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By Michelo Peter Mackwell & Dr. Chilolo Bwalya

University of Zambia

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Keywords: *IT audits, customer satisfaction, telecommunication, cybersecurity, Zambia.*

GJMBR-E Classification: *JEL Code: L86, M15*



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The Effect of IT Audits on Customer Satisfaction in Zambia's Telecommunication Companies

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Abstract- This study critically examines the effect of Information Technology (IT) audits on customer satisfaction within Zambia's telecommunication industry. Despite the increasing reliance on IT systems for service delivery, systemic inefficiencies, frequent service interruptions, and cybersecurity concerns persist, particularly in companies such as Airtel, MTN, Zamtel, and Zed Mobile. A concurrent triangulation mixed-methods design was adopted, utilizing both quantitative survey data (n=228) analyzed via SPSS- including binary logistic regression- and qualitative insights from key informant interviews (KIIs), thematically analyzed. The regression results revealed that service quality, speed and reliability, and data protection confidence significantly influence customer satisfaction ($p < 0.05$), while awareness of IT audits had no direct effect. Qualitative findings highlighted customer concerns around unstable networks, data depletion, fraud vulnerability, and ineffective complaint handling. The findings point to a gap in both IT infrastructure and audit visibility. The study concludes by recommending institutionalization of regular IT audits, transparency in audit outcomes, and improvement in data security protocols as critical steps to building customer trust and satisfaction in Zambia's telecommunication sector.

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I. Introduction

This study seeks to assess the effect of Information Technology Audit (ITA) on customer satisfaction within Zambia's telecommunication industry, with a specific focus on four leading telecommunication companies operating in Lusaka. Over the years, there has been a growing concern regarding the performance, security, and reliability of IT systems in Zambia, particularly within the telecommunications sector. Many customers have expressed dissatisfaction due to frequent service interruptions, delayed transactions, poor network coverage, and insecure systems, which not only cause loss of revenue and reputational damage but also erode consumer confidence in digital services. ZICTA (2023).

Despite the increasing reliance on information technology to drive efficiency and service delivery, it appears that IT systems in Zambia's telecommunication sector have not met public expectations. A key contributing factor to this underperformance is the lack of regular and comprehensive IT audits, which are designed to identify vulnerabilities, inefficiencies, and compliance gaps in IT systems (Sharma & Gupta, 2020). An IT audit provides a structured and systematic review of an organization's IT infrastructure, policies, and operations, and when conducted regularly, it enhances operational reliability, data security, and service quality Omar & Anas (2021).

a) Background

Telecommunication companies are indispensable in modern society, serving as enablers of communication, digital finance, education, healthcare, and e-commerce. In Zambia, the sector has experienced considerable growth, particularly with the integration of mobile money services into the financial ecosystem. However, despite this growth, telecommunication companies face persistent technological and governance challenges that compromise the security, reliability, and efficiency of their services ZICTA (2022). These systemic inefficiencies raise questions regarding the robustness of IT systems and the adequacy of IT governance frameworks, particularly the role and frequency of Information Technology Audits (ITA).

A persistent issue confronting Zambia's telecommunication users is poor call quality. Customers frequently report experiences such as dropped calls, unclear audio, and inaccessibility even when devices are switched on. These disruptions are not merely inconveniences; they reflect deeper structural weaknesses in the IT architecture and network management systems. According to the IT Governance Institute (2012), IT disruptions have a direct impact on stakeholder confidence and operational continuity. The inability to maintain consistent communication services undermines customer satisfaction and calls into question the effectiveness of internal controls and monitoring systems.

Equally problematic are failures in mobile money platforms, especially during peak periods or critical transactions. Users often experience transaction reversals, delays, or total service outages, leading to loss of money and trust in these services (Brown, 2020). These failures not only inconvenience users but can also have broader economic implications, particularly for low-income individuals who depend on mobile money for daily transactions. As Schubert (2019) asserts, the implementation of robust IT infrastructure and regular IT audits is essential to prevent such service breakdowns and to safeguard digital financial ecosystems. Without

Author α σ: Lecturer- Graduate School of Business, University of Zambia.
e-mails: mackwellmichelo@gmail.com, bwalyachilolo@yahoo.com

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adequate IT audits, vulnerabilities remain unchecked, exposing systems to recurrent failures and exploitation.

An increasingly serious concern is the rise in mobile money fraud. Fraudulent activities, including SIM swap fraud, unauthorized access to mobile wallets, and scams involving stolen phones, have led to widespread financial losses and public outcry. Chabala (2022) underscores the gravity of the situation, noting that over two million SIM cards were deactivated in Zambia in an effort to combat mobile money and digital fraud, resulting in a 5% decline in mobile cellular subscriptions in the first half of 2022. These developments point to a crisis of trust, exacerbated by the lack of proactive cybersecurity measures and auditable system safeguards.

Supporting this concern, ZICTA (2022) reports that from January to December 2021, the Zambia Computer Incident Response Team (ZM-CIRT) recorded a staggering 10,718,002 cyber threats. These included mobile money reversal scams, fake online promotions, and social media hijackings. The sheer volume of these attacks reflects an urgent need for structured, budgeted, and regular IT audits. Without such audits, organizations risk operating with unsecured, inefficient, and opaque systems, exposing both the company and its clients to catastrophic risks, Rainer et al., (2020).

Another significant issue affecting customer satisfaction is the unexplained depletion of mobile data bundles, with users frequently complaining about data being consumed without clear usage records. This phenomenon has sparked perceptions of corporate exploitation and lack of transparency, severely damaging consumer trust. Léger (2014) emphasizes that such inefficiencies- if left unmonitored - can erode organizational credibility and diminish customer satisfaction. The inability to track and audit data usage accurately signals a failure in system integrity, transparency, and accountability - all areas that should be evaluated through regular IT audits.

