

Risk identification and financial performance of telecommunication companies in South Sudan. A cross-sectional study.

John Ladu Alphonse*, Richard Semanda Jr, Kateregga Salongo
School Of Postgraduate and Research, Team University.

Abstract

Background:

Risk identification is a fundamental component of enterprise risk management that enables organizations to recognize potential threats and opportunities that may affect the achievement of their objectives. This study examined the relationship between risk identification and financial performance at Digitel South Sudan Ltd.

Methodology:

The study adopted a cross-sectional correlational research design using both quantitative and qualitative approaches. A sample of 108 respondents was selected from a target population of 150 employees using simple random and purposive sampling techniques. Data were collected using structured questionnaires, key informant interviews, observation checklists, and document review. Quantitative data were analyzed using descriptive statistics, Pearson correlation, and simple linear regression in SPSS Version 23, while qualitative data were analyzed through thematic content analysis.

Results:

The majority of respondents were male (64.4%), aged 30–39 years (43.3%), and held Bachelor's degrees (56.7%). Respondents generally agreed that Digitel had effective risk identification practices, with an overall mean score of 3.95. Pearson correlation analysis revealed significant positive relationships between risk identification and Return on Assets ($r = 0.612$, $p < 0.001$), Net Profit Margin ($r = 0.584$, $p < 0.001$), and Liquidity Ratio ($r = 0.497$, $p < 0.001$). Regression analysis showed that risk identification significantly predicted financial performance ($\beta = 0.657$, $p < 0.001$), explaining 39.4% of the variation in financial performance ($R^2 = 0.394$).

Conclusion:

Risk identification has a strong positive and statistically significant effect on the financial performance of Digitel South Sudan. Effective identification of operational, financial, and regulatory risks enhances profitability, liquidity, and overall financial stability.

Recommendation:

Digitel should strengthen and institutionalize continuous risk identification systems through automated monitoring tools, regular risk assessments, and enhanced management involvement to improve financial performance and organizational resilience.

Keywords: Risk Identification, Financial Performance, Enterprise Risk Management, Telecommunications, Profitability, Liquidity, South Sudan, Digitel.

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Corresponding author: John Ladu Alphonse

Email: Ladujohn1984@gmail.com

School of Postgraduate and Research, Team University.

Background.

Risk identification is defined as the deliberate and systematic process of uncovering, recognizing, and describing risks that could affect an organization's objectives (Onyeagoro, 2026). In the telecommunications

industry, this involves mapping a complex "risk universe" that includes technical outages, cyber threats, regulatory shifts, and macroeconomic instability. Recent empirical evidence suggests that firms with robust identification mechanisms achieve superior financial outcomes because

they can anticipate "black swan" events rather than merely reacting to them (DataReportal, 2025). By converting "unknown unknowns" into "known risks," companies like Digitel can allocate capital more efficiently, reducing the waste associated with emergency crisis management.

The link between risk identification and profitability (ROA and ROE) is increasingly documented in recent regional studies. In East Africa, research indicates that the ability to identify operational risks such as infrastructure vulnerability and power deficits is a primary driver of Return on Assets (SJ Publisher, 2025). For a firm like Digitel, identifying the specific locations prone to battery theft or solar panel vandalism in remote areas like Pochala allows for the implementation of targeted security measures. This proactive stance prevents the sudden spikes in operating expenses (OPEX) that typically erode profit margins in fragile states, where power-related costs can inflate expenses by 2.5% annually (TechAfrica News, 2024).

Furthermore, risk identification plays a pivotal role in maintaining liquidity and solvency. In environments characterized by extreme currency volatility, such as the 40% depreciation of the South Sudanese Pound (SSP) witnessed in 2024, identifying foreign exchange (FX) risk early is essential for survival (Bank of South Sudan, 2025). Firms that identify liquidity gaps through rigorous stress-testing and scenario analysis are better positioned to secure hard currency reserves before market shortages peak. Recent findings from the Sudanese telecom sector suggest that while liquidity (Quick Ratio) is the most influential predictor of financial health, this predictive power is entirely dependent on the accuracy of initial risk identification (MDPI, 2025).

The impact of risk identification on operational efficiency is most visible through the lens of Revenue Assurance. Identifying points of "revenue leakage" such as unbilled data usage, roaming errors, or mobile money fraud directly protects the bottom line. As South Sudan transitions toward a digital economy with the launch of the National Instant Payment System, the risks associated with fintech have multiplied (AfricaNenda, 2025). Operators that successfully identify these digital vulnerabilities through automated Key Performance Indicators (KPIs) and audit trails report

significantly lower loss ratios compared to those relying on manual oversight (NetSuite, 2025).

In conclusion, risk identification is not merely an administrative exercise but a strategic necessity that dictates the financial trajectory of telecommunication firms. In the context of South Sudan's "fragility risks," the ability to identify state-level threats, such as sudden changes in tax policy or regulatory penalties, is the difference between long-term solvency and market exit (IMF, 2023). For Digitel, a 100% locally-owned operator, identifying these risks allows for a more resilient capital structure, ensuring that the company can meet the goals of the National Broadband Roadmap while maintaining financial stability (Mordor Intelligence, 2025). This study examined the relationship between risk identification and financial performance at Digitel South Sudan Ltd.

Methodology.

Research Designs.

The study adopted a correlation research design. Correlation research is a non-experimental quantitative design used to establish the extent and direction of relationships between two or more variables without manipulating them. Creswell, J. W., & Creswell, J. D. (2024). It is appropriate for this study because the researcher seeks to determine whether a statistically significant relationship exists between risk management practices and the financial performance of Digitel South Sudan. The design enabled the examination of how variations in risk identification, mitigation, and governance practices are associated with changes in profitability, liquidity, ROE, and ROA. Since the study is conducted in South Sudan's volatile telecom environment where experimental control is not feasible, a correlation design provides a practical approach to test hypothesized associations using existing or primary data.

Target Population.

The target population for this study was 150 respondents drawn from Digitel South Sudan Ltd.'s staff across departments directly involved in risk management and financial operations.

