ADVANCED GLOBAL OUTSOURCING STRATEGIES APPLIED TO OPERATING EXPENDITURE REDUCTION IN NETWORK OPERATING CENTER SERVICES

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ABSTRACT

This study investigates the commercial and cost-saving impacts of Advanced Global Outsourcing strategies—namely Request for Information (RFI), Request for Proposal (RFP), and Electronic Reverse Auction (eRA)—on Network Operating Center (NOC) services within the African telecommunication sector. It evaluates their effectiveness in reducing total costs using a Total Cost of Ownership (TCO) framework. Utilizing a comparative study methodology of a case company, the research analyzes internal procurement and operational data of existing five vendors across five Operating Companies (OPCOs) with the collected pricing data at each stage of the multi-staged procurement process RFI, RFP and eRA in the global outsourcing environment. The findings reveal a progressive reduction in costs from RFI to eRA, with eRA yielding the most significant OPEX savings. By applying TCO analysis, this study offers practical insights for optimizing vendor management and reducing operational expenditures (OPEX) through structured sourcing frameworks.

Keywords: *Advanced Global Outsourcing, Telecom OPEX, RFI, RFP, eRA, Total Cost of Ownership (TCO)*

บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อวิเคราะห์ผลกระทบในเชิงพาณิชย์และศักยภาพในการประหยัดต้นทุนของกลยุทธ์การเอาท์ซอร์สระดับโลกขั้นสูง ได้แก่ การร้องขอข้อมูล (RFI) การร้องขอข้อเสนอ (RFP) และการประมูลย้อนกลับทางอิเล็กทรอนิกส์ (eRA) ที่มีต่อการให้บริการศูนย์ปฏิบัติการเครือข่าย (NOC) ในภาคอุตสาหกรรมโทรคมนาคมของทวีปแอฟริกา โดยใช้กรอบแนวคิดต้นทุนรวมในการเป็นเจ้าของ (TCO) ในการประเมินประสิทธิภาพด้านการลดต้นทุน การศึกษานี้ใช้ระเบียบวิธีวิจัยเชิงเปรียบเทียบผ่านกรณีศึกษาของบริษัทหนึ่ง โดยวิเคราะห์ข้อมูลภายในของผู้ให้บริการ 5 รายจาก 5 บริษัทในเครือ (OPCOs) ที่เกี่ยวข้องในกระบวนการจัดซื้อจัดจ้างหลายขั้นตอน ได้แก่ RFI, RFP และ eRA

ผลการวิจัยชี้ให้เห็นว่ามีการลดลงของต้นทุนอย่างต่อเนื่อง โดย eRA ให้ประโยชน์ด้านการลดค่าใช้จ่ายในการ
ดำเนินงาน (OPEX) ได้มากที่สุด งานวิจัยนี้ให้ข้อเสนอแนะเชิงปฏิบัติในการบริหารจัดการผู้ขายและเพิ่มประสิทธิภาพ
ต้นทุนผ่านกรอบการจัดซื้อจัดจ้างที่มีระบบโครงสร้างที่มีมาตรฐาน

คำสำคัญ: การเอาต์ซอร์สระดับโลกขั้นสูง ค่าใช้จ่ายในการดำเนินงานของอุตสาหกรรมโทรคมนาคม การร้องขอข้อมูล
การร้องขอข้อเสนอ การประมูลย้อนกลับทางอิเล็กทรอนิกส์ ต้นทุนรวมในการเป็นเจ้าของ

INTRODUCTION

In an increasingly competitive telecom landscape, African telecom operators are under constant pressure to reduce costs, improve efficiency, and ensure service reliability. One of the key operational areas where cost reduction efforts are focused is the Network Operating Center (NOC), which is central to telecom infrastructure management. Advanced Global Outsourcing strategies—namely Request for Information (RFI), Request for Proposal (RFP), and Electronic Reverse Auction (eRA)—have emerged as powerful tools to streamline sourcing, enhance transparency, and reduce operational expenditure (OPEX).This study focuses on evaluating the impact of these outsourcing strategies using a Total Cost of Ownership (TCO) framework across five Operating Companies (OPCOs) in Africa. By comparing historical cost data with cost outcomes from structured outsourcing processes, the study aims to uncover cost trends and inform procurement decisions. The findings offer practical guidance for sourcing professionals, demonstrating how structured and multi-stage procurement can deliver both immediate and long-term financial benefits.

Network Operating Centers (NOCs, pronounced as the word "knocks") started during the 1960s in the telecom industry. The earliest Telecom NOC was opened by the American Telephone and Telegraph (AT&T) Company in 1962, using status boards to display switch and routing information to monitor real-time data. (Ref: Wikipedia). A Network Operating Center (NOC) in the telecom industry is a centralized facility. It comprises essential resources such as technicians, hardware, and software equipment to control and manage Network performance, generate reports of traffic analysis, detect faults for diagnostics, and perform service maintenance. With the help of smart devices that produce alerts, alarms, traffic statistics, and performance measurement reports, technicians at the network operations center (NOC) can remotely monitor and manage the various network elements 24/7.

Case Study Overview
The case company for this study operates as the centralized procurement and sourcing arm of a leading African Telecom Operator with a footprint in ten Operating Companies (OPCOs) across the continent. Facing increased pressure to reduce NOC-related OPEX, the company launched a sourcing initiative covering five countries. The initial cost baseline across these OPCOs totaled USD 11 million annually. Major cost drivers included labor,

facility leases, hardware/software tools, and maintenance contracts with five different local vendors (Vendor 1, Vendor 2, Vendor 3, Vendor 4, Vendor 5).

Figure 1: Cost Optimization Initiative
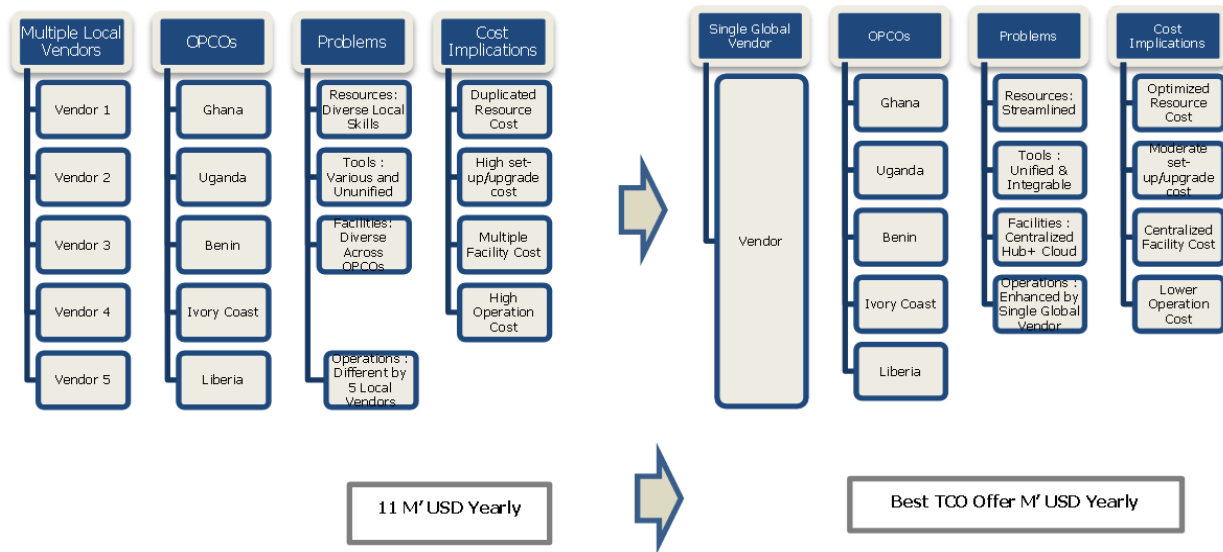
In pursuit of annual OPEX savings, case company identified five high-spending OPCOs—Ghana, Uganda, Benin, Ivory Coast, and Liberia—for a cost optimization initiative focused on Network Operating Center (NOC) services (Figure 1). A diagnostic assessment revealed redundant local vendors, fragmented operational tools, diverse organizational structures, and inefficient operating models, all contributing to elevated operational expenditures of 11M USD annually. To address these inefficiencies, the case company implemented a multi-stage strategic outsourcing model consisting of Request for Information (RFI), Request for Proposal (RFP), and Electronic Reverse Auction (eRA). The initiative transitioned from a decentralized structure relying on five local vendors to a single global vendor model, aimed at streamlining operations, unifying tools, and consolidating facilities—ultimately delivering the most competitive Total Cost of Ownership (TCO) offering.