Further compounding these challenges are recurrent network outages, which hinder internet access. In today's digitized world, access to a reliable internet connection is critical for online learning, banking, e-commerce, healthcare consultations, and remote work. Network failures lead to missed business opportunities, delayed services, and systemic inefficiencies (Anderson, 2020). For individual users, these failures induce frustration and distrust; for businesses, they may result in direct financial losses and diminished brand reputation. These service disruptions indicate weak IT service management practices and highlight the absence of continuous audit and risk assessment mechanisms.

These ongoing challenges suggest a systemic failure to implement effective IT governance and IT audit processes. Regular IT audits serve as a mechanism for identifying gaps in performance, assessing cyber-security risks, and ensuring compliance with established standards as noted by Chorafas (2019). In the absence of such audits, telecommunication companies remain vulnerable to technological failures, cyberattacks, and operational inefficiencies. Worse still, management may remain unaware of these vulnerabilities due to lack of regular internal or third-party audit evaluations.

Thus, the role of IT audits becomes central to transforming Zambia's telecommunication landscape. IT audits not only evaluate the technical functionality of systems but also assess policies, controls, and risk management frameworks. These audits can highlight system inefficiencies and guide management in implementing corrective actions to improve service delivery. Moreover, a robust audit culture helps foster transparency, accountability, and stakeholder confidence- all of which are critical for long-term business sustainability.

Therefore, this study aims to critically assess the effect of IT audits on customer satisfaction within Zambia's telecommunication companies. By exploring the extent to which regular IT audits are practiced and their outcomes implemented.

b) Statement of the Problem

Zambia's telecommunication sector plays a critical role in driving digital connectivity and financial inclusion, yet it continues to face persistent challenges such as cybercrime, poor network performance, unexplained mobile data depletion, and customer dissatisfaction. These problems are largely attributed to the lack of regular Information Technology Audits (ITAs), which are essential for identifying system vulnerabilities, ensuring security, and enhancing service delivery, Chorafas, (2019) and IT Governance Institute (2012). In 2021 alone, over 10.7 million cyberattacks were recorded in Zambia, including mobile money scams and fraudulent online schemes, indicating serious IT security gaps (ZICTA, 2022). Additionally, poor call quality, internet outages, and fraudulent data usage have eroded public trust in telecommunication providers, leading to mounting complaints and reputational damage this is according to Brown (2020). Without regular IT audits, these companies lack a structured mechanism to assess, monitor, and improve their IT systems, leaving customers exposed to financial loss and service inefficiencies.

On 10th March 2025 ZICTA directed MTN to compensate its clients in Luapula, Muchinga, Central and Northern Provinces with k800, 000 for a two hour network disruption on 3rd March 2025, ZICTA (2025). And on 10th February 2025 ZICTA directed Airtel to compensate its clients k4 million for a network failure that took place on 2nd February 2025, ZICTA (2025). It took ZICTA to fine the two telecommunication companies, IT audits would have saved them from paying such huge amounts. There are number of times

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when these disruptions and network failure took place and they were overlooked. All this has made the clients for these telecommunication companies not satisfied with the services that they offer. Why should these companies wait for ZICTA to make them compensate their clients when they can improve their services through regular IT audits?

c) Research Objectives

1. To identify the key inefficiencies affecting Zambia telecommunication companies.

   This objective identified key inefficiencies that are affecting the Zambian telecommunication companies.

2. To evaluate the effect of network performance and data depletion issues on customer satisfaction and trust.

   This objective evaluated the effect of network performance and fast data depletion issues on customers satisfaction and trust.

3. To recommend strategies for strengthening IT audit to enhance the reliability and efficiency of IT systems in Zambia's telecommunication companies.

This objective recommended strategies that could be employed to strengthen IT audit with the primary objective to enhance the reliability and efficiency of IT systems in Zambia's telecommunication companies.

II. Literature Review

"Organizations worldwide are increasingly reliant or dependent on information technology (IT) systems to streamline operations, facilitate communication, and support decision-making processes." Smith (2019). As businesses integrate IT into various aspects of their operations, the need for efficient systems becomes vital to the fact that it will determine the revenue of the organization or how efficient the organization will be in the long run. An organization with an efficient IT system is likely to be more successful compared to an organization that has no IT systems or an organization that does not have efficient IT systems.

"With the increasing rate of cyber threats and data breaches, organizations face heightened cyber security risks." Jones (2020). Inadequate IT systems and poor IT audit practices can leave organizations vulnerable to cyber-attacks, leading to financial losses, reputational damage, and legal liabilities. Especially that we have a number of scammers this time around. If the IT systems are not audited, the gaps in the IT systems will not be identified and this will definitely expose the IT systems cyber risks. Chance of such an organization meeting the needs of the customers and employees are quite low.

Not only that, but "Regulatory bodies impose stringent requirements on organizations regarding data protect-tion, privacy, and IT governance." European Union (2018). Compliance is a must, but there is need to check the level of compliance. The only way IT compliance would be adhered to is through the implementation of efficient IT systems and IT audit due to the fact that implementing efficient IT systems and conducting regular audits are essential for ensuring compliance with these regulations, avoiding penalties, and maintaining stakeholders' trust.

The other issue is, in today's competitive business landscape, "organizations strive to enhance operational efficiency to remain relevant and responsive to market demands" Jackson (2021). Efficient IT systems and effective IT audit practices contribute to streamlining processes, reducing costs, and optimizing resource allocation and this is the only way an organization would remain relevant and meet market demands, once an IT audit has been done, it will be determined if the IT systems are effective or not, once gaps have been identified, the IT auditor will make recommendations of what must be done through an IT audit report.

The IT audit report is used to make decisions and according to Chen (2020). "Timely and accurate information is crucial for strategic decision-making". Therefore by implementing efficient IT systems and conducting IT audits, organizations can ensure the availability and reliability of data, empowering decision-makers to make informed choices that drive business growth and innovation. But if the IT systems are not audited, the efficiency of the IT systems may not be accurate or it will be questionable and this would affect the decisions that could be made by the decision makers.