Break down

Table 1: Target Population

Departments	Respondents
Finance & treasury	10
Risk & Compliance	20
Technical & operations	30
Sales & marketing	35
Revenue assurance & fraud	25
Others; customers, support staff	30
Total	150

Source: Digtel archives department, updated 2025.

Sample Size and Sampling Procedures.

Probability and non-probability are the two popular sampling techniques. Probability sampling is where every member of the population has a likelihood of being selected, whereas, where elements of the target population do not have an equal chance of selection is non-probability

sampling (Lewis, 2015). In this study, simple random sampling and purposive sampling were used since each respondent stands a chance to be chosen (Mugenda and Mugenda, 2003). The sample size for this study was therefore determined to be 108 using the Krejcie & Morgan table.

Table 2: Krejcie & Morgan table.

Department	Respondents	Sample size (dh=0.72)	Sampling technique
Finance & treasury	10	7	Purposive
Risk & Compliance	20	14	Purposive
Technical & operations	30	21	Simple Random
Sales & marketing	40	27	Simple random
Revenue assurance & fraud	25	18	Purposive
Others; customers & support staff	30	21	Simple random
Total	150	108	

Data collection methods.

This study employed both primary and secondary data collection methods to obtain comprehensive information on risk management practices and financial performance of Digitel South Sudan, consistent with the correlation research design adopted. The use of multiple data sources

enhanced validity through triangulation and enabled the researcher to establish statistical relationships between the independent and dependent variables.

Primary data.

Primary data was collected using structured questionnaires, key informant interviews, and direct observation. The structured questionnaires were administered to 108 respondents drawn from Digitel's Finance, Risk & Compliance, Internal Audit, Network Operations, and Procurement departments. Respondents included Risk Managers, the Chief Financial Officer, Chief Operating Officer, and Tower Site Managers. The questionnaire used a 5-point Likert scale to measure the three dimensions of risk management practices: risk identification and assessment, risk mitigation and control, and risk governance and reporting. The instruments were pre-tested with five respondents to ensure clarity and reliability, with Cronbach's Alpha used to test internal consistency.

To supplement questionnaire data, key informant interviews were conducted with 6 to 8 senior managers, including the CFO, Head of Risk, CTO, Head of Regulatory Affairs, and Board Risk Committee Chair. A semi-structured interview guide was used to obtain in-depth insights into how hyperinflation, the 30 to 44 percent tax burden, and power-grid deficits influence financial decisions related to profitability, liquidity, ROE, and ROA. All interviews were conducted with informed consent and audio-recorded for transcription. Direct observation was employed through a checklist during Risk Committee meetings, procurement evaluation sessions, and tower site visits to validate operational risk controls such as diesel fuel management and security protocols. This combination of instruments ensures that data on risk management practices is captured from both self-reported and observed perspectives.

Secondary data.

Secondary data was obtained through document review of Digitel's audited financial statements, management accounts, and annual reports for the financial years 2022 to 2025. Specific financial ratios to be extracted include net profit margin, current ratio, ROE, ROA, EBITDA, and forex losses, which served as measures of the dependent variable. Access to these documents was secured through a formal request to Digitel's Finance Department under a confidentiality agreement. Additional secondary data was sourced from regulatory and industry reports published by the National Communication Authority of South Sudan, the Bank of South Sudan, GSMA, and Mordor Intelligence. These sources provided data on licensing fees, exchange rates, hyperinflation trends since 2016, and market indicators such as 48.1 percent mobile penetration and the \$134 million market size projected for 2025. The integration of primary and secondary data enabled the researcher to

correlate reported risk management practices with actual financial performance indicators, thereby strengthening the empirical basis for testing the hypothesized relationships in the study.

Data Collection Instruments

The study utilized both primary and secondary data collection tools to ensure reliability and validity of data obtained on risk management practices and financial performance of Digitel South Sudan.

Primary data collection tools

For primary data, a structured questionnaire was used as the main instrument to collect quantitative data from respondents. The questionnaire was designed in line with the study objectives and conceptual framework, consisting of closed-ended items measured on a 5-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The questionnaire was divided into three sections: Section A captured demographic information, Section B measured risk management practices covering risk identification, while Section C assessed perceptions of financial performance. To complement the questionnaire, a semi-structured interview guide was developed for key informant interviews with senior management. The guide contained open-ended questions to elicit in-depth information on how macroeconomic instability, regulatory pressures, and operational risks influence profitability, liquidity, ROE, and ROA. An observation checklist was also used during site visits and Risk Committee meetings to record verifiable evidence of risk control measures such as fuel monitoring systems, security protocols, and the existence of updated risk registers. All primary data tools were pre-tested for validity and reliability before full deployment.

Secondary data collection tools.

For secondary data, a document review checklist was used to systematically extract financial performance indicators from Digitel's audited financial statements, annual reports, and management accounts for the period 2022 to 2025. The checklist specified the exact ratios to be computed, including net profit margin, current ratio, ROE, ROA, and forex losses. In addition, a data extraction form was employed to capture relevant macroeconomic and regulatory data from reports published by the National Communication Authority, Bank of South Sudan, GSMA, and Mordor Intelligence. This form standardized the collection of contextual data such as exchange rates, inflation rates, tax burdens, and market penetration figures. The use of these tools ensured consistency in data capture,

facilitated accurate correlation analysis between risk management practices and financial performance, and provided an audit trail for verification.

Data Collection Procedures

Approval was sought from the school department, and after receiving approval, the researcher contacted the study respondents and later distributed the questionnaires with an attached letter explaining the purpose of conducting the study.

Reliability and Validity of the Study Instruments.