Research Questions
This study is structured around the following three guiding research questions to examine the cost implications of outsourcing Network Operating Center (NOC) services within the African telecom sector. These questions aim to uncover not only the cost-saving potential of Advanced Global Outsourcing strategies but also their long-term financial impact, as assessed through the Total Cost of Ownership (TCO) framework. These three research questions support the overall research aim of applying Advanced Global Outsourcing techniques for OPEX reduction in cost-sensitive telecom industry.
1. How does Advanced Strategic Global Sourcing impact the operating expenditure (OPEX) of Network Operating Centers (NOCs) services of African Telecom Company?
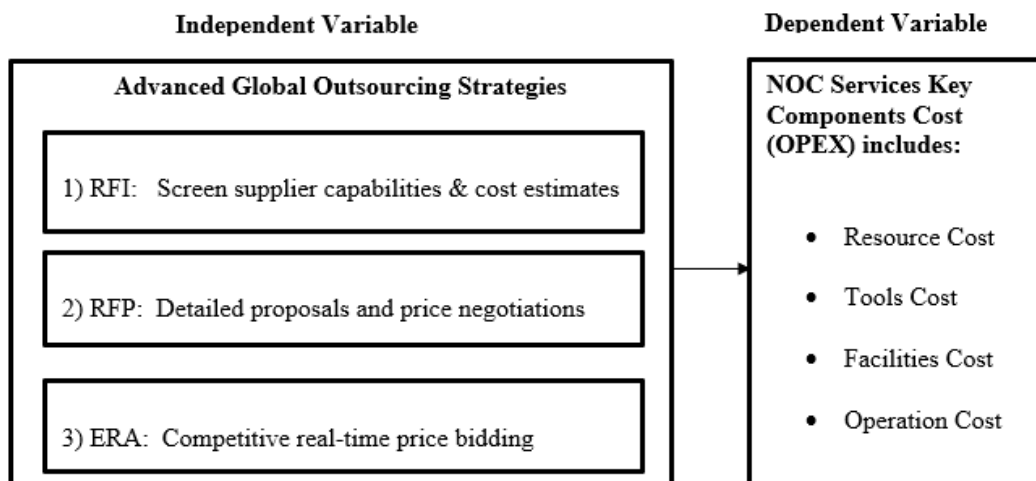
2. Which advanced global outsourcing methods (RFI, RFP, eRA) are associated with the greatest cost savings in the procurement of NOC services?
3. Do the techniques differentiate the level of TCO-based OPEX cost savings?

Specifically, this research aims to explore and evaluate the effectiveness of Advanced Global Outsourcing strategies—namely, the Request for Information (RFI), Request for Proposal (RFP), and electronic Reverse Auction (eRA)—in reducing operational expenditures (OPEX) related to Network Operating Center (NOC) services in a leading African telecom company. To achieve this, the study has two primary objectives:

− To identify and compare the commercial cost patterns observed before and after applying Advanced Global Outsourcing for NOC services in African Telecom Company.
− To demonstrate the different levels of OPEX cost impacts through Advanced Global Outsourcing strategies (RFI, RFP, ERA) using quantitative data, to support informed decision-making in procuring NOC services for telecom companies.

The first objective seeks to provide a clear, data-driven comparison of cost structures associated with outsourcing NOC services. By analyzing historical expenditure data across different phases—pre-outsourcing and post-outsourcing—the study will identify patterns, anomalies, and trends in commercial costs. The second objective focuses on analyzing the impact of each sourcing tool—RFI, RFP, and eRA—on overall OPEX reduction. By using quantitative metrics from collected data of a telecom company, the study will assess how each method contributes uniquely to cost savings, procurement transparency, and competitive vendor selection. The objective is to display financial outcomes and to inform procurement professionals and decision-makers in the telecom industry about best practices and strategic considerations when applying these methods. The findings will further support a more structured and evidence-based approach to global outsourcing, enabling telecom companies optimizing cost.

CONCEPTUAL FRAMEWORK

Independent Variables: From the left, the independent variable in this model is "Advanced Global Outsourcing Strategies," which includes three specific components:

1. **Request for Information (RFI)**: A preliminary procurement or sourcing process for gathering information about suppliers, their capabilities, and potential solutions.

2. **Request for Proposal (RFP)**: A detailed solicitation inviting suppliers to submit bids for specific projects or services.

3. **Electronic Reverse Auction (eRA)**: An online, Real-time bidding process where suppliers compete to offer the best prices for services or goods.

Dependent Variable: The dependent variable is NOC Services Cost (OPEX), which represents the operational expenditures involved in managing and maintaining the NOC Services, which includes Resource Cost, Tools Cost, Facilities Cost, and Operation Cost.

Relationships: The arrows in the framework indicate a direct impact of the components of global sourcing strategies (RFI, RFP, eRA) on Network Operating Centers NOC Services Cost. This relationship is measured only by cost impact.

Scope of the Research
This study focuses on the impact of Advanced Global Outsourcing Strategies on reducing Operating Expenditures (OPEX) for NOC Services within the telecom sector, specifically targeting a telecom company operating in Africa. The scope is defined as:

Analyzing the OPEX Cost Impact: Comparing pre- and post-outsourcing OPEX for NOC services in the Telecom Industry.

Techniques Studied: Evaluating the impact of specific Advanced Global Outsourcing methods, including:

- Request for Information (RFI): Supplier information gathering with preliminary cost.
- Request for Proposal (RFP): Competitive bidding for services.
- Electronic Reverse Auction (eRA): Realtime online price competition.

Focused Metrics: Assessing the cost impact in four key areas of NOC services: Resource Cost, Tools Cost, Facilities Cost, and Operation and Maintenance Cost.

Locations of the comparative studies: The location of this comparative study focuses only on five African countries: Uganda, Benin, Ivory Coast, Ghana, and Liberia.