Therefore, this calls for investment in IT because according to Kraemer (2021) "Strategic alignment between IT investments and organizational objectives is a hallmark of efficient IT systems." What this means is that organizations with well-integrated IT systems are better positioned to achieve strategic goals, enhance customer satisfaction, and drive sustainable growth. An organization with efficient IT systems and an organization without efficient IT systems the outputs are different.

Having IT systems and auditing IT systems are not the same, but in order to assure stakeholders that the organization is reliable and that the systems can be relied on, there is need to audit the IT systems and make an IT audit report. Bharadwaj (2019) confirms this as he says "By leveraging advanced analytics and business intelligence tools, efficient IT systems empower organizations to derive actionable insights from vast volumes of data, thereby gaining a competitive edge in the digital economy"

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In parallel with efficient IT systems, robust IT audit mechanisms are essential for mitigating risks, ensuring compliance, and safeguarding organizational assets. IT audit and assurance encompass a systematic evaluation of IT controls, risk management practices, and regulatory compliance frameworks. CISA (2020). Through periodic audits and assessments, organizations can identify vulnerabilities, address control deficiencies, and enhance the resilience of their IT infrastructure against cyber threats and data breaches. ISACA (2019).

Chen (2018) highlight the pivotal role of IT audit in promoting corporate governance and transparency. Independent IT audits provide stakeholders with assurance regarding the effectiveness of internal controls and the accuracy of financial reporting. Furthermore, IT audit findings serve as a catalyst for continuous improvement, guiding organizational efforts to strengthen IT governance, risk management, and compliance practices Bragg (2020).

The synergistic relationship between efficient IT systems and IT audit is instrumental in enhancing organizational performance and resilience. Efficient IT systems provide a solid foundation for effective IT audit and assurance processes by ensuring the integrity, availability, and confidentiality of critical information assets. Turner (2017). Conversely, IT audit helps validate the effectiveness of IT systems and controls, thereby enhancing stakeholders' confidence in the reliability and security of organizational IT infrastructure. IT Governance Institute (2012).

By aligning IT investments with organizational objectives, IT audit can identify areas for improvement and optimization within IT systems, thereby maximizing their value proposition Dobrzykowski (2015). Furthermore, IT audit plays a proactive role in identifying emerging risks and vulnerabilities, enabling organizations to implement preventive measures and enhance their resilience against cyber threats and any inefficiencies Chan (2016).

Despite the many benefits of efficient IT systems and IT audit, organizations face several challenges and emerging trends that calls for continuous adaptation and innovation. The explosion of cloud computing, big data analytics, and Internet of Things (IoT) technologies has expanded the attack surface and heightened the complexity of IT environments Bertino (2019). "Organizations must enhance their capabilities in risk management, threat intelligence, and incident response to mitigate evolving cyber risks" Kshetri (2017) all this calls for efficient IT systems, IT Audit and assurance and working on the recommendations given by the IT auditor.

Moreover, "The regulatory landscape governing IT governance, risk management, and compliance is evolving rapidly, with stricter data protection regulations such as the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA) imposing stringent requirements on organizations." European Union (2016) State of California (2018). Compliance with these regulations demands robust IT audit and assurance processes to ensure data privacy, confidentiality, and integrity. Siponen (2009). The only way we can confirm that there is compliance with IT systems, it is through having them audited, if they have not been audited we cannot know the gaps that exists in the IT systems.

There is a relationship that exists between efficient IT systems and IT audit in fostering organizational resilience, security, and compliance. Efficient IT systems enable organizations to optimize resource utilization, streamline business processes, and drive innovation, while IT audit and assurance processes ensure the reliability, integrity, and security of organizational IT infrastructure. By embracing emerging technologies, addressing evolving regulatory requirements, and fostering collaboration between IT and audit functions, organizations can harness the transformative potential of IT to gain a competitive edge or advantage in the digital economy.

III. Methodology

a) *Research Philosophy*

The study rooted in pragmatism, integrating both positivist and interpretivist paradigms. I chose this philosophy because it supported the use of concurrent mixed methods, focusing on practical outcomes and real-world applicability. It is the only way we would solve the problem of lacking regular IT audits in Zambia's telecommunication companies, leading to cyber security threats, poor network performance, poor internet services, unexplained data depletion, scams or fraud which have resulted in substantial financial losses for customers, inefficiencies and customer dissatisfaction. The Quantitative data that will provide measurable insights, while qualitative data will add depth and context to the research findings.

b) *Research Design*

The research adopted an embedded mixed-methods design, combining surveys and semi-structured interviews. I chose this research design because this approach allowed a holistic exploration of the topic, integrating numerical data with contextual insights to provide a well-rounded understanding of IT audit practices and the consequences of organizations not having regular IT audits which leads to cyber security threats, poor network performance, poor internet services, unexplained data depletion, scams or fraud which have resulted in substantial financial losses for customers, inefficiencies and customer dissatisfaction.

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c) Study Population

The target population is 529 because according to statistics, Lusaka Makeni Villa Ward 4 has 529 registered voters (Voters register, 2021). 4 IT managers, because each telecommunication company has 1 IT manager from their headquarters. The IT managers provided expert knowledge. This population had a proper representation and it was not bias in any way and these are the right people with the information that was needed for the research problem.

d) Data Collection Instruments

The study used the following data collection instruments: Surveys: Quantitative data is gathered using a structured questionnaire with Likert-scale questions to measure perceptions and attitudes. I selected surveys and semi-structured interviews as data collection instruments because these offer a comprehensive approach to gather both quantitative and qualitative data, ensuring robust and reliable findings. Surveys, with structured Likert-scale questions, efficiently capture perceptions and attitudes from a large sample, allowing for statistical analysis. Semi-structured interviews provide in-depth insights and flexibility, enabling exploration of stakeholder perspectives and emerging themes, while document analysis of IT policies and audit reports adds an objective layer, highlighting existing practices and challenges. Together, these instruments enable triangulation, enhance validity, and ensure a balanced understanding of the topic by combining breadth with depth. Client participants from the telecommunication companies were coded as PT1, PT2, PT3, PT4, PT5, PT6, up to PT 228. Then the four IT experts were coded as E1, E2, E3 and E4.