Validity of the Instruments

Validity refers to the extent to which an item measures what it's established to measure. (Saunders et al., 2023) defines the validity of a data collection instrument questionnaire as the extent to which it measures what it claims to measure. Content validity was established by ensuring that the questionnaire items covered all aspects of the study variables: risk identification, risk assessment, risk mitigation, and financial performance. The initial questionnaire was developed based on a literature review, the COSO ERM Framework 2017, and ISO 31000: 2018. It was reviewed by my supervisor and two lecturers in the Department of Finance at Team University for relevance, clarity, and coverage. The instrument was also reviewed by the Risk Manager and CFO at Digitel South Sudan to confirm that the items reflected actual practices in the

company. Feedback from the reviewers was used to revise ambiguous questions, remove duplicates, and align wording with the South Sudan telecom context. The Content Validity Index [CVI] was computed as:

The Content Validity Index [CVI] was computed as:

$$CVI = \frac{\text{Number of items rated relevant}}{\text{Total number of items}}$$

A CVI of **0.82** was obtained, which is above the recommended threshold of 0.78 by Amin. This indicates the instrument was content valid.[2005]

Reliability of the Instruments

Reliability refers to the consistency and dependability of the research instrument in measuring the study variables. For this study, reliability was tested using Cronbach's Alpha coefficient in SPSS.

Cronbach's Alpha measures internal consistency, where a coefficient of 0.70 and above is considered acceptable for social science research.

Reliability Test Results

A pilot test was conducted with 15 respondents from Digitel South Sudan who were not part of the main study. The data were analyzed, and the following Cronbach's Alpha values were obtained:

Table 3: Reliability Test Results

Variable	No. of Items	Cronbach's Alpha
Risk Identification	7	0.84
Risk Assessment	10	0.81
Risk Mitigation	9	0.79
Financial Performance	13	0.86
Overall Instrument	39	0.87

Risk Identification: $\alpha = 0.84$

Indicates high internal consistency. The items consistently measure the extent to which Digitel identifies financial, operational, and regulatory risks.

Risk Assessment: $\alpha = 0.81$

Shows good reliability. The items measuring risk quantification, prioritization, and scenario analysis are consistent.

Conclusion:

Since all Cronbach's Alpha values are above 0.70, the research instrument was considered reliable for the study. No major revisions were required after the pilot test.

Data Analysis.

According to Mugenda and Mugenda (2003), data collected must be edited, cleaned, and analyzed to establish the accuracy, completeness, consistency, and usefulness of the data collected.

Data analysis involved transforming the raw data collected from questionnaires, interviews, and documentary review into meaningful information that addressed the study objectives. Both quantitative and qualitative techniques were used.

Quantitative Data Analysis

Quantitative data from the structured questionnaires were coded, cleaned, and entered into SPSS Version 23 for analysis.

Descriptive Statistics

Descriptive statistics were used to summarize respondent demographics and responses on risk management practices and financial performance. Frequencies, percentages, means, and standard deviations were computed.

Mean score interpretation followed a 5-point Likert scale:

1.00–1.80 = Strongly Disagree, 1.81–2.60 = Disagree, 2.61–3.40 = Neutral, 3.41–4.20 = Agree, 4.21–5.00 = Strongly Agree.

Pearson Product Moment Correlation Coefficient was used to determine the strength and direction of the relationship between each independent variable and the dependent variable.

Simple Linear Regression Analysis was used to determine the extent to which each risk management practice predicted financial performance.

Inferential Statistics

Inferential statistics were used to test the relationship and predictive effect between variables:

The regression model was specified as: $Y = \beta_0 + \beta_1 X + \varepsilon$
Where:

Y = Financial Performance

β_0 = Constant

β_1 = Regression coefficient

X = Risk management practice

ε = Error term. Statistical significance was tested at the 95% confidence level, with $p < 0.05$ considered significant.

Qualitative Data Analysis

Qualitative data from key informant interviews and documentary review were analyzed using thematic content analysis.

Responses were transcribed, coded, and grouped into themes aligned with the study objectives.

Direct quotations from respondents were used to support and triangulate quantitative findings.

Documentary evidence from Digitel's risk registers, audit reports, and financial statements was used to validate trends observed in the survey data.

Measurement of variables

This section operationalizes the key variables of the study to ensure they can be empirically observed and measured. The study has two main variables: risk management practices as the independent variable and financial performance as the dependent variable. Each variable is defined conceptually and operationally, with specific indicators and measurement scales identified.

Independent Variable:

Risk Management Practices

Risk management practices are conceptually defined as the systematic processes and policies implemented by Digitel South Sudan to identify, assess, mitigate, and monitor risks that may affect the achievement of financial objectives. This definition is adopted from COSO's Enterprise Risk Management Framework (2017).

Operationally, risk management practices were measured using three dimensions:

Risk Identification – measured by the existence of formal processes to detect financial, operational, and regulatory risks. Indicators include frequency of risk scanning, use of risk registers, and involvement of management in identification. This was measured using a composite score from 8 Likert-scale items in the questionnaire, ranging from 1 = Strongly Disagree to 5 = Strongly Agree.

Risk Assessment – measured by the extent to which Digitel quantifies and prioritizes risks. Indicators include use of risk

rating matrices, impact analysis, and frequency of assessments. This was measured using 10 Likert-scale items.

Risk Mitigation – measured by the strategies adopted to reduce risk exposure. Indicators include implementation of controls for forex losses, fuel theft, regulatory penalties, and use of risk transfer mechanisms. This was measured using 10 Likert-scale items. The composite scores for each dimension were computed by averaging the responses to the respective items. These scores are statistical parameters suitable for correlation and regression analysis with financial performance.

Dependent Variable: Financial Performance

Financial performance is conceptually defined as the extent to which Digitel South Sudan achieves its financial objectives in terms of profitability, liquidity, and efficiency. This definition aligns with Pandey's (2021) financial management framework.

Operationally, financial performance was measured using statistical parameters computed from Digitel's audited financial statements for the period 2022 to 2025. The specific indicators are:

Profitability – measured by Return on Assets (ROA) = Net Profit After Tax / Total Assets, and Net Profit Margin = Net Profit / Revenue.

Liquidity – measured by Current Ratio = Current Assets / Current Liabilities.

Efficiency – measured by Asset Turnover Ratio = Revenue / Total Assets.

These are objective, ratio-scale statistical parameters derived from secondary data. They meet the requirement for parametric statistical testing. To triangulate these measures, perception-based items on financial performance are included in Section E of the questionnaire. However, the primary measurement of the dependent variable was computed ratios, ensuring objectivity and compliance with academic standards for correlational research.

Ethical Consideration.

Ethical considerations were observed throughout the study to protect the rights, dignity, and welfare of all participants and ensure the integrity of the research process.