Significance of the TCO in the Research:
The Total Cost of Ownership (TCO) framework plays a critical role in this research by providing a comprehensive method for evaluating direct and indirect costs associated with outsourcing Network Operating Center (NOC) services. Rather than focusing solely on the initial procurement price, TCO analysis considers a broader set of financial factors—such as operational, maintenance, infrastructure, and lifecycle costs—which are essential for understanding the real economic impact of outsourcing decisions. By incorporating TCO

analysis, this study assesses the immediate cost-saving opportunities achieved through Advanced Global Outsourcing methods (RFI, RFP, and eRA) and captures long-term commercial implications. These include insights into resource optimization, supplier performance, contract sustainability, and the potential for scaling operations efficiently. Such a comprehensive approach enables decision-makers to evaluate outsourcing strategies not just on short-term budget reductions but also on their alignment with the company's strategic and financial goals. Ultimately, the framework supports a comparative evaluation of sourcing scenarios by quantifying immediate cost reductions and long-term economic value, such as reduced network downtime, contract flexibility, scalability of operations, and performance-based incentives. Additionally, the TCO analysis plays a crucial role in strategic procurement by indicating areas where hidden or indirect costs—such as administrative overhead, contract management expenses, delays in service delivery, or unexpected support requirements and how this cost can gradually reduce the overall value of the outsourcing arrangement. At the same time, it helps to highlight the importance of specific supplier behaviors, contractual terms, or operational practices that contribute to long-term efficiency gains, such as proactive maintenance, performance-based incentives, technology upgrades, or bundled service offerings. These two facts allow decision-makers to avoid cost impacts and to strategically select suppliers who deliver sustained value beyond the initial contract period. This view is critical in a telecom context where outsourcing decisions often involve trade-offs between cost, service-level performance, and risk exposure. The TCO framework enables procurement leaders to align supplier selection and outsourcing strategies with broader organizational goals such as cost leadership, operational excellence, and sustainable competitive advantage.

REVIEW OF RELATED LITERATURE

Strategic Sourcing: Strategic sourcing has evolved from simple cost reduction to a comprehensive framework aimed at value creation. According to A.T. Kearney's Purchasing Chessboard, competitive tendering and global sourcing are most effective in high-demand, low-supply markets. Advanced Global Outsourcing incorporates technology-enabled methods like e-Sourcing and Reverse Auctions to drive cost competitiveness and supplier performance.

The A.T. Kearney **Purchasing Chessboard®** serves as a strategic sourcing tool that maps procurement strategies based on the relative power of supply and demand (Figure 2). It categorizes market conditions into four quadrants and offers 64 actionable methods aligned under 16 levers and four overarching strategies: leverage competition, manage spend, change demand, and seek joint advantage. For high-demand but low-supply environments—typical in specialized telecom services—recommended tactics include **global sourcing, RFI/RFP process, reverse auctions, total cost ownership, best shoring, and supplier market intelligence**. These methods, as highlighted in the study's approach, enable organizations to mitigate supply risk while optimizing cost and performance.

Figure 2: The A.T. Kearney Purchasing Chessboard®
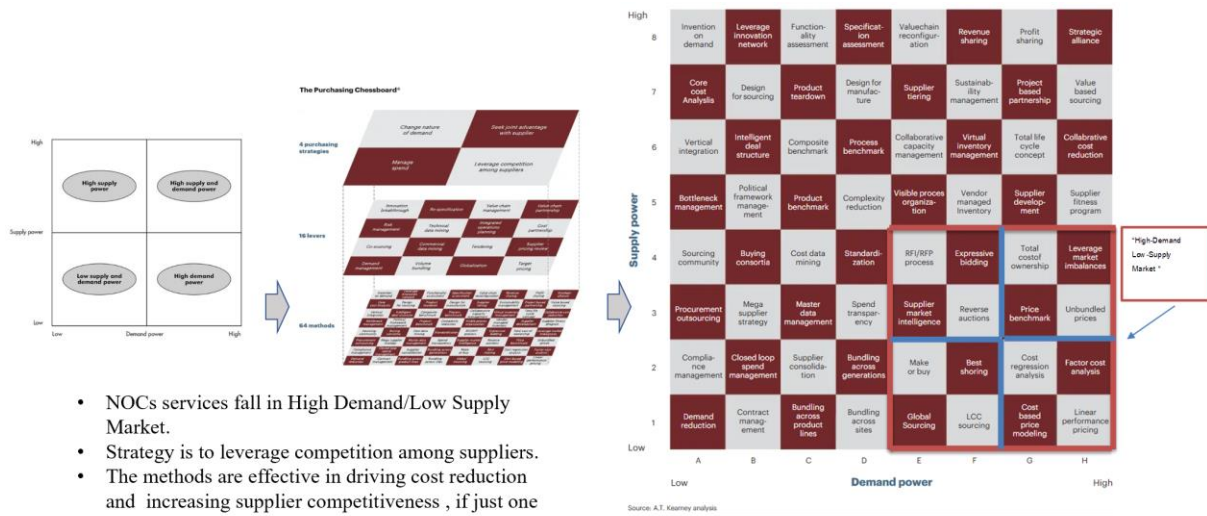
- NOCs services fall in High Demand/Low Supply Market.
- Strategy is to leverage competition among suppliers.
- The methods are effective in driving cost reduction and increasing supplier competitiveness, if just one methods is used.

Source: A.T. Kearney (2017)

Table 1: 7-Step Strategic Sourcing Process

	Comply levers	Demand levers	Process levers	Source levers	Fulfil levers	Manage levers
Procurement value levers	Spend governance	Eliminate demand	Type of sourcing event	Bundle/ unbundle	Demand/supply balancing	P2P control
	Policy compliance	Review quantity	Cycle time	Supplier rationalization	Ordering	Variations
	Budget compliance	Reduce frequency	Prioritize projects	Volume or time commitment	Physical delivery	Risk
		Standardize specs	Buying channels	Pricing mechanism	Storage and distribution	Performance
		Reduce portfolio	Source from OEM	Performance or benefit incentives	Contract compliance	Value delivery
		Consider alternatives		Risk allocation	Repair and replacement	
		Encourage reuse		Payment terms	Transaction cost	
				Additional benefits (revenue, marketing, etc)		
Initiate a sourcing project	*Identify business needs and study the market*	*Specify requirements*	*Define a sourcing strategy*	*Select a supplier and award a contact*	*Manage a contract and supplier relationship*	*Review results and close*

Source: Dovgalenko (2020)

The Strategic 7-Step Sourcing Process stated in the Technology Procurement Handbook by Dovgalenko (2020) offers a structured and repeatable framework for aligning procurement functions with organizational goals (Table 1). Widely applied in the telecom sector, it integrates spend analysis, market research, competitive bidding, and supplier performance management to drive cost efficiency and strategic value (Dovgalenko, 2020). In telecom operations, this model enables organizations to define needs, engage the market, select vendors, and monitor contract performance through a TCO-focused approach. Its

adaptability has been demonstrated in both manufacturing and service industries—such as in HVAC and high-tech sectors—where cross-functional teams, risk management, and performance-based contracting were central to managing procurement during disruptions like COVID-19 (Mathews, 2022; Blaha, 2002; Quiñonez, 2013). The 7-step process remains especially relevant for centralized sourcing and OPEX optimization in telecom NOC services, ensuring transparency, accountability, and long-term value creation.

Figure 3: Total Cost of Ownership (TCO) Model
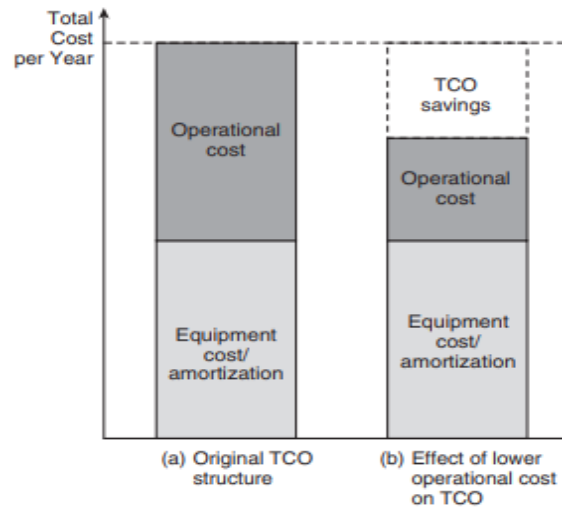

Source: Clemm (2006)

The Total Cost of Ownership (TCO) model (Figure 3) extends beyond upfront pricing to capture indirect and long-term costs, including resource utilization, tools deployment, and operational maintenance. Studies by Kakabadse and Kakabadse (2005) and Lacity & Willcocks (2017) emphasize the strategic use of RFI and RFP for supplier screening and negotiation, while reverse auctions enhance transparency and cost efficiency.