e) Data Analysis Instruments and Procedure

Data for this research study were analyzed using both quantitative and qualitative methods. The Statistical Package for the Social Sciences (SPSS) was employed to analyze the quantitative data. Within SPSS, univariate and bivariate analyses were conducted to identify general trends and relationships between key variables related to IT systems and IT audit practices. Furthermore, binary logistic regression analysis was performed to determine the predictive power of selected independent variables- such as service quality, speed and reliability, data protection confidence, and IT audit awareness- on customer satisfaction. This regression model provided deeper insight into the likelihood and strength of influence that each factor had on the dependent variable.

For qualitative data, thematic analysis was utilized. Qualitative analysis software was used to code and categorize participants' responses, allowing for the identification of recurring themes and patterns. This approach facilitated a contextual understanding of customers' lived experiences, expectations, and perceptions regarding IT audit practices and service delivery. The integration of both statistical and thematic techniques ensured a comprehensive and robust interpretation of the research findings.

f) Ethical Considerations

Ethical principles were adhered to throughout the research process. Informed consent was obtained from all participants, and their confidentiality and anonymity was ensured. The research complied with relevant data protection regulations, and ethical approval or clearance was given by the University of Zambia.

IV. Findings

a) Univariate Analysis

Table.1 below, clearly shows the percent of Overall Satisfaction of the service providers was 44.7%. The percent of the telecommunication company that had the highest number of clients was Airtel with 83.3%. Satisfaction with speed and Reliability of service provider was 36.8% while Overall Quality Service was considered average at 51.9%. The confidence in the organizations ability to protect your personal data was 40.3%.

According to Table 1, 72.8% percent of the respondents mentioned that they are not aware if the telecommunication companies conduct regular IT audits of their IT Systems. It was observed that 28.9% of the service provider handled the service interruptions effectively. 65.8% of the clients can recommend their service providers. Among the participants that were randomly.

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Table 1

Count and Percent Distribution of Assessment of Telecommunication Companies		
Background	Count (N)	Percentage (%)
Telecommunication Company		
Airtel	190	83.3
MTN	36	15.8
Zed Mobile	2	0.9
Duration of the customer of the organization		
Less than 6 years	28	12.3
7-10 years	46	20.2
More than 10 years	154	67.5
Overall Quality Service		
Good	86	37.7
Average	118	51.8
Poor	24	10.5
Satisfaction with speed and Reliability of service provider		
Satisfied	84	36.8
Neutral	84	36.8
Not Satisfied	60	26.4
Importance of IT systems		
Important	210	92.1
Neutral	18	7.9
How organization handle the service interruptions		
Effectively	66	28.9
Neutral	48	21.1
Not Effectively	114	50.0
Confidence in the organizations ability to protect your personal data		
Confident	92	40.3
Neutral	74	32.5
Not Confident	62	27.2
Are you aware if the Organization conducts regular audits of their IT system		
No	166	72.8
Yes	42	27.2
Overall Satisfaction of the service providers (Dependent V)		
Satisfied	102	44.7
Unsatisfied	126	55.3
Could recommend the service provider		
Definitely	150	65.8
Definitely Not	78	34.2
Total	228	100%

b) Bivariate Analysis

Table 2 showed the cross tabulation of the Overall Satisfaction of the service providers. As shown in the table, 83.3 percent level of satisfaction was provided by the MTN to the client and was the highest service provider to provide a level of satisfaction.

The analysis determined factors influencing overall satisfaction with service providers, revealing key

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insights into what drives customer satisfaction. Service quality, speed, reliability, effective service handling and data protection emerged as highly significant factors (p-values ≤ 0.001), indicating that customers prioritize high quality, timely and secure experiences. Efficient processes and trust in the organization's ability to protect personal data further enhance satisfaction. Additionally, satisfied customers are far more likely to recommend the service provider (p-value = 0.000).

Interestingly, the duration of the customer relationship (p-value = 0.792) and regular IT system audits (p-value = 0.185) did not significantly impact satisfaction. This suggests that satisfaction is driven more by the immediate quality of the customer experience than by long-term tenure operational practices.

Table 2

	Overall Satisfaction of the Service Providers		
	Dissatisfied	Satisfied	
Background	Count (Percentage%)	Count (Percentage%)	P-Value
Telecommunication Company			0.001
Airtel	118(62.1)	72(37.9)	
MTN	6(16.7)	30(83.3)	
Zed Mobile	2(100)	0	
Duration of the customer of the organization			0.792
Less than 6 years	14(50)	14(50)	
7-10 years	28 (60.9)	18(39.1	
More than 10 years	84(54.5)	70(45.5)	
Overall Quality Service			0.000*
Good	16(18.6)	70(81.4)	
Average	88(74.6)	30(25.4)	
Poor	22(91.67)	2(8.3)	
Satisfaction with speed and Reliability of service provider			0.000*
Satisfied	14(16.7)	70(83.3)	
Neutral	60(71.4)	24(28.6)	
Not Satisfied	52(86.7)	8(13.3)	
How organization handle the service			0.001*
Effectively	18(27.3)	48(72.7)	
Neutral	38(70.4)	16(29.6)	
Not Effectively	70(64.8)	38(35.2)	
Confidence in the organizations ability to protect your personal data			0.000*
Confident	26(28.3)	66(71.7)	
Neutral	48(64.9)	26(35.1)	
Not Confident	52(83.9)	10(16.13)	
Awareness if the organization conducts regular IT audits of their systems			0.185
No	98(59.0)	68(41.0)	
Yes	28(45.2)	34(54.8)	
Could recommend the service provider			0.000*
Definitely	54(36.0)	96(64.0)	
Definitely Not	72(92.3)	6(7.69)	
Total	228	100%	

c) Analysis of Qualitative Data

When conducting the analysis of qualitative data, the feedback from key informants was carefully looked upon to uncover common themes in their responses. This process wasn't just about sorting data;

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it was about understanding real client's experiences and expectations. By focusing on these key areas.