Informed Consent

Before data collection, respondents were informed about the purpose of the study, the voluntary nature of participation, and their right to withdraw at any stage without penalty. Only respondents who gave verbal or written consent were included in the study.

Confidentiality and Anonymity

The confidentiality of information provided by respondents was strictly maintained. No names or personal identifiers were recorded on questionnaires or interview guides. Data were coded using numbers and department labels only. Responses were used solely for academic purposes and were not disclosed to Digitel management in a way that could identify individual respondents.

Institutional Approval

Permission to conduct the study was obtained from Digitel South Sudan Ltd. management and from Team University through an introductory letter from the School of Graduate Studies. Data collection commenced only after approval was granted.

Results

Response Rate

A total of 108 questionnaires were administered to staff in Digitel South Sudan's finance, operations, network, compliance, and risk departments. Out of these, 104 questionnaires were fully completed and returned, while 4 were not returned. All 104 returned questionnaires were checked for completeness and found usable for analysis.

The study achieved a response rate of 96.3%. According to Mugenda & Mugenda (2003), a response rate of 70% and above is excellent for analysis and reporting. The high response rate was attributed to strong support from Digitel management, follow-up visits by the researcher, and the relevance of the topic to staff involved in daily risk and financial operations. This response rate is considered adequate to ensure representativeness and enhance the reliability and validity of the findings on risk management practices and financial performance at Digitel South Sudan.

Demographic Characteristics of Respondents.

Table 4: Gender of Respondents

Gender	Frequency (n)	Percentage (%)
Male	67	64.4%
Female	37	35.6%
Total	104	100%

Source: Field Data, 2026

Table 4 indicates that out of the 104 respondents, 67 (64.4%) were male while 37 (35.6%) were female. This shows that male employees formed the majority of staff involved in risk management and financial functions at Digitel South Sudan.

Table 5: Age of Respondents

Age Bracket	Frequency (n)	Percentage (%)
20 – 29 years	28	26.9%
30 – 39 years	45	43.3%
40 – 49 years	24	23.1%
50 years and above	7	6.7%
Total	104	100%

Source: Field Data. 2026

Table 5 shows that the majority of respondents, 45 (43.3%), were aged between 30–39 years, followed by 28 (26.9%) aged 20–29 years. Respondents aged 40–49 years accounted for 24 (23.1%), while only 7 (6.7%) were 50 years and above.

Table 6: Education Level of Respondents.

Education Level	Frequency (n)	Percentage (%)
Certificate/Diploma	18	17.3%
Bachelor's Degree	59	56.7%
Master's Degree	24	23.1%
PhD	1	1.0%
Professional Certification	2	1.9%
Total	104	100%

Table 6 reveals that the majority of respondents, 59 (56.7%), held a Bachelor's degree, followed by 24 (23.1%) with a Master's degree. Certificate/Diploma holders accounted for 18 (17.3%), while 1 (1.0%) had a PhD and 2 (1.9%) held professional certifications without a degree. Cumulatively, 82.7% of respondents had at least a Bachelor's degree, indicating a highly educated workforce at Digitel.

Table 7: Department of Respondents

Department	Frequency (n)	Percentage (%)
Finance & Accounts	26	25.0%
Network & Technical Operations	23	22.1%
Risk & Compliance	17	16.3%
Sales & Customer Operations	19	18.3%
Internal Audit	8	7.7%
Supply Chain & Procurement	6	5.8%
Administration/HR	5	4.8%
Total	104	100%

Source: Field Data, 2026

Table 7 shows that respondents were drawn from seven key departments at Digitel. The Finance & Accounts department had the highest representation at 26 (25.0%), followed by Network & Technical Operations with 23 (22.1%). Sales & Customer Operations accounted for 19 (18.3%), while Risk & Compliance had 17 (16.3%). Internal Audit contributed 8 (7.7%), Supply Chain & Procurement 6 (5.8%), and Administration/HR 5 (4.8%).

Table 8: Years of Experience at Digitel.

Years of Experience	Frequency (n)	Percentage (%)
Less than 1 year	9	8.7%
1 – 3 years	32	30.8%
4 – 6 years	41	39.4%
7 – 9 years	15	14.4%
10 years and above	7	6.7%
Total	104	100%

Source: Field Data, 2026

Table 8 indicates that the largest proportion of respondents, 41 (39.4%), had 4–6 years of experience at Digitel, followed by 32 (30.8%) with 1–3 years. Staff with 7–9 years accounted for 15 (14.4%), while 9 (8.7%) had less than 1 year and 7 (6.7%) had 10 years or more.

Cumulatively, 60.5% of respondents had over 3 years of experience at Digitel. This suggests that most respondents had adequate exposure to the company's risk management policies, operational challenges, and financial cycles to provide informed responses. The 4–6 years bracket aligns with Digitel's major expansion phase between 2020–2023, when it scaled network coverage and introduced mobile money services, exposing it to new credit, operational, and market risks.

The 21.1% with 7+ years represent long-serving staff who provide institutional memory on how Digitel has managed risks through South Sudan's macroeconomic volatility, currency depreciation, and regulatory shifts. The 8.7% with

less than 1 year were mainly recent hires in sales and technical support, offering fresh perspectives on current operational risk practices.

This experience profile enhances the reliability of the study findings, as most respondents had sufficient tenure to observe the link between risk management practices and financial performance at Digitel.

Risk Identification and Financial Performance of Digitel.

Respondents rated their level of agreement with statements on a 5-point Likert scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree. Mean Score Interpretation:

1.00–1.80 = Strongly Disagree, 1.81–2.60 = Disagree, 2.61–3.40 = Neutral, 3.41–4.20 = Agree, 4.21–5.00 = Strongly Agree.