In telecom, where operational costs can exceed infrastructure investments, outsourcing NOC services has shown promise in reducing OPEX. Case studies by GSMA (2013) and MTN Consulting highlight the potential of structured sourcing strategies to optimize vendor selection and standardize service delivery. This literature supports the relevance of a multi-stage sourcing approach evaluated through TCO analysis to guide telecom procurement transformation. For telecom companies, conducting a thorough Total Cost of Ownership (TCO) analysis is essential to assess both direct and indirect costs of outsourcing. This includes evaluating supplier performance, operational risk, and long-term service quality (Dovgalenko, 2020). According to Omdia (2024), Network Operations represent the largest share of telecom OPEX, exceeding costs in infrastructure and utilities (Figure 4). Within this category, outsourced NOC services account for the highest expenditure, especially in emerging markets. Supporting this, MTN Consulting (2023) reports that Network Operations OPEX constituted approximately 17% of total OPEX

between 2016–2022, with projections indicating a further 20–30% increase due to rising service demands and complexity.

Figure 4: Global Telecom OPEX Flow, 2023
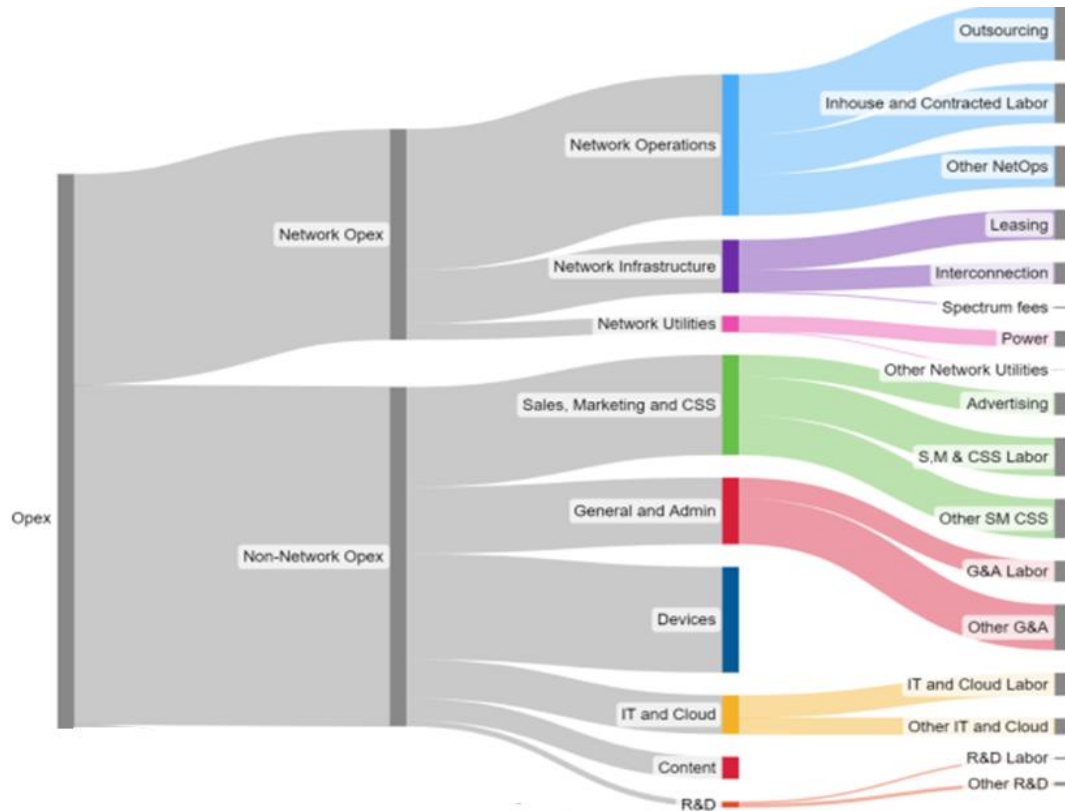
Source: Omdia (2023)

RESEARCH METHODOLOGY

This study adopts a comparative case study methodology using both primary and secondary data to evaluate the impact of RFI, RFP, and eRA sourcing methods on OPEX reduction for Network Operating Center (NOC) services. Data were collected from the procurement records of a case company, which operates as the procurement arm for a major telecom provider with ten operating companies across Africa. Five OPCOs—Ghana, Uganda, Benin, Ivory Coast, and Liberia—were selected based on the scale of operations and availability of reliable cost data. Primary data included vendor pricing obtained during each sourcing phase, while secondary data included historical OPEX costs from June 2023 to May 2024. Each stage—RFI, RFP, and eRA—was executed in a stepwise process using an e-Sourcing platform. Descriptive analysis and ANOVA were used to compare costs across sourcing stages and identify statistically significant cost differences. The TCO model was applied to assess direct and indirect cost impacts covering resources, tools, facilities, and

operations. The figure of the research model (Figure 5) is adapted from the procurement Research Model (Lysons & Farrington, 2020).

Figure 5: Research Model
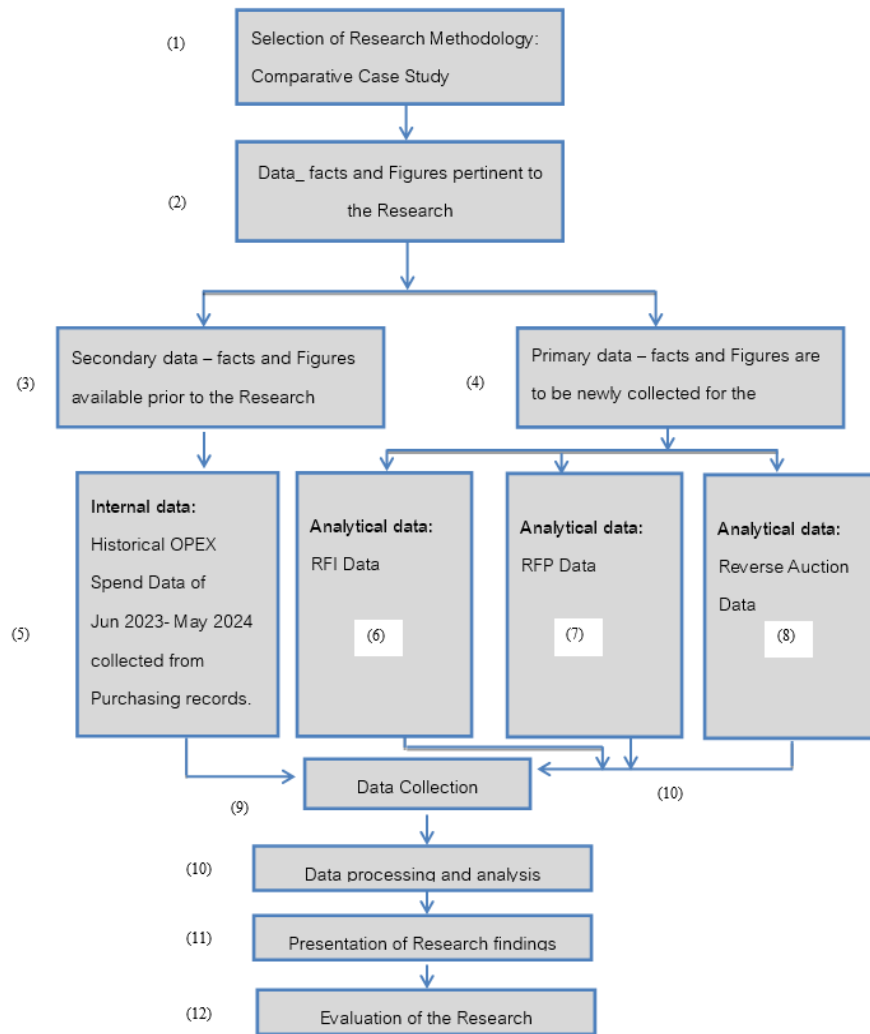
Source: Adapted from Lysons and Farrington (2020)

Data Collection
Pre-Advanced Global Outsourcing OPEX: For OPEX data, a rolling 12-month historical data (June 2023 – May 2024) from the case company prior to implementing RFI, RFP, and eRA in June 2024 was collected. This baseline data of existing local vendors (Vendor 1, Vendor 2, Vendor 3, Vendor 4, and Vendor 5) showed the NOC costs before outsourcing techniques were applied.