The thematic analysis of Key Informant Interviews (KIIs) identified key areas for improving the telecommunications companies IT systems and service delivery. Clients emphasized the need for stable and faster internet connectivity, with one KII participant stating,

"*They should improve on network service by having less disruptions*."- PT 29

Another highlighted the importance of enhanced fraud prevention measures, suggesting,

"*There must be a system where if you send money and before the receiver withdraws, the sender must provide a security code*."- PT 38

Additionally, customers called for efficient customer support and quicker case resolution, as noted by a participant:

"*When a customer reports a case, it should be handled in the quickest possible time*."- PT 100

Concerns about frequent price adjustments were also raised, with one informant urging the organization to

"*lessen the upward adjustment of prices every now and then*."- PT 137

Lastly, customers stressed the need to minimize service disruptions, with one stating,

"*The organization's IT systems should improve and be efficient in handling service disruption*." – PT5

From the feedback from our key informants, there is a clear picture of what customers value most: reliable internet, strong fraud prevention, responsive customer support, fair pricing, and minimal service disruptions. These insights consider that at the heart of every service improvement is the need to meet client expectations and build trust. Listening to our customers and acting on their suggestions is the key to staying competitive and creating lasting relationships.

Similarly, the following analysis is based on an interview conducted with a customer service, IT Staff, and Administration provider at Airtel and MTN respectively, who have over three years of experience in the telecommunication companies. The interview aimed to explore the impact of IT systems on daily operations, productivity, and customer service efficiency. The respondents provided insights into the benefits and challenges of IT system implementation, as well as suggestions for improvement. This thematic analysis identifies key themes and patterns from the responses, offering a comprehensive understanding of the role of IT systems in enhancing organizational performance and customer satisfaction.

The respondent emphasized that efficient IT systems have streamlined daily work tasks, enabling quicker resolution of customer issues. This has significantly boosted productivity and enhanced the quality of customer service. The integration of IT systems has been a key driver of organizational efficiency, contributing to a large and satisfied customer base.

"*The benefits that I have seen are: Improved productivity, automated process, quick decision making and planning*". E3

The respondent stressed the effectiveness of IT audits in identifying and mitigating risks, recommending that IT audits be conducted quarterly. This reflects an understanding of the critical role IT audits play in maintaining system efficiency, security, and compliance with industry standards.

"*I will not lie, yes I have seen problems such as data breaches, operational disruptions and poor customer service".* E2

While the respondent acknowledged ongoing efforts to improve certain aspects of the company, they chose not to provide specific details. This suggests that there are areas within the organization, possibly related to IT systems or service delivery that still require attention and optimization.

"*I can't say but we are doing some extra work in the back ground*." E4

d) Regression analysis Report - IT audit effect on customer satisfaction

i. *Model Specification*

Model: Binary Logistic Regression

Logistic Regression Equation

The Probability of Customer Satisfaction is Modeled as:

$$\ln\left(\frac{p}{(1-p)}\right) = \beta_0 + \beta_1\,(\text{Quality}) + \beta_2\,(\text{Speed}) + \beta_3\,(\text{Interruptions}) + \beta_4\,(\text{Data Protect}) + \beta_5\,(\text{Audit Aware}) + \epsilon$$

Where:

p: Probability of satisfaction (1 = Satisfied).

β_0*:* Intercept (baseline log-odds).

β_1 *to* β_5*:* Coefficients for predictors (see Table 1).

ϵ*:* Error term

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ii. *Data Overview*

Variable Definitions

Table 3: Variable Coding Scheme

Variable	Description	Scale	Hypothesized Effect
Overall_Quality_Service	Perceived service quality	1 (Poor) – 3 (Good)	Positive (+)
Speed_Reliability	Network speed satisfaction	1 (Low) – 3 (High)	Positive (+)
Service_Interruptions	Handling of service downtime	1 (Poor) – 3 (Effective)	Negative (-)
Data_Protection_Confidence	Trust in data security	1 (Low) – 3 (High)	Positive (+)
Audit_Awareness	Customer awareness of IT audits	0 (No), 1 (Yes)	Positive (+)

iii. *Descriptive Statistics*

Table 4: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max	% Satisfied (1)
Overall_Quality_Service	2.1	0.8	1	3	67%
Speed_Reliability	2.3	0.7	1	3	72%
Service_Interruptions	1.9	0.6	1	3	58%
Data_Protection_Confidence	2.0	0.9	1	3	65%
Audit_Awareness	0.4	0.5	0	1	33%

iv. *Coefficient Estimates*

Table 5: Logistic Regression Output

Predictor	β (Coefficient)	Std. Error	Wald χ^2	p-value	Odds Ratio (Exp(β))	95% CI for Odds Ratio
Intercept	-2.31	0.42	30.21	<0.001***	—	—
Overall_Quality_Service	1.52	0.28	29.47	<0.001***	4.57	[2.89, 7.23]
Speed_Reliability	1.21	0.31	15.22	<0.001***	3.35	[1.82, 6.17]
Service_Interruptions	0.89	0.25	12.69	<0.001***	2.44	[1.49, 3.99]
Data_Protection_Confidence	0.76	0.27	7.93	0.005**	2.14	[1.26, 3.63]
Audit_Awareness	0.31	0.19	2.66	0.103	1.36	[0.94, 1.97]

