0.795	0.492
	Item 2	0.820			
Technical quality: Expertise	Item 1	0.724	0.928	0.692	0.533
	Item 3	0.572			
Technical quality: Experience	Item 1	0.724	0.814	0.799	0.450
	Item 3	0.886			
Service quality: Responsiveness	Item 2	0.827	0.845	0.632	0.475
	Item 3	0.516			
	Item 4	0.669			
Service quality: Empathy	Item 1	0.556	0.929	0.735	0.489
	Item 2	0.642			
	Item 3	0.864			

Source: Authors' Computation (2022). AVE: Average variance extract

result of average variance extract (AVE) that ranges between 0.5 and 0.8 confirms discriminant validity of the instrument to a satisfactory extent.

Models Specification for Moderating Effect of Application of AT on AQ

$$AUDQLY = f(AAT)$$

Where:

AUDQLY = TECHQLY + SERVQUALY

AAT = Application of Accounting Technology

`Arisen from the above function is the full model applied for this which is stated as follows:

$$\text{Model One: } QLYTECH = \beta_0 + \beta_1 AATREC + \beta_2 AATPAY + \beta_3 AATIN + \beta_4 AATROLL + ei$$

$$\text{Model Two: } QLYSERV = \beta_0 + \beta_1 AATREC + \beta_2 AATPAY + \beta_3 AATINV + \beta_4 AATROLL + e_i$$

$$\text{Model Three: } AUDQULY = \beta_0 + \beta_1 AATREC + \beta_2 AATPAY + \beta_3 AATINV + \beta_4 AATROLL + ei$$

Where: β_0 = Estimate of the y-intercept

β1 = Slope of the regression line

TECHQLY = Technical Quality

SERVQLY = Service Quality

AATREC = Application of accounting technology to Receivables

AATPAY = Application of accounting technology to Payables

AATINV = Application of accounting technology to Inventory

AATROLL = Application of accounting technology to Payroll

ei = Error term

IV. Results and Discussion

A. descriptive Analysis

Table III shows that, under the category staff, 389 questionnaires were correctly completed and returned both physically and virtually through the email/Whatsapp platform (Google form); 362 of these were found to have been filled out by respondents, accounting for 95.5% of those who directly participated in the external audit function, while 27 of the total (4.5%) were completed and returned by those who were not in the audit function and who were not directly involved in audit engagement; as a result, they were excluded. Approximately 41 (11.3%)

TABLE III
Functions, Experience, and Qualification of Respondents

Authors' Computation (2023)			
Category of Staff	Audit Staff	Frequency	Percentage
Class of Respondents	Audit Staff	362	93.1
	Others	27	6.9
		389	100
Audit Staff	Junior	44	12.2
	Associate	64	17.7
	Semi-Senior Associate	50	13.8
	Experienced/Senior	102	28.2
	Assistant Manager	33	9.1
	Manager	14	3.9
	Consultant	11	3.0
	Associate Director	3	0.8
	Partner	22	6.1
	Principal Partner	11	3.0
	Managing Partner	8	2.2
		362	100
Highest Educational Qualification	ND	20	5.5
	HND/B.Sc.	262	72.4
	MBA/M.Sc.	67	18.5
	Ph.D.	13	3.6
		362	100
Professional Qualification	ATS	12	3.3
	ICAN	267	73.8
	ANAN	17	4.7
	ICAN in View	61	16.9
	ACCA	5	1.4
		362	100
Working Experience	Less than 3 Years	60	16.6
	3–10 Years	168	46.4
	11–20 Years	80	22.1
	21 Years and above	54	14.9
		362	100

of the 362 respondents who provided valid replies were partners, main partners, or managing partners who planned audits, took important decisions, assessed the evidence, or dealt with the management of their customers. Their participation in this study bolsters both face validity and content validity. Furthermore, 163 respondents, or 45% of the total, are middle-level managers (experienced/senior; assistant manager; managers, directors, and consultants), who are the actual players in all audit engagements. Their expressed opinions have a significant impact on how the audit process is operationalized. Finally, junior, associate, and semi-senior associates constitute (45%) 163. Overall, the mixes of respondents on each stratification appear reasonable enough for the purpose of this study, as the study obtained a balanced opinion of relevant professionals.