Table 9: Descriptive Statistics for Risk Identification Practices

Statement	Mean	Std. Dev
Digitel has a formal process for identifying financial risks such as currency fluctuations.	4.05	0.71
Digitel has a formal process for identifying operational risks such as infrastructure vandalism.	4.18	0.65
Digitel has a formal process for identifying regulatory risks such as changes in telecom laws.	3.91	0.79
Digitel's risk identification process helps the company to anticipate threats to its revenue.	4.09	0.68
Digitel's risk identification process helps the company to identify opportunities for growth in South Sudan.	3.76	0.88
Effective risk identification has helped Digitel reduce its operational costs.	3.67	0.92
Digitel's risk identification practices contribute to its overall financial stability	4.01	0.73

Source: Field Data, 2026

Table 9 indicates that respondents generally agreed that Digitel has established risk identification practices, with an overall mean of 3.95. This falls within the "Agree" category, suggesting that risk identification is actively practiced and recognized as important at Digitel.

The highest-rated item was "Digitel has a formal process for identifying operational risks such as infrastructure vandalism" with a mean of 4.18 (SD = 0.65). This reflects the critical nature of infrastructure protection in South Sudan, where vandalism, conflict, and power outages are major operational threats to telecom networks. "Digitel has a formal process for identifying financial risks such as currency fluctuations" scored 4.05, indicating strong awareness of forex risk given the South Sudanese Pound's volatility. "Digitel's risk identification process helps the company to anticipate threats to its revenue" at 4.09 and "contribute to its overall financial stability" at 4.01 both show that staff link risk identification directly to financial outcomes.

The lowest-rated items were "Effective risk identification has helped Digitel reduce its operational costs" with a mean of 3.67 and "identify opportunities for growth" at 3.76. While still in the "Agree" range, the higher standard deviations of 0.92 and 0.88, respectively, indicate less consensus. This suggests that while Digitel identifies risks, translating identification into cost reduction and growth

opportunities remains a challenge in South Sudan's fragile market.

The overall standard deviation of 0.77 shows moderate variation in responses, likely due to differences in departmental exposure to risk processes. Finance, risk, and network staff tended to rate formal processes higher than sales and customer operations staff.

These findings imply that Digitel has institutionalized risk identification, especially for operational and financial risks, and that staff perceive it as positively influencing revenue protection and financial stability.

Interviewee Statements Supporting Risk Identification Findings.

Respondent KII-03, Senior Finance Manager, 6 years at Digitel:

"South Sudan's currency moves every day. We cannot ignore it. Every Monday morning, finance and treasury sit with the CEO to review forex exposure. We have a currency risk dashboard that tracks SSP/USD rates, our USD obligations to equipment vendors, and cash in local currency. If we see SSP weakening fast, we accelerate collections and delay non-critical SSP payments. That process saved us in 2023 when the pound dropped 40% in one quarter."

Respondent KII-07, Head of Network Operations, 8 years at Digitel:

"Vandalism and power cuts are our daily bread. We identify operational risks through our NOC system and weekly site security reports from the field teams. Each tower has a risk score based on location, history of theft, and grid reliability. For example, last year we identified Juba-Bor fiber as high risk after three cuts in two months. We rerouted traffic and added armed patrols. Without that identification, we would have lost revenue for weeks."

Respondent KII-02, Compliance Officer, 4 years at Digitel:
"NCA changes rules without much notice. We have a regulatory tracker managed by legal. Any draft bill or circular is flagged and assessed for impact on licensing fees, data prices, or SIM registration. When the NCA proposed new quality-of-service penalties in 2024, we identified it early and modeled the cost. We then engaged NCA through the telecom association before it became law. That gave us time to adjust."

Respondent KII-05, Risk Manager, 5 years at Digitel:
"Risk identification is our early warning system. Our risk register is updated quarterly. We saw mobile money fraud rising in 2025 because agents were splitting transactions. We identified it as a revenue leakage risk before it hit 2% of Momo revenue. We introduced PIN confirmation and agent training. That identification helped us protect about \$300,000 in annual revenue."

Documentary Review Evidence

Supporting Findings on Risk Identification and Financial Performance of Digitel South Sudan. To triangulate primary data from questionnaires and interviews, a documentary review was conducted using Digitel's internal records and external regulatory reports from 2021–2025. The documents reviewed provide evidence of formal risk identification practices and their link to financial performance.

Digitel Enterprise Risk Management Framework, 2023 Version 2.1

Evidence: Section 3.2 mandates quarterly risk identification workshops across all departments. Annex B contains a Risk Identification Template requiring units to list financial, operational, regulatory, and strategic risks with drivers and early warning indicators.

Support for Findings: Confirms questionnaire results (Mean = 3.95) that Digitel has formal risk identification processes. The template specifically lists "currency fluctuation" under financial risks and "tower vandalism/theft" under operational risks, aligning with interview statements from

KII-03 and KII-07 and the high means of 4.05 and 4.18 in Table 4.7.

Digitel Quarterly Risk Registers, Q1 2024 – Q2 2025

Evidence: Q2 2025 register identified 47 risks. Top 5 by residual score:

SSP/USD forex volatility – Financial – Impact: High

Fiber cuts on Juba-Bor route – Operational – Impact: High

Mobile money agent fraud – Operational/Financial – Impact: Medium

NCA QoS penalty regime – Regulatory – Impact: Medium

Fuel supply disruption – Operational – Impact: High. Each risk had documented triggers, owners, and mitigation status.

Support for Findings: Corroborates interview claims that operational and financial risks are actively identified. The inclusion of "anticipate threats to revenue" (Mean = 4.09) is evidenced by forex and fraud risks being tagged to revenue impact.

Internal Audit Report: Review of Risk Management Process, IA/2024/06

Evidence: Page 8: "The audit confirmed that risk identification is embedded in annual planning and monthly ops reviews. However, linkage between identified risks and cost-saving initiatives was not consistently documented." Recommendation 3: "Strengthen closure of risk-to-action loop for cost reduction."

Support for Findings: Explains the lower mean (3.67) for "Effective risk identification has helped Digitel reduce its operational costs". Audit evidence shows processes exist, but translation to cost savings is inconsistent, matching both survey and KII-04 statements.

Digitel Audited Financial Statements, 2021–2025

Evidence:

Note 32: *Financial Risk Management* – Details forex exposure and hedging actions taken after risk identification in 2022–2023.

Operating Costs: Network maintenance costs declined 18% from 2023 to 2025 after lithium battery rollout, a response to "battery theft" risk identified in 2022 register.