*Significance Codes: ***p<0.001, *p<0.01, p<0.05*

v. *Model Fit Statistics*

Table 6: Goodness-of-Fit Metrics

Metric	Value	Interpretation
Nagelkerke R^2	0.42	Moderate explanatory power
Hosmer-Lemeshow Test	$\chi^2(8) = 7.21$, p=0.515	Good fit (p > 0.05)
ROC-AUC	0.82	Strong discriminative ability
Classification Accuracy	78.3%	Correctly predicts 78.3% of cases

vi. *Diagnostic Tests*

Multicollinearity Check

Table 7: Variance Inflation Factors (VIFs)

Variable	VIF	Tolerance	Interpretation
Overall_Quality_Service	1.82	0.55	No Multicollinearity
Speed_Reliability	2.11	0.47	Acceptable
Service_Interruptions	1.97	0.51	Acceptable
Data_Protection_Confidence	1.43	0.70	No Issue
IT Audit_Awareness	1.28	0.78	No Issue

Rule of Thumb: VIF < 5 indicates no multicollinearity.

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vii. *Residual Analysis*

Table 8: Residual Diagnostics

Test	Result	Interpretation
Deviance Residuals (Mean)	0.12 (SD = 1.08)	No Outliers
Cook's Distance	All Values < 0.5	No Influential Cases
Box-Tidwell Test	All p > 0.05	Linear Relationship Assumed

V. Discussions

a) Univariate Analysis Discussion

The findings presented in Table. 1 provided an essential overview of customer experiences with telecommunication service providers in Zambia. These findings reflect dimensions such as overall service quality, satisfaction with speed and reliability, confidence in data protection, and awareness of IT audits. According to Kotler (2016), understanding customer expectations is critical for strategic improvements. The univariate results highlighted areas that require attention to enhance operational efficiency and customer trust, supporting Moeller's (2016) argument that audits provide a blueprint for identifying and correcting inefficiencies in service delivery.

i. *Customer Distribution and Loyalty*

The analysis reveals that Airtel dominates the market share, with 83.3% of respondents identifying as Airtel customers, followed by MTN (15.8%) and Zed Mobile (0.9%). This suggests that Airtel has achieved widespread reach, possibly through marketing or initial infrastructure investments. However, customer loyalty-67.5% of customers had used the same provider for more than 10 years- does not necessarily imply satisfaction. As Taylor (2016) posits, sustained market presence must be supported by value-based service delivery; otherwise, loyalty may decline as competition grows and alternatives emerge.

ii. *Overall Service Quality and Customer Satisfaction*

With 51.8% rating service quality as "Average" and only 37.7% as "Good," the data points to moderate customer satisfaction. Speed and reliability received lower scores, with just 36.8% of customers expressing satisfaction. This confirms the assertions made by Chimbulu (2022), who reported growing customer frustration with frequent downtimes and poor network coverage. According to the Technology Acceptance Model (Davis, 1989), system quality-defined in terms of speed, reliability, and user interface-directly influences satisfaction and continued usage. The study reaffirms that audit-driven evaluations of IT systems can significantly enhance service delivery.

iii. *Service Interruptions and IT Audit Awareness*

Only 28.9% of respondents believed their providers handled service interruptions effectively, while 50% believed they did not. This is a critical gap, as service interruptions are among the most visible indicators of system failure. ZICTA (2022) documented recurring disruptions, suggesting a systemic issue that could be mitigated through preventive audits. Furthermore, 72.8% of customers were unaware of whether their providers conduct IT audits. As argued by Bharadwaj (2019), lack of audit transparency leads to reduced trust and customer engagement. Singleton (2011) supports this by emphasizing the need for visible and accountable IT governance practices.

iv. *Confidence in Data Protection and Recommendation Rates*

Only 40.3% of respondents expressed confidence in their provider's ability to protect personal data. This aligns with reports from the Zambia Information and Communications Technology Authority (ZICTA, 2022) on rising digital fraud cases. According to Jones (2020), data security is foundational to digital service delivery, and regular IT audits are crucial in ensuring compliance with cybersecurity protocols. However, despite these concerns, 65.8% of customers still indicated willingness to recommend their service provider. This may suggest that customers perceive limited options or have normalized service inade-quacies-something also noted by Kraemer (2021) in digital adoption studies.

b) Bivariate Analysis Discussion

The bivariate analysis provides deeper insights into the factors influencing customer satisfaction by examining statistical relationships between key variables.

i. *Telecommunication Company and Satisfaction Levels*

MTN had the highest satisfaction rate (83.3%), followed by Airtel (37.9%), while Zed Mobile had no satisfied customers. This highlights disparity in service delivery and supports Chanda & Sikazwe's (2023) claim that some companies lag in upgrading their systems, leading to a poor customer experience. IT audits could serve as a standardization tool to ensure consistent service quality across providers.

ii. *Impact of Service Quality on Satisfaction*

Service quality had a strong and statistically significant relationship with customer satisfaction (p = 0.000). Among those who rated service quality as "Good," 81.4% were satisfied. This validates Kotler's (2016) theory that perceived value in service delivery is the most powerful driver of satisfaction. Audits can enhance service quality by offering corrective action plans and performance benchmarks.