Regarding respondents' academic and professional qualifications, 342 (94.5%) were graduates and 289 (79.8%) were chartered accountants. This implies that the respondent possesses the requisite for understanding the language and importance of the questions.

In terms of engagement/field experience, 134 (37%) had been in the audit industry for over ten years, whereas 168 (46%) had been in the industry for within three (3) and ten (10) years whereas 60 (17%) had been in the industry for less than three (3) years, respectively. This result confirms that the majority of respondents possess the necessary field experience and are in a better position to appreciate the importance and processes that can determine the quality of audit reports.

Table IV shows the overall mean value of 3.23, capability with a mean value of 3.12, expertise with a mean value of 3.20, and experience with a mean value of 3.09. This indicates that the respondents agreed that the application of AT had a moderating effect on the chosen proxies for the technical and service quality of audits. In addition, the respondents were of the view that the application of AT to execute accounting activities has a moderating effect on the technical (3.16) and service (3.13) qualities of audit engagement.

Table V shows the respondents' accounting packages/ software usage. Based on the above table, 73.2% used Sage 50 Cloud, 8.3% used other applications not mentioned, and 13.3% used QuickBooks. A total of 4.2% used Wave Financial and Xero Accounting.

TABLE IV
Descriptive Analysis: Research Questions

Questions	Means	Level of consensus
Technical Quality		
Reputation	3.23	Agreed
Capability	3.12	Agreed
Expertise	3.20	Agreed
Experience	3.09	Agreed
Weighted Average:	3.16	Agreed
Service Quality		
Responsiveness	3.01	Agreed
Empathy	3.25	Agreed
Weighted Average:	3.13	Agreed

Authors' Computation (2023)

In Southwest Nigeria, Sage 50 is the most frequently used accounting software, and 73% of respondents submitted that their clients use it. QuickBooks is the second most popular accounting package, with 13% of the respondents confirming that their clients use it (Akinola and Olagunju, 2023). This outcome was consistent with Itang's (2018) finding that the most used accounting software in Nigeria is Sage 50 Cloud. The aforementioned result further confirms that accounting functions are managed in South-west Nigeria through the use of accounting programs.

B. Test of Hypotheses

Hypothesis 1: The application of AT has no moderating effect on audit technical quality.

Model 1: $QLYTECH = \beta_0 + \beta_1 REC + \beta_2 PAY + \beta_3 INV + \beta_4 ROLL + ei$

Multicollinearity and autocorrelation between the technical quality indicators are not present, as Table VI demonstrates. The findings indicate that the moderating influence of AT applications accounts for 55.4% of the variation in audit-technical quality. However, 44.6% of this difference could be attributed to other causes. The application of AT to Account Receivables, accounts payable, Payroll, and Inventory (*t*-statistics value and *P*-value of 3.299, 0.001, 5.786, 0.000, 14.279, 0.000, and 6.769, 0.000, respectively) has a positive significant effect on the technical quality of the audit. The

TABLE V
Accounting Packages/Software in Use

Questions	Frequencies (Count)	Percentage
Quick Book	48	13.26
Sage 50 Cloud	265	73.20
Wave Financial	14	3.87
Xero Accounting	4	1.10
Zoho Book	1	0.28
Others	30	8.29
Total	362	100

Source: Akinola and Olagunju (2023)

TABLE VI
Application of Accounting Technology and Technical Quality of Audit

Variable	Coefficient	Std. error	*P*-value	*t*-statistics	Multicollinearity statistics	
					Tolerance	VIF
Constant	0.501	0.238	0.036	2.108		
Receivables (REC)	0.117	0.031	0.001	3.299	0.992	1.008
Payables (PAY)	0.323	0.063	0.000	5.786	0.401	2.491
Inventory (INV)	0.290	0.050	0.000	14.279	0.679	1.472
Payroll (ROLL)	0.781	0.058	0.000	6.769	0.417	2.396
R	0.744					
R^2	0.554					
Adjusted R^2	0.549					
S.E. of regression	0.85513					
Sum Square resid.	261.056					
F-stat.	110.711					
Prob.	0.000					
Durbin-Watson	2.130					

Source: Authors' Computation (2023), VIF: variance inflation factor

model with (F-stat [4, 357] = 110.71; P = 0.000) was sufficient to determine the moderating effect. This finding supports Tjeng and Nopianti (2021, p. 129), who found that the technical ability of an audit has a positive effect on the quality of financial statement information in Banten.

