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Long Term Impact of Information and Communication Technology on Corridors Performance

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Abstract
Transport corridors play a crucial role in facilitating regional trade and economic integration. The Central Corridor, connecting the Port of Dar es Salaam to several landlocked countries, has increasingly adopted Information and Communication Technology (ICT) solutions to enhance logistics efficiency, trade facilitation, and sustainability. This study examines the long-term impact of ICT on corridor performance using a mixed-methods approach. Qualitative analysis, conducted through NVivo, explores policy frameworks and stakeholder perspectives, while quantitative assessment, using Structural Equation Modeling (SEM), evaluates ICT's effects on logistics efficiency, economic growth, and trade facilitation. Findings indicate that ICT adoption significantly improves corridor performance by reducing transit delays, enhancing cargo tracking, and streamlining customs clearance. However, challenges such as regulatory misalignment, infrastructure disparities, and cybersecurity risks hinder full ICT integration. The study highlights the need for continuous investment in digital infrastructure, policy harmonization, and stakeholder collaboration to maximize ICT's long-term benefits. These insights contribute to the broader discourse on digital transformation in transport corridors and provide policy recommendations for sustainable corridor management.

Keywords: *Transport corridors, ICT adoption, logistics efficiency, trade facilitation, digital infrastructure, economic growth, regulatory alignment, cybersecurity, structural equation modeling (SEM)*

1. Introduction

Transport corridors are critical to regional trade, economic development, and industrial connectivity. These corridors facilitate the movement of goods, services, and people across borders, linking production centers to markets and fostering regional integration. They include a combination of road, rail, maritime, and inland waterways, playing a pivotal role in enabling efficient logistics and reducing trade costs. In Africa, corridors such as the Northern Corridor and the Central Corridor serve as vital conduits for landlocked nations, ensuring access to international markets. However, despite their economic significance, these corridors often suffer from inefficiencies, including congestion, delays, and high operational costs (Flory & Nyaronga, 2025). Addressing these inefficiencies requires innovative solutions, with Information and Communication Technology (ICT) emerging as a key enabler of improved corridor performance.

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Over the past two decades, ICT has transformed global trade and logistics, introducing digital solutions that enhance the efficiency, transparency, and reliability of supply chains. The integration of ICT in transport corridors has led to the development of smart logistics systems, real-time cargo tracking, electronic customs clearance, and automated transport monitoring, all of which contribute to streamlined trade processes (Clausen et al., 2012). Digital freight management systems, for instance, allow transport operators to monitor cargo movement in real time, minimizing losses and optimizing delivery schedules. Similarly, electronic single windows and -based trade facilitation platforms reduce paperwork, expedite border clearance, and improve overall efficiency in supply chain management (Hunke & Prause, 2013). These advancements have spurred the evolution of "smart corridors," where digital infrastructure facilitates seamless trade flows, mitigates risks, and supports green transport initiatives (Sumbal et al., 2024).

Despite the clear benefits of ICT adoption, several challenges continue to hinder the full realization of its potential in corridor management. Infrastructure disparities, inadequate investment in digital systems, and regulatory misalignment often create bottlenecks that limit efficiency gains (Lawal et al., 2025). Moreover, cyber security concerns and data privacy issues pose risks to digital trade facilitation systems, particularly in regions where ICT regulations are still evolving. In Africa, many transport corridors still rely on manual documentation processes and fragmented ICT systems, leading to inconsistencies in cargo tracking, delays in customs processing, and increased trade costs. Studies show that while the adoption of ICT has improved logistics performance in certain corridors, long-term sustainability remains uncertain, particularly in developing economies with weaker institutional frameworks (Panagakos & Psaraftis, 2017).