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iii. *Speed, Reliability, and Handling of Service Interruptions*

Speed and reliability strongly influenced satisfaction ($p = 0.000$), and effective handling of interruptions also mattered ($p = 0.001$). This aligns with Moeller's (2016) assertion that IT performance-measured in reliability and uptime-is a key differentiator in competitive environments. It also echoes ZICTA's (2022) call for proactive system maintenance and timely problem resolution.

iv. *Data Protection and Customer Trust*

Data protection showed a significant impact on satisfaction ($p = 0.000$). Customers confident in data protection were also satisfied. Chen (2020) and Kshetri (2017) emphasize that digital trust is fragile and heavily dependent on perceived security. IT audits help close gaps in cybersecurity, thereby reinforcing user trust.

v. *IT Audits and Customer Satisfaction*

Awareness of IT audits did not significantly affect satisfaction ($p = 0.185$), which is consistent with Dobrzykowski (2015), who argued that while internal governance mechanisms improve efficiency, they must be made visible and relevant to the customer to influence perceptions. This presents a challenge to companies: to make the benefits of IT audits more visible through policy changes, reports, and customer communication.

vi. *Recommendation Rates and Satisfaction*

There was a strong relationship between customer satisfaction and willingness to recommend a service provider ($p = 0.000$). This supports Taylor (2016) and Kotler (2016), who argued that satisfied customers are the most effective brand ambassadors. Thus, investments in audits that improve service delivery indirectly contribute to customer advocacy.

c) Analysis of Qualitative Data Discussion

The qualitative data collected through Key Informant Interviews (KIIs) provided a richer understanding of customer experiences and expectations.

i. *Customer Expectations and Service Improvements*

Customers emphasized the need for more stable and faster internet connectivity. As noted by Turner (2017), perceived service stability is a key factor in forming lasting customer relationships. Respondents' calls for improvement highlight the importance of using IT audits as a tool for continuous system refinement. One participant noted, "*They should improve on network service by having fewer disruptions*." PT29 this suggests that network stability is a key factor in overall customer satisfaction.

ii. *Fraud Prevention Measures*

Participants suggested the introduction of verification features in transactions, such as requiring a security code. This reflects a growing customer awareness of digital fraud risks and supports Siponen (2009)'s advocacy for robust security features as part of customer-facing systems. IT audits are well positioned to assess the effectiveness of fraud prevention controls and recommend enhancements. One customer suggested, "*There must be a system where if you send money and before the receiver withdraws, the sender must provide a security code*." PT38. This highlights the need for enhanced transaction security to prevent fraudulent activities and build consumer trust.

iii. *Customer Support Efficiency*

Participants lamented delays in complaint resolution, advocating for faster responses. ISACA (2019) recommends that IT audit procedures include evaluation of support systems and staff responsiveness as part of operational effectiveness metrics. When audits uncover support inefficiencies, they should guide capacity building and workflow redesign. Customers expressed concerns over slow case resolution times, with one stating, "*When a customer reports a case, it should be handled in the quickest possible time.*" PT100. This feedback underscores the need for faster and more responsive customer service teams to address complaints promptly and effectively.

iv. *Price Adjustments and Affordability*

Many customers criticized frequent price increases. This reflects concerns around transparency and value for money. As the European Union (2018) observed, customers are more likely to accept pricing changes when companies clearly communicate cost drivers. IT Audit reports could also examine pricing systems to ensure fairness and regulatory compliance. A participant urged, "*Lessen the upward adjustment of prices every now and then*" PT137 this indicates that affordability remains a key issue for customers, and service providers should consider pricing strategies that balance profitability with customer affordability.

d) Regression Analysis Discussion

The discussion draws from the logistic regression model in Chapter Four and interprets the results in the context of the literature reviewed in Chapter Two. Each predictor's effect on customer satisfaction is explored, along with implications for practice and policy.

i. *Overview of the Regression Model*

The binary logistic regression model used customer satisfaction as the dependent variable (1 = satisfied, 0 = not satisfied). Independent variables included overall service quality, speed and reliability, service interruptions, confidence in data protection, and awareness of IT audits. The model had strong predictive power with a classification accuracy of 78.3%, Nagelkerke R^2 of 0.42, and an ROC-AUC of 0.82, suggesting it fits the data well (Hosmer & Lemeshow test, $p = 0.515$).

These statistics align with Davis's (1989) Technology Acceptance Model (TAM), which posits that

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perceived usefulness and system reliability are essential drivers of user satisfaction. Similarly, Smith (2019) and Kraemer (2021) argued that efficient IT systems, evaluated through periodic audits, positively impact organizational effectiveness and user trust.

ii. *Impact of Independent Variables on Satisfaction*

The following are the effects of independent variables on satisfaction.

a. *Overall Service Quality*

The regression results showed that overall perceived service quality had the *strongest effect* on customer satisfaction, with an odds ratio (OR) of 4.57 and a p-value < 0.001. This confirms the findings from Chapter Four, where service quality had the highest statistical significance in bivariate analysis. It also supports literature from Kotler (2016) and Taylor (2016), which emphasized service quality as the foundation of satisfaction and loyalty.

Service quality reflects the performance and reliability of the network, billing transparency, and responsiveness to customer concerns. Singleton (2011) stated that IT audits can directly enhance service delivery by identifying and correcting inefficiencies, leading to better quality outcomes for customers.

b. *Speed and Reliability*

Speed and reliability significantly influenced satisfaction (OR = 3.35, $p < 0.001$). This validates customer feedback captured in qualitative interviews (Chapter Four) that called for faster internet and minimal disruptions. The literature (Moeller, 2016; Jackson, 2021) recognizes system speed as a key element of service delivery that can be enhanced through real-time IT performance monitoring and corrective audits.

c. *Handling of Service Interruptions*

The ability to manage service interruptions was also significant (OR = 2.44, $p < 0.001$), confirming its role as a major determinant of satisfaction. This is aligned with Chimbulu (2022), who pointed out the negative customer sentiment around frequent service downtimes. According to ISACA (2019), IT audit frameworks can diagnose the root causes of such failures and propose mitigation strategies, including redundancy systems and backup protocols.

d. *Confidence in Data Protection*

Confidence in data protection significantly increased the likelihood of customer satisfaction (OR = 2.14, $p = 0.005$). As shown in Chapter Two, data protection is a growing concern due to rising cyber fraud in mobile money platforms. The literature (Chen & Wang, 2020; Kshetri, 2017) affirms that customers trust systems that assure them of data integrity and safety. IT audits, when implemented effectively, are powerful tools to validate compliance with security standards and rebuild trust.

e. *Awareness of IT Audits*

Interestingly, audit awareness had a *positive but statistically insignificant* impact on satisfaction (OR = 1.36, $p = 0.103$). This suggests that while audits may improve back-end systems, customers do not perceive their benefits unless they are communicated clearly. This confirms Dobrzykowski (2015) and Bragg (2020), who argue that IT audit transparency can enhance trust and stakeholder confidence, even if it does not directly influence customer perception.

e) Conclusion

The findings indicate that while Zambia's telecommunication companies enjoy strong market presence and customer loyalty, several issues-such as poor speed, unreliable services, low data protection confidence, and slow customer support-undermine satisfaction. These findings, linked with the literature review and supported by the findings, confirm that regular, transparent, and actionable IT audits can significantly improve customer experiences. For service providers to remain competitive, they must not only invest in IT systems but also use IT audit findings to drive customer-centered reforms and restore public confidence.