This finding implies that the application of technology for the management of accounting functions will enhance the technical quality of audits and that AT will have a significant and positive effect on the technical quality of audits.

Hypothesis 2: The application of AT has no moderating effect on service quality

Model 2: $QLYSERV = \beta_0 + \beta_1 AATREC + \beta_2 AATPAY + \beta_3 AATINV + \beta_4 AATROLL + e_i$

Table VII demonstrates that the test of hypothesis two yielded an R2 of 0.840, indicating that 84% of the variation in the audit's service quality can be attributed to the use of AT, with the remaining 16% coming from other factors that were not taken into account in the study's model. The model in this study is fit and significant at the 5% level, as confirmed by F-stat (4,357) with a value of 470.199 and a probability value of 0.000, which is less than the critical value of 0.05. Furthermore, the *t*-statistic and *P*-value of the explanatory variables measured by the application of AT to the management of receivables, payables, inventory, and payroll are (3.3367, 0.001), (2,916; 0.032), (25.928, 0.000), and (5.136; 0.000), respectively, suggesting that they all have a positive significant moderating effect on the service quality of an audit.

There was no autocorrelation between the dependent and independent variables, as demonstrated by the Durbin-Watson test result of 1.973, which falls within the 1.5–2.5 thresholds. In addition, the AVE test verified that multicollinearity did not exist.

H03: The application of AT has no moderating effect on service quality

Model 3: $AUDQULY = \beta_0 + \beta_1 AATREC + \beta_2 AATPAY + \beta_3 AATINV + \beta_4 AATROLL + ei$

The implementation of AT dimensions (R^2) as shown in Fig. 1 explained 84.1% of changes in AQ according to the PLS-SEM analysis, with external factors accounting for the remaining 15.9% of the explanation. With a $P < 0.05$ and a 95% confidence interval, the effect was statistically significant. Regarding the use of AT, the endogenous latent variable values were 0.75, 0.50, and 0.25, corresponding to substantial, moderate, and weak, respectively. According to Hair *et al*. (2021) and Ronkko *et al*. (2013), the study indicates that in comparison to the latent variable and the inner model, the structural model, which describes the interactions between the independent variable (the application of AT) and the dependent variable (AQ), the impact of automated accounting systems on AQ is significant.

TABLE VII
Application of Accounting Technology and Service Quality of Audit

Variable	Coefficient	Std. error	*P*-value	*t*-statistics	Multicollinearity statistics	
					Tolerance	VIF
Constant	0.143	0.127	0.263	1.121		
Receivables (REC)	0.115	0.039	0.001	3.367	0.383	2.610
Payables (PAY)	0.032	0.012	0.032	2.916	0.222	4.495
Inventory (INV)	0.927	0.038	0.000	25.928	0.350	2.859
Payroll (ROLL)	0.135	0.031	0.000	5.136	0.644	1.553
R	0.917	.	.			
R^2	0.840	.	.			
Adjusted R	0.839	.	.			
S.E. of regression	0.51124					
Sum Square resid.	93.308					
F-stat.	470.199					
Prob.	0.000					
Durbin-Watson	1.973					

Source: Authors' Computation (2023)

This study examines the impact of automated accounting system dimensions on AQ by using PLS-SEM. The path coefficient represents the coefficient of determination (β), indicating the relative effect of each AT application on AQ. The results (Figs. 2 and 3) show that all automated accounting systems dimension have a positive and significant effect on AQ, except for payable automation, inventory automation (β = 0.189, t = 2.492), payroll automation (β = 0.231, t = 2.695), and receivables automation (β = 0.449, t = 5.939), which are statistically significant at the 95% confidence level, with $P < 0.05$, and $t > 1.96$. However, the relative effect of payable automation was statistically insignificant, with a *t*-value below the acceptable threshold of 1.96.

Overall, this study highlights the importance of automated accounting systems for improving AQ.