Post Advanced Global Outsourcing OPEX: NOC OPEX data were collected after the RFI, RFP, and eRA implementation. This will allow for an analysis of how NOC OPEX changed after each outsourcing stage was implemented.

RFI Data: The initial pricing estimates received from the final five vendors during the RFI stage (June 2024) were collected. This data reflected the cost range provided by potential vendors based on general requirements for NOC services**.**

RFP Data: The more detailed pricing proposals received from the final vendors during the RFP stage (July to September 2024) were collected. These proposals contained specific pricing for NOC services, service level agreements (SLAs), and other negotiated terms.

eRA Data: The final, agreed pricing at the eRA stage (October to December 2024) was collected. This included the pricing of the final five vendors after the eRA negotiations.

Table 2: Historical OPEX Data

OPCO/ Vendor OPEX Drivers	Vendor 1 Ghana	Vendor 2 Uganda	Vendor 3 Benin	Vendor 4 Ivory Coast	Vendor 5 Liberia	Historical Baseline (12 months Data)
Resource Costs (RCS)	$1,300,000	$750,000	$650,000	$450,000	$800,000	$3,950,000
Facilities Costs (FACI)	$480,000	$450,000	$360,000	$420,000	$330,000	$2,040,000
Tools Costs (HW/SW-TOOL)	$400,000	$270,000	$180,000	$270,000	$160,000	$1,280,000
Operation Costs (OPR)	$1,700,000	$700,000	$460,000	$510,000	$360,000	$3,730,000
Total Cost per OPCO	$3,880,000	$2,170,000	$1,650,000	$1,650,000	$1,650,000	**$11,000,000**

Source: Case Company (2024)

The total baseline cost for NOC services across the five operating companies (OPCOs) serviced by related existing vendors (Vendor 1, Vendor 2, Vendor 3, Vendor 4, Vendor 5) for the rolling 12-month period from June 2023 to May 2024 was $11,000,000 as reported in this table. This 11 M USD is the as historical baseline.

Resource Costs: Ghana reported the highest resource cost at $1,300,000, while Ivory Coast had the lowest at $450,000. The cumulative expenditure on resources across all operating companies totaled $3,950,000.

Facilities Costs: The highest facility cost was recorded in Ghana at $480,000, whereas Liberia had the lowest at $330,000, resulting in a combined total of $2,040,000.

Tools Costs: Overall expenditure on tools across the five operating companies reached $1,280,000, with Ghana incurring the highest cost at $400,000.
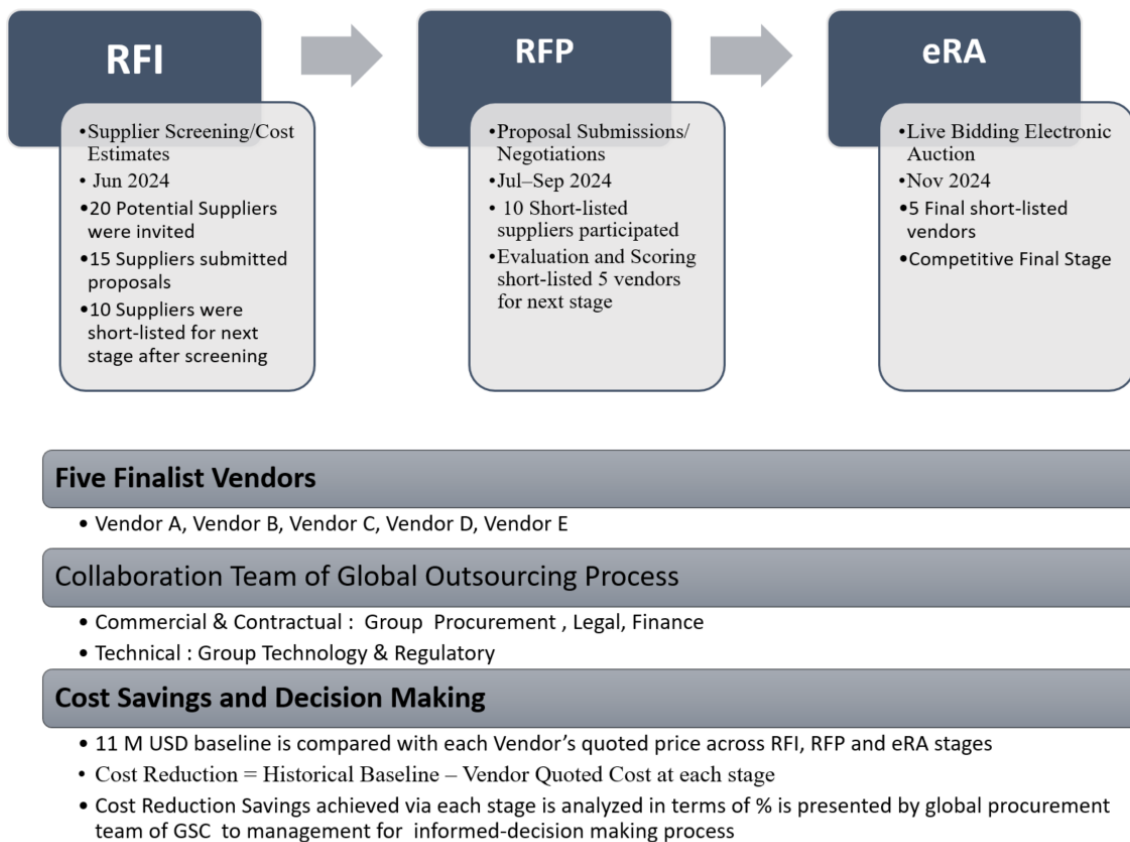
Operational Costs: Ghana had the greatest operational expenditure, at $1,700,000, while Liberia had the lowest, at $360,000, bringing the total to $3,730,000.

The total baseline cost of $11,000,000 would then be compared with the total cost obtained from stages of the RFI, RFP, and eRA to analyze the impact of OPEX cost reduction.

Overview of Advanced Global Outsourcing Process
Throughout the procurement process from June to December 2024, Advanced Global Outsourcing techniques, including Request for Information (RFI), Request for Proposal (RFP), and Electronic Reverse Auction (eRA), were applied strategically and step-by-step. These techniques were applied in a structured, phased manner to ensure the most cost-efficient and transparent selection of optimal suppliers. The sourcing initiative followed a structured, three-stage process—**RFI, RFP, and eRA**—executed between June and November 2024 (Figure 6).