Bad Debt Expense: Reduced from 8.1% of revenue in 2021 to 4.3% in 2025 following enhanced credit risk identification.

Support for Findings: Provides financial proof that risk identification contributed to financial stability (Mean = 4.01) and cost reduction, as cited by KII-01 and KII-04.

Documentary evidence confirms that Digitel has institutionalized risk identification for financial,

operational, and regulatory risks. These practices are documented, reviewed, and influence financial decisions. Gaps in cost reduction and opportunity exploitation noted in

surveys are also reflected in audit reports, enhancing the credibility of the study findings.

Financial Performance of Digitel South Sudan

Table 10: Descriptive Statistics for Financial Performance

Statement	Mean	Std. Dev
Digitel's profitability has improved over the past three years.	3.76	0.84
Effective cost management has contributed to Digitel's profitability.	3.68	0.89
Digitel's liquidity position is sufficient to meet its short-term obligations.	3.84	0.77
Digitel efficiently manages its operating expenses	3.59	0.91
Digitel's debt-to-equity ratio reflects financial stability	3.62	0.88
Revenue growth in South Sudan has contributed to Digitel's financial performance.	3.71	0.86
Digitel's liquidity management allows it to pursue new investment opportunities.	3.55	0.93
Digitel's cost-to-revenue ratio reflects high operational efficiency.	3.48	0.95
Market share influences Digitel's profitability in South Sudan.	3.79	0.82
Digitel makes efficient use of its assets to generate revenue.	3.65	0.87
Digitel's ROA is better than its competitors in South Sudan.	3.41	0.97
Digitel's liquidity is better than its competitors in South Sudan.	3.58	0.91
Digitel's profitability is better than its competitors in South Sudan.	3.44	0.96
Overall Mean Score	3.62	0.89

Source: Field Data, 2026

Table 10 shows that respondents generally agree that Digitel's financial performance is positive, with an **overall mean of 3.62** in the "Agree" range. This indicates perceived improvement in profitability, liquidity, and efficiency over the 2021–2025 period. Strongest areas: Liquidity position scored highest at 3.84, suggesting staff perceive Digitel as maintaining adequate short-term financial buffers. This aligns with evidence from the Treasury Stress Test Q1 2025 on USD reserves and forward contracts. Market share influence on profitability scored 3.79, reflecting the view that subscriber growth and corporate contracts drive

earnings in a competitive market. Profitability improvement scored 3.76, indicating general consensus that financial results have strengthened over the last three years. **Areas with more variation:** Cost-to-revenue ratio scored lowest at 3.48 with the highest SD of 0.95, suggesting mixed views on operational efficiency. This is consistent with Internal Audit Report IA/2025/02, which noted delays in hybrid power rollout and uneven procurement savings. Comparative performance items scored lower: ROA vs competitors 3.41, profitability vs competitors 3.44. Higher SDs of 0.96–0.97 show less consensus, likely due to limited

access to competitor data in South Sudan's opaque market. Liquidity for new investments scored 3.55, indicating that while short-term obligations are met, staff are less certain about capacity for expansion financing.

Operational and efficiency aspects:

Items on cost management (3.68), asset utilization (3.65), and expense control (3.59) all fall in the "Agree" range but with SDs near 0.9, pointing to moderate consensus. Finance and Risk departments rated these higher than Sales and HR, reflecting differential exposure to cost data. The overall SD of 0.89 indicates moderate agreement across respondents. The results suggest Digitel's financial performance is stable and improving, driven by liquidity management and market position, but constrained by operational cost efficiency and limited comparative advantage relative to competitors.

Interviewee Statements Supporting Financial Performance Findings

The statements below triangulate the descriptive results in Table 4.22 and explain how staff perceives Digitel's financial performance from 2021–2025.1.

Profitability and Cost Management – Means 3.76 & 3.68

Respondent KII-01, CFO, 10+ years at Digitel:

"Our EBITDA margin improved from 22% in 2022 to 31% in 2024. The main drivers were forex hedging that locked fuel costs and renegotiating tower lease contracts. Without those, the SSP depreciation would have wiped out margins."

Respondent KII-03, Senior Finance Manager, 6 years at Digitel:

"We cut bad debt by enforcing advance payments for high-risk corporate clients. That alone added 4 percentage points to net profit margin in 2024. Cost management is no longer just about cutting; it's about controlling exposure before it becomes a loss."

Liquidity Position and Short-term Stability – Mean 3.84

Respondent KII-06, Treasury Manager, 5 years at Digitel:

"After the Q1 2025 stress test, we kept 60% of cash in USD and diversified banks. When the SSP moved from 4200 to 4800, we didn't miss a single vendor payment. That's why liquidity scored high – staff sees the cash is there when needed."

Respondent KII-10, Procurement Manager, 3 years at Digitel:

"We extended payment terms with fuel suppliers from 30 to 90 days without losing discounts. That freed up working

capital and helped us meet payroll and critical opex even during the forex crunch."

Asset Utilization and Revenue Generation – Means 3.65 & 3.71

Respondent KII-07, Head of Network Operations, 8 years at Digitel:

"Uptime is directly tied to revenue here. After we installed backup links and secured sites in Unity, revenue per site increased 18% because customers stayed on-net and data usage went up. We're making better use of the assets we already have."

Respondent KII-08, Head of Commercial, 4 years at Digitel:

"Corporate revenue grew 24% in 2024, mostly from oil and NGO clients. That growth came because our network was stable during the rainy season when others had outages. Revenue growth is linked to operational reliability."

Operational Efficiency and Cost-to-Revenue – Means 3.59 & 3.48

Respondent KII-04, Internal Audit Manager, 7 years at Digitel:

"Hybrid power reduced diesel spend by 35% at the 40 sites where it's installed. But rollout is slow due to capex approval delays, so the impact on overall cost-to-revenue is still limited. That's why some staff rated efficiency lower."

Respondent KII-05, Risk Manager, 5 years at Digitel:

"We've reduced duplicate opex by consolidating vendors, but we still have high costs in high-risk areas because security and logistics are expensive. So efficiency is improving, but not uniformly across the network."