Further examination of Figs. and 2 show that a unit change in inventory automation holds a plausible increase in AQ of 0.189 when all other variables are held constant. Similarly, the results demonstrate that a unit change in payroll automation leads to an increase in AQ by 0.231 when all other factors are held constant. Finally, the results demonstrate that a unit change in receivables automation leads to an increase in AQ of 0.449 when all other factors are held constant. In summary, the results indicate that automated receivables have the highest relative impact on AQ, with a coefficient of 0.449, and a *t*-value of 5.939. Furthermore, payroll automation has a coefficient of 0.231 and a *t*-value of 2.695. Finally, inventory automation with a coefficient of 0.189 and a *t*-value of 2.492.

Using the Stone-Gleisser Q^2 value, more research has been conducted to determine the predictive significance of the model. It is determined that Q^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and significant predictive importance, respectively. (Ronkko *et al*., 2013; Sarstedt *et al*., 2017; Hair *et al*., 2021). The relevance of the structural model was confirmed by a Q^2 value greater than zero. The Q^2 value for AQ was 0.540, as shown in Fig. 3. Thus, AT has a high degree of predictive significance in terms of its impact on AQ. As a result, the given structural model is appropriate and has sufficiently high predictive quality. Null hypothesis three (H03), which states that the application of AT has no significant effect on AQ, is rejected by the study because the strength of the PLS-SEM findings in Figs. 1-3 ($Adj\ R^2 = 0.849,\ P = 0.000,\ Q^2 = 0.540$) respectively revealed that the application of AT has a significant and substantial effect on AQ. This also confirms that the application of AT has a moderating effect on AQ.

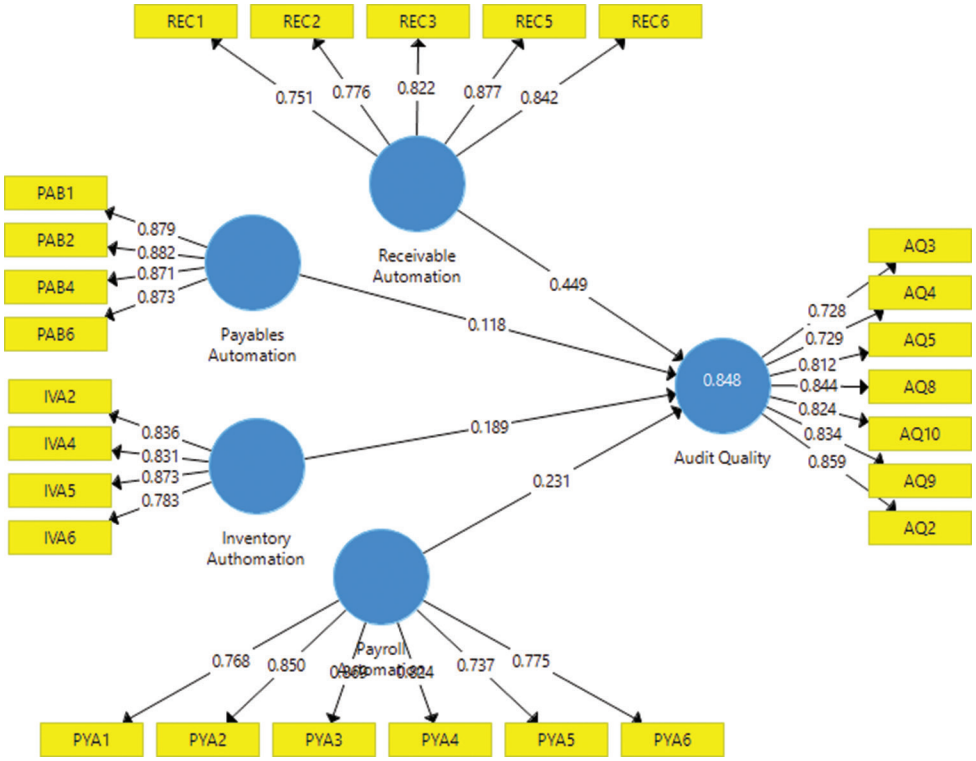

Fig. 1: Path analysis for hypothesis three. Source: Authors' Computation through SmartPLS V3.3.9.