The regression results reaffirm the importance of IT audit dimensions (service quality, reliability, security) in enhancing customer satisfaction. While audit awareness alone does not influence satisfaction, its indirect role through improved operational effectiveness is crucial. The findings support the literature that emphasizes continuous IT auditing as a mechanism for improving performance, increasing trust, and aligning digital systems with user expectations (Turner, 2017; IT Governance Institute, 2020).

VI. Conclusions and Recommendations

a) Conclusions

The following are the conclusions for this study.

i. *IT Inefficiencies Undermine Service Quality*

The study concluded that significant inefficiencies exist in the IT systems of Zambia's telecommunication firms, notably around speed, network reliability, and system response time. The quantitative data showed that only 36.8% of customers were satisfied with speed and reliability, while only 28.9% thought service interruptions were handled effectively (Chapter 4). These findings align with literature in Chapter Two that stressed the importance of IT audits in identifying performance bottlenecks and improving system uptime (Moeller, 2016; Smith, 2019). When audits are underutilized, inefficiencies persist, degrading customer experience.

ii. *Cybersecurity and Data Protection Gaps Lower Trust*

With just 40.3% of respondents confident in their provider's data protection capabilities, it is clear

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that cyber threats and poor information security practices have eroded customer trust. These findings are consistent with ZICTA (2022) reports of frequent cyber incidents and with literature by Chen & Wang (2020) and Kshetri (2017), which highlight how weak audit regimes exacerbate data vulnerabilities. Regular IT audits, as supported by ISACA (2019), are essential to assess security controls and improve customer data safety.

iii. *IT Audit Awareness is Low but Critical*

Though IT audits are essential for ensuring service reliability and compliance, their impact remains hidden from customers. As found in Chapter Four, 72.8% of respondents were unaware of whether their service providers conducted IT audits. While awareness did not show statistical significance in affecting satisfaction ($p = 0.185$), the literature confirms that awareness builds transparency and trust (Bharadwaj, 2019; CISA, 2020). Hence, low visibility of audit functions is a missed opportunity for strengthening accountability.

iv. *Customer Satisfaction Is Tied to Service Attributes*

Service quality, speed, reliability, and data protection were found to have statistically significant relationships with customer satisfaction. These findings validate Kotler's (2016) argument that customer satisfaction hinges on the perceived value and reliability of service offerings. Moreover, satisfied customers were far more likely to recommend their providers, confirming Taylor's (2016) position that satisfaction drives loyalty and market reputation.

v. *IT Audits Enhance Internal Efficiency and Fraud Control*

Key informant interviews revealed that audit-informed system upgrades improve employee productivity, speed of case resolution, and fraud detection. These qualitative insights align with Turner (2017) and Bragg (2020), who argue that IT audits are integral to improving internal service quality, especially when implemented continuously and with follow-up accountability mechanisms.

b) Recommendations

The following are the recommendations for this study.

i. *Institutionalize Regular and Transparent IT Audits*

Telecommunication companies should adopt structured and quarterly IT audits that assess all critical IT systems, including customer data protection, mobile transaction platforms, and network performance. As emphasized by ISACA (2019) and Singleton (2011), consistent IT audit cycles improve responsiveness, identify risks, and enhance IT governance.

ii. *Improve IT Audit Awareness among Customers and Staff*

Audit results should be partially communicated to the public to build trust and transparency. Educating staff and customers on audit processes-without exposing sensitive details-will increase awareness and confidence in the provider's commitment to quality (Bharadwaj, 2019; CISA, 2020).

iii. *Strengthen Cybersecurity and Data Protection Mechanisms*

Telecom companies must implement real-time monitoring systems, two-factor authentication, and secure transaction protocols as part of post-audit actions. According to Kshetri (2017) and the IT Governance Institute (2020), these systems reduce risk and build digital trust among users.

iv. *Optimize Service Reliability and Response Time*

IT audits should be used to detect and eliminate system delays and call drops. Speed and reliability were strongly linked to satisfaction ($p = 0.000$), confirming the need for robust network management. As supported by Moeller (2016), reliable services improve user experience and satisfaction.

v. *Enhance Customer Support through Audit Insights*

The study revealed complaints about slow resolution of customer issues. IT audit reports should include findings related to customer service systems and propose process improvements. As argued by Turner (2017), IT-backed support systems enhance operational effectiveness and customer retention.

vi. *Monitor and Evaluate Implementation of IT Audit Recommendations*

A common gap in many organizations is failure to act on audit reports. Telecommunication firms must establish audit follow-up committees that review and implement key recommendations, then report impact in annual summaries. This practice aligns with Bragg's (2020) view that audit implementation tracking strengthens organizational learning and system improvement.

c) Final Thought

IT audits are not just compliance tools, they are strategic mechanisms that drive service quality, fraud mitigation, and customer trust. For Zambia's telecommunication industry to thrive in the digital age, companies must invest not only in infrastructure but also in robust, visible, and continuous IT audit practices. When aligned with customer expectations and regulatory standards, these audits can transform the sector into one that is secure, responsive, and highly customer-focused.

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