Figure 6: Advanced Global Outsourcing Process

RFI	RFP	eRA
• Supplier Screening/Cost Estimates • Jun 2024 • 20 Potential Suppliers were invited • 15 Suppliers submitted proposals • 10 Suppliers were short-listed for next stage after screening	• Proposal Submissions/ Negotiations • Jul–Sep 2024 • 10 Short-listed suppliers participated • Evaluation and Scoring short-listed 5 vendors for next stage	• Live Bidding Electronic Auction • Nov 2024 • 5 Final short-listed vendors • Competitive Final Stage

Five Finalist Vendors
- Vendor A, Vendor B, Vendor C, Vendor D, Vendor E

Collaboration Team of Global Outsourcing Process
- Commercial & Contractual : Group Procurement , Legal, Finance
- Technical : Group Technology & Regulatory

Cost Savings and Decision Making
- 11 M USD baseline is compared with each Vendor's quoted price across RFI, RFP and eRA stages
- Cost Reduction = Historical Baseline – Vendor Quoted Cost at each stage
- Cost Reduction Savings achieved via each stage is analyzed in terms of % is presented by global procurement team of GSC to management for informed-decision making process

The **RFI phase** involved supplier screening and cost estimates from 20 invited vendors, resulting in 10 shortlisted candidates. During the **RFP phase**, detailed technical and commercial proposals were evaluated, narrowing the pool to five finalist vendors (Vendor A, Vendor B, Vendor C, Vendor D, Vendor E). The final **eRA stage** featured a live electronic auction among these five vendors to drive competitive pricing. A one-day live

Electronic Reverse Auction (eRA) was held, where the shortlisted vendors submitted best and final offers anonymously. The sourcing process was jointly led by a cross-functional team from procurement, legal, finance, technology, and regulatory units. Each vendor's quoted costs at every stage were benchmarked against an $11 million historical baseline, and percentage cost reductions were analyzed by the team of case company to inform final decision-making. A comparative cost analysis across the three sourcing stages—RFI, RFP, and eRA—revealed significant reductions in projected NOC service expenditures.

During the **RFI phase**, vendor bids ranged from **$8.57M to $12.38M**, with Vendor B offering the lowest total cost. Key cost drivers varied: Vendor B had the lowest resource and operational costs, while Vendor D recorded the highest across most categories (Table 3).

Table 3: RFI Cost Summary Table

GROUP NETWORK OPERATING CENTER [NOC] SERVICES		RFI PRICING (USD)				
CATEGORY CODE	CATEGORY DESCRIPTION	VENDOR A	VENDOR B	VENDOR C	VENDOR D	VENDOR E
	PRELIMINARIES	Sub-total	Sub-total	Sub-total	Sub-total	Sub-total
RCS	Resource Cost	2,005,376.00	1,413,925.00	1,764,875.00	2,330,650.20	2,098,787.90
FACI	Facilities Cost	572,358.00	1,348,550.27	1,151,274.42	1,763,515.42	1,304,003.00
SW-TOOL	Tools Cost	2,010,298.00	1,525,834.00	1,247,385.00	1,949,562.90	1,774,029.50
OPR	Operation Cost	6,900,355.00	4,281,737.00	5,235,679.00	6,334,544.28	5,451,836.86
		11,488,387.00	**8,570,046.27**	**9,399,213.42**	**12,378,272.80**	**10,628,657.26**

In the **RFP stage**, overall pricing became more competitive, with bids narrowing between **$6.53M and $9.06M**. Vendor E emerged as the lowest bidder, driven by cost efficiencies in operations and tools while resource and facility costs remained highest with Vendor D (Table 4).

Table 4: RFP Cost Summary Table

GROUP NETWORK OPERATING CENTER [NOC] SERVICES		RFP PRICING (USD)				
CATEGORY CODE	CATEGORY DESCRIPTION	VENDOR A	VENDOR B	VENDOR C	VENDOR D	VENDOR E
	PRELIMINARIES	Sub-total	Sub-total	Sub-total	Sub-total	Sub-total
RCS	Resource Cost	1,605,376.00	1,313,925.00	1,664,875.00	2,330,650.20	1,498,787.90
FACI	Facilities Cost	472,358.00	1,348,550.27	1,151,274.42	1,763,515.42	1,304,003.00
SW-TOOL	Tools Cost	1,510,298.00	1,325,834.00	1,247,385.00	1,949,562.90	1,774,029.50
OPR	Operation Cost	3,900,355.00	2,981,737.00	4,235,679.00	3,014,544.28	1,951,836.86
		7,488,387	**6,970,046**	**8,299,213**	**9,058,273**	**6,528,657**

The **eRA phase** yielded the most aggressive pricing, with Vendor E maintaining the lowest bid at **$4.99M** and Vendor D still presenting the highest at **$7.07M**. The live bidding environment incentivized vendors A, B, and C to revise their offers downward, showcasing the effectiveness of eRA in delivering final cost savings through competitive tension (Table 5).

Table 5: eRA Cost Summary Table

GROUP NETWORK OPERATING CENTER [NOC] SERVICES		eRA PRICING (USD)				
CATEGORY CODE	CATEGORY DESCRIPTION	VENDOR A	VENDOR B	VENDOR C	VENDOR D	VENDOR E
PRELIMINARIES		Sub-total	Sub-total	Sub-total	Sub-total	Sub-total
RCS	Resource Cost	1,300,354.56	1,077,418.50	1,165,412.50	1,817,907.16	1,146,572.74
FACI	Facilities Cost	382,609.98	1,105,811.22	805,892.09	1,375,542.03	997,562.30
SW-TOOL	Tools Cost	1,223,341.38	1,087,183.88	873,169.50	1,520,659.06	1,357,132.57
OPR	Operation Cost	3,159,287.55	2,445,024.34	2,964,975.30	2,351,344.54	1,493,155.20
		6,065,593	5,715,438	5,809,449	7,065,453	4,994,423

DATA ANALYSIS AND FINDINGS

Following the data collection, the dataset was applied to analytical models to examine the relationship and trends (Table 6).

Table 6: Dataset Table for ANOVA

Vendor	Historical Baseline	RFI	RFP	eRA
Vendor A	11,000,000	11,488,387	7,488,387	6,065,593
Vendor B	11,000,000	8,570,046	6,970,046	5,715,438
Vendor C	11,000,000	9,399,213	8,299,213	5,809,449
Vendor D	11,000,000	12,378,273	9,058,273	7,065,453
Vendor E	11,000,000	10,628,657	6,528,657	4,994,423

A Single-Factor ANOVA test was conducted in Excel to analyze the variance in cost reductions across RFI, RFP, and eRA. The result was to confirm that the differences in costs among the three sourcing methods were statistically significant ($p < 0.05$). Firstly, the pricing data of five competing vendors (Vendor A, Vendor B, Vendor C, Vendor D and Vendor E) in USD were tabulated below to run the single-factor ANOVA analysis.

Comparative pricing showed steady cost reductions: average total bids dropped from $10.5M in RFI to $7.6M in RFP, and down to $5.9M in the eRA phase. The structured application of Advanced Global Outsourcing strategies led to a measurable OPEX cost reduction, validating the effectiveness of multi-staged sourcing from RFI, RFP to eRA. ANOVA testing (Figure 7) confirmed that each progressive sourcing stage resulted in statistically meaningful cost differences ($p < 0.05$). Across five vendors (Vendor A, Vendor B, Vendor C, Vendor D, Vendor 5), average total costs declined from $10.5 million (RFI) to $7.6 million (RFP), and further to $5.9 million in the final eRA stage.