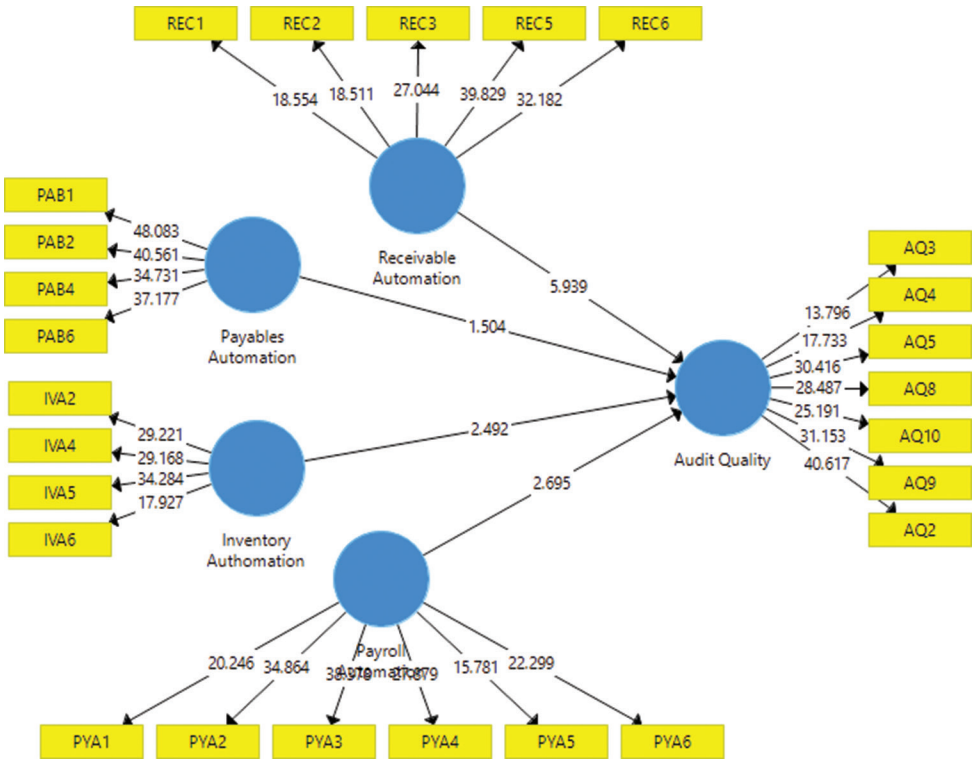

Fig. 2: *t*-statistics for hypothesis three. Source: Authors' Computation through SmartPLS V3.3.9.

The outcome of testing Hypothesis 3 with an R^2 of 0.554, F-stat of 110.11, and probability value of 0.000 established the fact that there is a positive significant moderating influence of the application of AT on the technical quality of the audit. The implication of this is that auditing entities that apply automation to their accounting system will pave the way for the performance of the assurance functions of independent auditors, and the end result will be the enhancement of the technical quality of the audit.

The results of Tjeng and Nopianti (2021), Ababneh and Alrabei (2021), and Sina *et al*. (2021), who discover a notably positive relationship between the use of AT and