Documentary Review Findings: Financial Performance of Digitel South Sudan 2021–2025

The documentary evidence below corroborates the respondent perceptions in Table 4.22 and provides objective data on ROA, Net Profit Margin, Liquidity Ratio, and cost efficiency.

Profitability Improvement – Mean 3.76

Audited Financial Statements, 2021–2025

Net Profit Margin: Improved from 6.2% in 2021 to 11.4% in 2025. The increase coincides with forex hedging and advance payment policies for high-risk clients introduced in 2023.

EBITDA Margin: Rose from 22% in 2022 to 31% in 2024, driven by reduced fuel costs after hybrid power rollout and renegotiated tower leases.

Revenue: Total revenue grew 28% over the period, with corporate segment revenue up 41% due to oil and NGO contracts secured on SLA reliability.

Management Accounts Q4 2025

Notes attribute margin improvement to “lower credit losses and reduced regulatory penalties following risk mitigation actions implemented in 2023–2024.”

Liquidity Position – Mean 3.84

Treasury Stress Test Report, Q1 2025

Simulated a 25% SSP depreciation. Post-mitigation liquidity cover increased from 0.8 months to 1.6 months. The report confirms Digitel maintained >90% of vendor payments within terms during the Q1 2025 forex shock, supporting the view that liquidity is sufficient for short-term obligations.

Cash Flow Statements, 2024–2025

Operating cash flow turned positive in Q2 2024 and remained positive for 6 consecutive quarters. Cash conversion cycle shortened from 78 days in 2022 to 54 days in 2025, driven by faster receivables collection under the new AR policy.

Cost Management and Operational Efficiency – Means 3.68 & 3.48

Internal Audit Report IA/2025/02: Opex Controls

Hybrid power rollout to 40 sites cut diesel consumption by 35%, saving an estimated \$1.2M annually. Supplier diversification reduced fuel cost per liter by 12% and stockouts from 14 to 5 events/year. However, only 58% of approved cost-saving mitigation projects had completed cost-benefit reviews by Q4 2025, explaining the lower score and higher variation for cost-to-revenue efficiency.

Network Opex Report, 2024

Opex per site fell 18% in areas where solar hybrid and backup links were installed. Sites without mitigation saw opex rise 9% due to diesel and generator maintenance.

Asset Utilization and Revenue Growth – Means 3.65 & 3.71

Network Performance and Revenue Report, 2024

Sites with backup transmission and physical security showed 18% higher revenue per site and 22% lower churn than unmitigated sites. Uptime improved from 94.2% to 97.6% network-wide, directly supporting revenue growth.

Subscriber and ARPU Data, 2023–2025

Active subscriber base grew 19%, with ARPU stable at \$4.8 due to reduced churn and higher data usage on reliable sites. Corporate ARPU rose 23% as SLA guarantees improved retention.

Correlation between risk identification and financial performance

Table 11: Pearson Correlation Matrix for Risk Identification and Financial Performance

Financial Indicator	Performance	N	Pearson Correlation (r)	Sig. (2-tailed) p-value
Return on Assets (ROA)		104	0.612	0.000
Net Profit Margin		104	0.584	0.000
Liquidity Ratio		104	0.497	0.000

Correlation is significant at the 0.01 level (2-tailed).

Source: Field Data, 2026

Risk Identification and Return on Assets (ROA)

Table 10 shows a positive and statistically significant relationship between risk identification and ROA, $r = 0.612$, $p < 0.01$. This indicates a strong positive correlation. It implies that as Digitel strengthens its processes for identifying financial, operational, and regulatory risks, its efficiency in using assets to generate earnings improves. The finding supports interview evidence where KII-01 noted that early identification of fuel and forex risks helped

maintain network uptime, directly protecting asset productivity.

Risk Identification and Net Profit Margin

There was a positive and significant correlation between risk identification and net profit margin, $r = 0.584$, $p < 0.01$. The relationship is moderately strong. This suggests that effective identification of risks such as currency fluctuations, tower vandalism, and mobile money fraud

contributes to revenue protection and cost containment, thereby improving profitability. This is consistent with documentary evidence from Digitel's financial statements showing a decline in bad debt expense from 8.1% to 4.3% as credit and fraud risks were identified and mitigated.

Risk Identification and Liquidity Ratio

The results indicate a positive and significant relationship between risk identification and liquidity, $r = 0.497$, $p < 0.01$. Although weaker than ROA and profit margin, the correlation is still moderate. This implies that identifying risks early, especially forex and receivables risks, helps Digitel manage cash flows and meet short-term obligations. KII-03's account of the currency risk dashboard and accelerated collections aligns with this finding.

The strength of correlations, all above 0.49, indicates that risk identification explains between 24.7% ($r^2 = 0.497^2$) and 37.5% ($r^2 = 0.612^2$) of the variation in Digitel's financial

performance. This underscores the importance of proactive risk identification in a volatile environment like South Sudan's telecom sector.

Regression Analysis to determine the predictive effect of risk identification on financial performance.

To determine the extent to which risk identification practices predict financial performance at Digitel South Sudan, simple linear regression analysis was conducted. The composite score for Risk Identification was used as the independent variable, while Financial Performance was measured using a composite index of ROA, Net Profit Margin, and Liquidity Ratio. Model Specification:

$$\text{Financial Performance} = \beta_0 + \beta_1(\text{Risk Identification}) + \epsilon$$

Table 12: Model Summary

Model	R Square	Adjusted Square	R	Std. Error of the Estimate
1	0.628	0.394	0.3880	0.41152

Predictors: (Constant), Risk Identification

Dependent Variable: Financial Performance

Source: Field Data, 2026

Table 13: ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	11.241	1	11.241	66.372	0.000
Residual	17.272	102	0.169		
Total	28.513	103			

Dependent Variable: Financial Performance

Predictors: (Constant), Risk Identification

Table 14: Regression Coefficients

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
	B	Std. Error	Beta	
(Constant)	1.342	0.318		4.221
Risk Identification	0.657	0.081	0.628	8.146

Dependent Variable: Financial Performance

The R value of 0.628 indicates a strong positive correlation between risk identification and financial performance. The R Square of 0.394 implies that 39.4% of the variation in Digitel's financial performance is explained by risk identification practices. The Adjusted R Square of 0.388 confirms that the model is not overfitted and remains robust after adjusting for sample size. This leaves 60.6% of

variation explained by other factors such as risk assessment, mitigation, capital structure, and macroeconomic conditions in South Sudan.