Figure 7: Comparative Analysis Using Anova: Single-Factor

SUMMARY OUTPUT

Regression Statistics		_in %_
Multiple R	0.869278475	
R Square	0.755645068	75.56%
Adjusted R Square	0.736848534	73.68%
Standard Error	1137851.478	
Observations	15	

ANOVA

	_df_	_SS_	_MS_	_F_	_ignificance F_
Regression	1	5.2E+13	5.2E+13	40.20129972	2.57E-05
Residual	13	1.68E+13	1.29E+12		
Total	14	6.89E+13			

	Coefficients	_andard Erro_	_t Stat_	_P-value_	_Lower 95%_	_Upper 95%_	_Lower 95.0%_	_Jpper 95.0%_
Intercept	(1,593,477.87)	777300.5	-2.05002	0.06109500	-3272734	85777.85329	-3272733.6	85777.85
Stage	2,281,422.00	359820.2	6.340449	0.00002574	1504078	3058766.349	1504077.7	3058766

*Findings of Consolidated Comparison for RFI, RFP, and eRA Stages*

Figure 8 compares the findings Cost in Million USD submitted by Vendor A, Vendor B, Vendor C, Vendor D, and Vendor D, respectively, in the procurement process for the Group Network Operating Center (NOC) Services. Each vendor's pricing across the stages of Request for Information (RFI), Request for Proposal (RFP), and Electronic Reverse Auction (eRA) are noted in colored dots, and the lines represent each stage of RFI, RFP, and eRA. Initially, the RFI stage presented the highest cost estimates, with Vendor A and Vendor D submitting the most expensive proposals at $11.49 million and $12.38 million, respectively. In the RFP stage, the observation was that vendors refined their bids in response to more precise project specifications. The final eRA stage further accelerated competitive pricing across all vendors. Vendor E emerged as the most cost-effective option, slashing its pricing from $10.63 million (RFI) to $6.53 million (RFP, and to $4.99 million (eRA).

Figure 8: Consolidated Data Comparison Chart
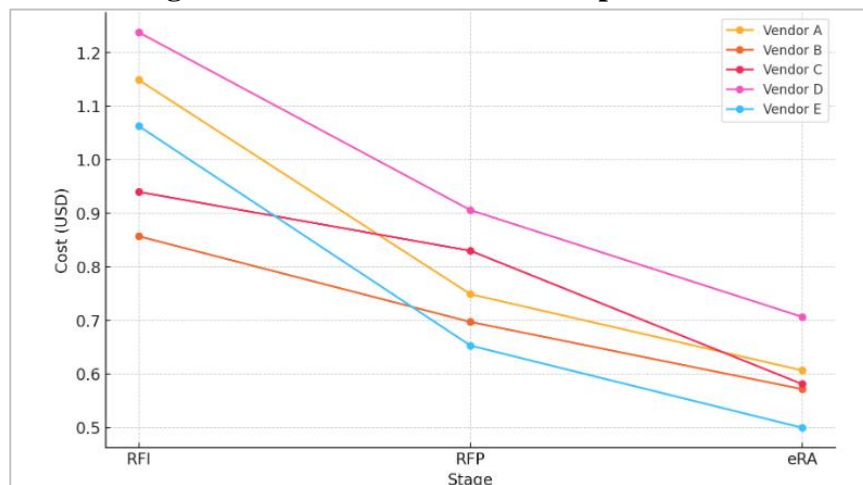
Figure 9: Boxplot of Total Vendor Cost by Sourcing Stage (RFI, RFP, eRA)
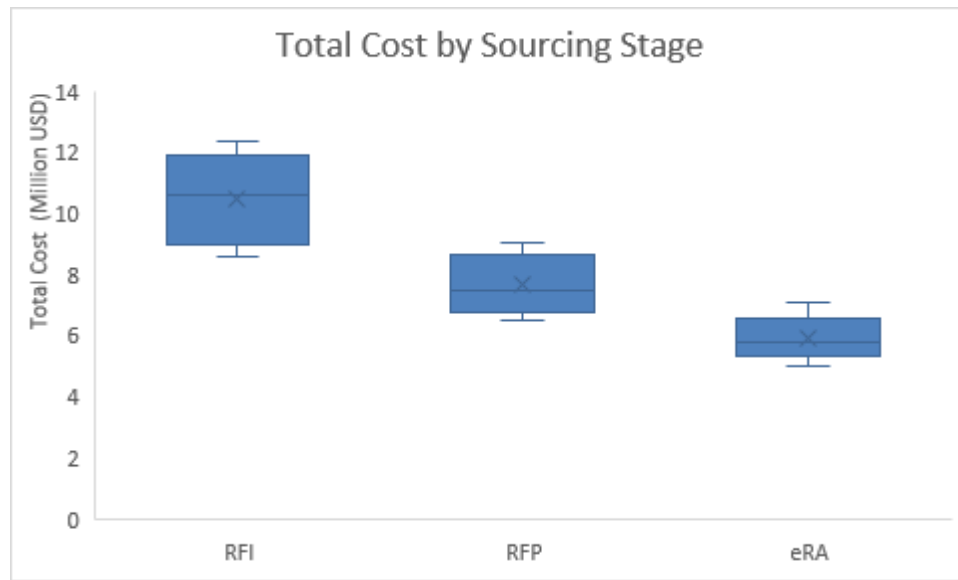
The boxplot illustrating total vendor costs across the three sourcing stages; RFI, RFP, and eRA—visually represents cost distribution and central tendency at each level (Figure 9). The plot reveals a clear downward trend in total costs as the sourcing process progresses from RFI to eRA. At the RFI stage, where preliminary cost estimates were collected, cost variability is relatively high, with some vendors quoting significantly higher than others. The median cost is also visibly higher compared to later stages. In the RFP stage, where proposals are more competitive with clearer scope of work, there is a moderate reduction in both the median and the spread of total costs, suggesting improved price competitiveness. The eRA stage shows the lowest median cost and a tighter interquartile range, indicating not only greater cost efficiency but also more consistent pricing among the five finalist vendors (Vendor A, Vendor B, Vendor C, Vendor D and Vendor E).

DISCUSSION OF RESULTS

The analysis of cost evolution in the procurement process for the Group Network Operating Center (NOC) Services revealed a noteworthy reduction in vendor pricing across the stages of Request for Information (RFI), Request for Proposal (RFP), and Electronic Reverse Auction (eRA). The historical cost baseline from previous financial years was significantly higher than the final negotiated prices through eRA, confirming that advanced sourcing practices successfully reduced the operational expenditures (OPEX) cost of NOC Services, as shown in Figure 10.

The bar chart visually compares the historical NOC OPEX Cost (As-Is) with vendor pricing across three Advanced Global Outsourcing stages—RFI, RFP, and eRA—for five vendors, Vendor A, Vendor B, Vendor C, Vendor D, and Vendor E respectively). The historical baseline OPEX cost of $11 million is benchmarked with each vendor's pricing across the

three stages. During the RFI stage, prices varied drastically, with Vendor D offering the highest cost at $12.38 million and Vendor B the lowest at $8.57 million. Vendor A and Vendor D submitted the most expensive proposals at $11.49 million and $12.38 million, respectively. In the RFP stage, all vendors demonstrated significant cost reductions, with Vendor B offering the most competitive rate at $6.97 million. The analysis of cost data from the three sourcing stages—RFI, RFP, and eRA—indicates significant reductions in NOC operational expenditures.