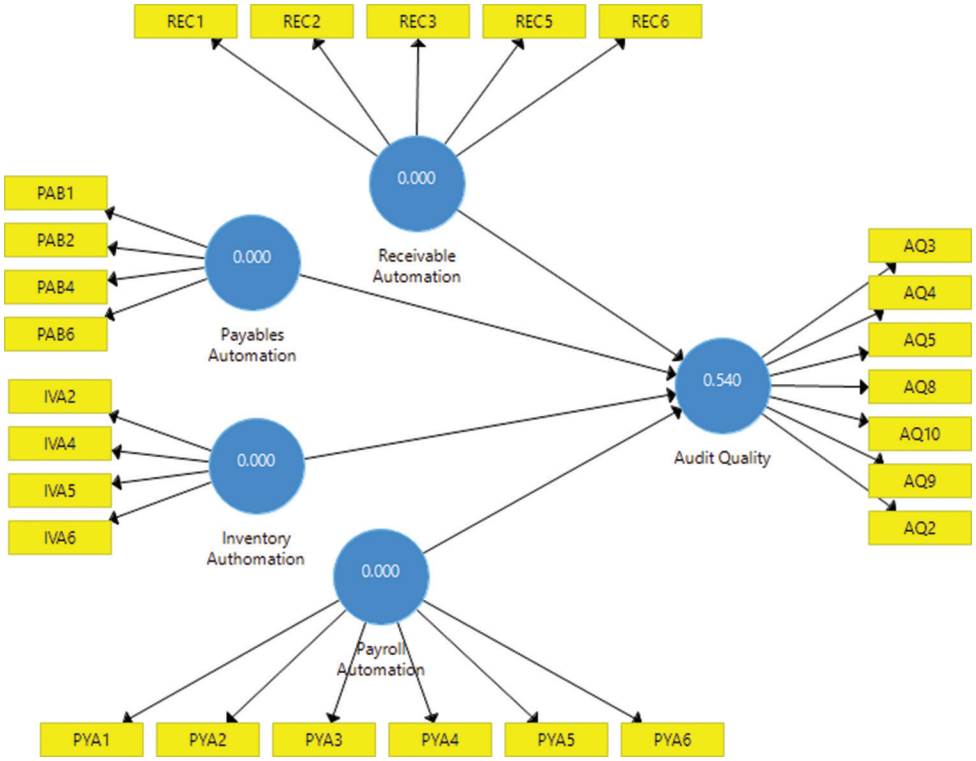

Fig. 3: Q^2 statistics for hypothesis three. Source: Authors' Computation through SmartPLS V3.3.9.

AQ, support this conclusion. This confirms the analysis of replies to FRC (2020, p. 2), where nearly all of those who responded believed that the use of technology might considerably improve AQ, and it offers empirical support for the qualitative findings previously published.

The test for hypothesis one confirms that the application of AT to the accounting activities of entities positively improves the technical quality of the audit for such entities. In addition, the test of hypothesis two reveals an R^2 of 0.840, an F-stat of 470.199, and a probability value of 0.000, which suggests that the formulated null hypothesis should be rejected, and the alternative hypothesis is that AT has a moderating effect on audit service quality. Furthermore, the findings indicate that auditing clients whose operations are managed with the application of AT will pave the way for the auditor to provide services that enhance the outcome of the opinion. This finding aligns with (Okab, 2013: p. 185) that earlier found that using e-auditing to perform audit operations contributes to the performance of an audit's mission efficiently and that it is one of the factors affecting AQ, which can only be possible when service quality is guaranteed.

Finally, the results of the test for hypothesis three are in agreement with the present study's a priori expectations. The results confirm that the application of AT moderates AQ. This finding aligns with the fact that, if AT has a moderate effect on technical and service audits, AQ is guaranteed. This corroborates Duff's (2004) opinion that the technical and service qualities of audits have a significant positive effect on AQ, although the study failed to subject the accounting environment to the implications of accounting automation.

The application of AT, as canvassed by the PCAOB (2013), will reduce the frequency and minimize the impact of financial restatements on errors, which is another way to say that it will promote AQ. It is inferred from the ASIC (2022) that the initiative to improve AQ through auditors' exposure to clients' AT will positively drive audit procedures with an overall effect on audit reports, which will satisfy not only market operators but also other stakeholders.

The overall implication of these findings is that when AQ is enhanced, the expectations of Limperg (1926) have been achieved, and shareholders and other stakeholders would be able to repose confidence in the financial statements rendered by an entity's management. The report lends (lending credibility theory) its voice to the fairness and truthfulness of financial statements.

V. Conclusion and Recommendation

This study examined empirical evidence and confirmed that AT has a positive and significant moderating effect on AQ in Southwest Nigeria. However, auditing theories and practices are universal. Hence, the findings of this study could be applied to other regions, not only in Nigeria but elsewhere.

It is, therefore, concluded that there is empirical evidence that the introduction of IT will enhance AQ, which will make audit reports lend credence to management submission on their stewardship and discharge assurance function to all stakeholders.

It is recommended that adequate training of the engagement team in the appreciation of technology be paramount to all tiers' audit firms, while medium-scale clients should

subscribe to the full automation of all accounting functions, especially in emerging economies.

The wider attention of academics and professionals is suggested to provide more empirical evidence across regions, which will challenge accounting/auditing regulatory agencies and audit standards setters to set appropriate drivers for the application of technologies in auditing processes and procedures.

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