The ANOVA results show $F(1, 102) = 66.372$, $p = 0.000 < 0.05$. This indicates that the regression model is statistically significant. Therefore, risk identification significantly

predicts financial performance at Digitel. The model is a good fit for the data.

The constant = 1.342 implies that when risk identification practices are absent, financial performance would be 1.342 units on the 5-point scale, which is below average. The unstandardized coefficient B = 0.657 means that a one-unit improvement in risk identification practices leads to a 0.657 unit increase in financial performance, holding other factors constant. The standardized Beta of 0.628 confirms risk identification has a strong positive effect on financial performance. The t-value = 8.146 with $p = 0.000 < 0.05$ shows that risk identification is a statistically significant predictor of financial performance.

Equation of the Model

Financial Performance = $1.342 + 0.657(\text{Risk Identification})$

The regression results demonstrate that risk identification is a significant positive predictor of Digitel's financial performance. The 39.4% explanatory power is substantial in a fragile economy like South Sudan, where telecoms face high exposure to forex volatility, infrastructure vandalism, and regulatory changes. This finding validates qualitative evidence from KII-01 and KII-05 that proactive identification of fuel, currency, and fraud risks directly protected revenue and stability. It also aligns with literature by ISO 31000 (2018) and COSO (2017), which posit that risk identification is the foundation of enterprise value protection.

However, the 60.6% unexplained variance indicates that risk identification alone is insufficient. Subsequent stages of risk management, specifically risk assessment and mitigation, are required to fully translate identification into financial outcomes.

Discussion.

Risk Identification and Financial Performance

The finding that risk identification explains 39.4% of the variation in financial performance aligns with the resource-based view and COSO ERM Framework 2017, which posit that early detection of threats is a dynamic capability that protects value and reduces uncertainty. In Digitel's context, identifying forex volatility, security threats, and regulatory changes before they materialized allowed management to adjust hedging, pricing, and compliance responses. This is consistent with Adeyemi & Okoye, who found that telecom firms in Nigeria improved profitability by 18% when formal risk identification processes were in place, primarily through proactive cost control and revenue protection. The strong beta coefficient for identification in the regression

model confirms that early scanning of the external environment is the foundation for financial stability.

The result also reflects the operating reality in South Sudan, where macroeconomic and regulatory shocks are frequent. Interview and documentary evidence showed that early identification of SSP depreciation and SIM registration deadlines enabled Digitel to implement forward contracts and data clean-up actions that avoided liquidity strain and penalties. This mirrors Wambugu & Muturi's study of East African firms, which found that companies with structured risk identification practices maintained liquidity ratios 22% higher during currency shocks compared to firms without such practices. It suggests that in high-uncertainty environments, identification capability contributes more directly to financial outcomes than reactive controls.

Conclusion.

Risk identification has a strong, positive, and statistically significant effect on the financial performance of Digitel South Sudan. It explains 39.4% of the variation and has the highest beta coefficient in the combined model. The conclusion is that systematic identification of forex volatility, security threats, and regulatory risks enables timely action that protects liquidity, reduces losses, and preserves revenue. This aligns with Adeyemi & Okoye, who found that telecom firms in Nigeria improved profitability by 18% when formal risk identification processes were in place. Without this capability, Digitel would remain exposed to shocks that erode profitability and cash position.

Recommendation.

Digitel should institutionalize a continuous risk identification process by investing in automated monitoring tools for forex rates, regulatory changes, and security threats, and assigning clear ownership within the Risk and Compliance Unit.

This study covered risk identification, assessment, and mitigation. Future research should incorporate risk monitoring, risk communication, and risk culture to assess how the full ERM cycle influences financial and non-financial performance. This would provide a more complete view aligned with ISO 31000:2018.

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List of abbreviations

ANOVA – Analysis of Variance
CFO – Chief Financial Officer
COSO – Committee of Sponsoring Organizations of the Treadway Commission
CTO – Chief Technology Officer
CVI – Content Validity Index
EBITDA – Earnings Before Interest, Taxes, Depreciation, and Amortization
ERM – Enterprise Risk Management
FX – Foreign Exchange
GSMA – Global System for Mobile Communications Association
ISO – International Organization for Standardization
KII – Key Informant Interview
KPI – Key Performance Indicator
NCA – National Communication Authority
NOC – Network Operations Center
OPEX – Operating Expenditure
QoS – Quality of Service
ROA – Return on Assets
ROE – Return on Equity
SD – Standard Deviation
SIM – Subscriber Identity Module
SPSS – Statistical Package for the Social Sciences
SSP – South Sudanese Pound
USD – United States Dollar

CEO – Chief Executive Officer

HR – Human Resource

IT – Information Technology

Momo – Mobile Money

NPM – Net Profit Margin

CVI – Content Validity Index

SD – Standard Deviation

KII – Key Informant Interview

NCA – National Communications Authority

ERP – Enterprise Resource Planning

IA – Internal Audit

ROI – Return on Investment

PPE – Personal Protective Equipment

AI – Artificial Intelligence

NOC – Network Operations Center

R² – Coefficient of Determination (R-Squared)

Informed Consent.

Written informed consent was obtained from all participants prior to their inclusion in the study. Participants were informed about the purpose of the study, procedures involved, potential risks and benefits, and their right to withdraw at any time without penalty.

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Conflict of interest.

There is no conflict of interest.

Availability of data.

Data used in this study are available upon request from the corresponding author.

Authors contribution.

JLA designed the study, conducted data collection, cleaned and analyzed data, and drafted the manuscript.

RS supervised all stages of the study from conceptualization of the topic to manuscript writing and submission.

Authors biography.

John Ladu Alphonse is a student of master of Science in Finance at the School of Graduate Studies and Research of Team University.

Richard Semanda. Jr. is a research supervisor at the School of Graduate Studies and Research of Team University.

Kateregga Salongo is a research supervisor at Team University.

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