Figure 10: Historical Baseline vs Cost Reductions
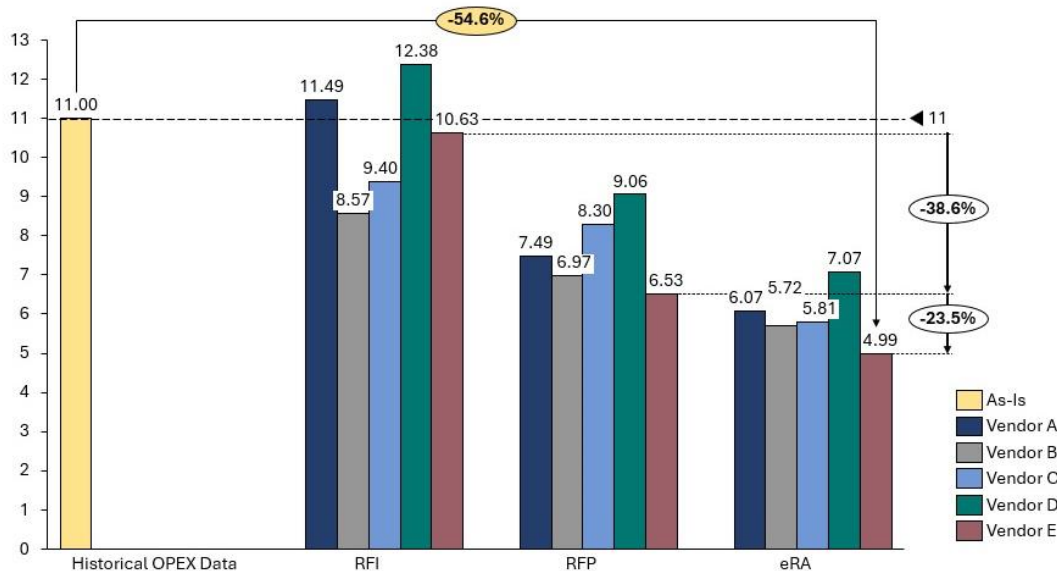
By the eRA stage, the reductions became even more aggressive. Vendor E offered the lowest cost at $4.99 million—representing a 54.6% reduction from the historical OPEX of 11 million. Vendor E motivated a 38.6% reduction from baseline to eRA and a 23.5% improvement from the RFP to eRA stages. Similarly, Vendor C demonstrated impressive adaptability, significantly reducing the eRA stage under competitive pressure. These pricing trends indicated the pivotal role of the eRA in optimizing costs, with Vendor E presenting the most cost-effective offer. Overall, the Figure illustrates each vendor's competitive behavior, leading to a progressive decline in cost across sourcing stages. This reinforces the effectiveness of Advanced Global Outsourcing methods in achieving operational expenditure OPEX cost savings. Notably, Vendor E provided the most cost-effective offer in the eRA stage, resulting in a final bid of $4.99 million—over 50% below the historical cost baseline. This cost improvement did not compromise quality, as SLAs and performance metrics were also embedded in the evaluated contracts.

CONCLUSIONS AND RECOMMENDATIONS

This study demonstrates that Advanced Global Outsourcing strategies, executed through a structured sequence of RFI, RFP, and eRA, can significantly reduce the operating expenditures (OPEX) associated with Network Operation Center (NOC) services in the

telecom sector. By applying a Total Cost of Ownership (TCO) lens to evaluate cost components—resources, tools, facilities, and operations - the research highlights how multi-staged sourcing creates financial and operational value. The results confirmed that Electronic Reverse Auctions (eRA) are particularly effective in achieving final cost reductions, while RFI and RFP phases are essential for pre-qualification and alignment.

The success of this model in the African telecom context suggests its applicability in other emerging markets where procurement transparency and cost efficiency are priorities. From a managerial perspective, this study underscores the importance of integrating performance metrics and service-level agreements (SLAs) into procurement processes. Strategic sourcing decisions should consider both immediate cost savings and long-term sustainability. By embracing digital tools and structured frameworks, sourcing leaders can optimize vendor performance, reduce risks, and contribute to broader organizational goals.

However, this study has several limitations:
- The dataset is limited to five vendors within a telecom context, which restricts the generalizability of the findings. Expanding the sample to include more vendors and diverse sourcing categories would enhance statistical validity and applicability.
- The research focuses exclusively on NOC outsourcing in the African telecom sector. As such, the results may not be transferable to other industries or regions with different sourcing environments and cost structures.
- The analysis centers primarily on cost reduction, without considering other value drivers such as service quality, vendor performance, or risk mitigation.

Future research could benefit from expanding the scope of this analysis in several meaningful directions. Firstly, replicating the study in telecom markets beyond Africa—such as Asia or Europe—would allow for a comparative analysis across different regulatory, economic, and supplier environments. This could reveal geographical variations in the effectiveness of global sourcing strategies and validate the findings on a broader scale with a more diverse set of vendors. Secondly, while this study focused on cost data, future research should incorporate non-financial key performance indicators (KPIs) such as service quality, response time, time to contract, and post-outsourcing vendor performance. These metrics would help assess the comprehensive value delivered by vendors and enable a multi-dimensional understanding of sourcing outcomes beyond OPEX reduction alone.

Additionally, the role of Service Level Agreements (SLAs) should be a central consideration in future studies especially service agreement as Network Operating Center (NOC) services in telecom. SLAs are critical control instruments in outsourcing arrangements, especially in telecom operations where service continuity and performance benchmarks are essential. Including SLAs in future research—particularly during the RFP and eRA stages—would enable a balanced assessment of cost versus performance. This would allow future researchers to examine how performance guarantees, penalty clauses, and accountability frameworks contribute to both risk mitigation and long-term value realization. Furthermore, the integration of SLAs into sourcing evaluations could help

organizations to avoid the consequences of selecting the lowest-cost vendor at the expense of quality or reliability. Lastly, future studies should explore how supplier relationship management (SRM) and contract governance mechanisms support the sustainability of procurement benefits achieved through Advanced Global Outsourcing strategies. A longitudinal approach to such research could provide insights into how these frameworks influence vendor compliance, innovation, and long-term OPEX optimization in competitive industries as Telecom and other service industries.

REFERENCES

A.T. Kearney. (2017). *The purchasing chessboard* (3rd ed.). A.T. Kearney.

Blaha, D. A. (2002). *Designing a strategic sourcing process for low volume, high technology products* (Master's thesis, Massachusetts Institute of Technology). Massachusetts Institute of Technology. http://hdl.handle.net/1721.1/34720

Clemm, A. (2006). *Network management fundamentals*. Cisco Press.

Dovgalenko, S. (2020). *The technology procurement handbook: A practical guide for digital buying* (1st ed.). Kogan Page.

GSMA. (2013). *Green power for mobile: Best practice operations guide.* GSMA. Kakabadse, A., & Kakabadse, N. (2005). Outsourcing: Current and future trends. *Thunderbird International Business Review, 47*(2), 183–204.

Lacity, M. C., & Willcocks, L. P. (2017). *A manager's guide to IT outsourcing*. Palgrave Macmillan.

Lysons, K., & Farrington, B. (2020). ***Purchasing and supply chain management*** (10th ed.). Cengage Learning.

Mathews, A. (2022). *Supply chain resilience by strategic sourcing: A case study* (Master's thesis, Rochester Institute of Technology). RIT Scholar Works. https://scholarworks.rit.edu

MTN Consulting, LLC. (2023, June). *Telco OPEX Analyzer: 2016–2022 trends***.** MTN Consulting, LLC. Retrieved from https://www.marketresearch.com/MTN-Consulting-LLC-v4243/Telco-Opex-Analyzer-2016-22

Omdia. (2024). *Global telecom OPEX taxonomy*. https://omdia.tech.informa.com

Quiñonez, C. G. (2013). *Development of a criteria-based strategic sourcing model* (Master's thesis, Massachusetts Institute of Technology, Sloan School of Management and Engineering Systems Division). Massachusetts Institute of Technology. http://hdl.handle.net/1721.1/81015