The Central Corridor, which connects the Port of Dar es Salaam in Tanzania to landlocked countries such as Rwanda, Burundi, Uganda, Malawi, Zambia, and the Democratic Republic of Congo (DRC), presents a unique case for studying the role of ICT in corridor management. As one of Africa's most significant trade routes, the corridor has witnessed several ICT-driven interventions aimed at enhancing logistics efficiency and reducing non-tariff barriers. Digital customs platforms, automated weighbridge systems, and electronic cargo tracking have been introduced to minimize transit delays and improve cross-border coordination (Flory & Nyaronga, 2025). However, the effectiveness of these interventions varies, with persistent challenges such as

inconsistent regulatory enforcement, infrastructure bottlenecks, and limited interoperability between digital platforms continuing to affect corridor performance. Understanding the long-term impact of ICT within this context is essential for designing sustainable digital interventions that enhance trade facilitation and economic integration.

Existing research on ICT and corridor performance has predominantly focused on short-term efficiency gains, such as reductions in clearance times and operational costs. However, there remains a critical knowledge gap in assessing the long-term impact of ICT on transport corridor sustainability, economic growth, and overall performance. While studies have examined the role of digital technology adoption in procurement and logistics (Jantaroa & Badira, 2024), there is limited empirical evidence on how ICT investments influence corridor operations over extended periods. Furthermore, the impact of emerging technologies such as artificial intelligence (AI), the Internet of Things (IoT), and big data analytics on trade corridor performance remains an underexplored area in the literature (Wungcharoen, 2022).

This study aims to evaluate the long-term effects of ICT adoption on corridor performance, with a specific focus on logistics efficiency, economic growth, and sustainability.

2. Literature Review

2.1 Theoretical Framework

The long-term impact of Information and Communication Technology (ICT) on corridor performance can be effectively analyzed using two key theories: Diffusion of Innovation (DOI) Theory and Stakeholder Theory. These theories provide a structured lens to examine how ICT adoption progresses over time and how different actors influence its sustainability. DOI Theory, introduced by Everett Rogers (1962), explains the process of technology adoption and diffusion, while Stakeholder Theory, developed by Edward Freeman (1984), highlights the roles, interests, and interactions of various stakeholders in shaping ICT implementation and long-term outcomes. Both theories complement each other in understanding the dynamics of ICT adoption in transport corridors. DOI Theory provides insight into how and why ICT adoption progresses at different rates among corridor users, while Stakeholder Theory emphasizes the long-term alignment and engagement of various actors in ensuring ICT success.

2.1.1 Diffusion of Innovation (DOI) Theory

The Diffusion of Innovation (DOI) Theory, formulated by Everett Rogers in 1962, describes how new technologies spread within a system. Rogers (2003) defines innovation diffusion as "the process by which an innovation is communicated through certain channels over time among members of a social system." The theory identifies five stages of adoption; Knowledge, Persuasion, Decision, Implementation and Confirmation.

Additionally, DOI Theory classifies adopters into five groups: Innovators, Early Adopters, Early Majority, Late Majority, and Laggards. The rate at which ICT adoption occurs in corridors depends on factors such as perceived benefits, ease of use, compatibility, trainability, and observability (Rogers, 2003).

Over the long term, the adoption of ICT within transport corridors follows different trajectories for different stakeholders. Innovators such as large logistics firms are the first to integrate technologies like block chain for customs clearance and AI-powered cargo tracking, leading to immediate efficiency gains. Early adopters, such as progressive transport agencies, soon follow by incorporating IoT-based fleet monitoring and automated documentation systems. The early and late majority, including regional SMEs and border control agencies, adopt ICT gradually, often influenced by industry standards and regulatory pressures. However, laggards such as small informal traders and traditional transport operators dopt ICT only when digitalization becomes unavoidable (Rogers, 2003; Wungcharoen, 2022).

Empirical studies confirm that ICT adoption in corridors is a long-term process that spans decades. For example, research by Hunke and Prause (2013) found that green corridor projects in Europe saw gradual ICT integration, with full implementation occurring only after policy mandates and incentives were introduced. Similarly, Sumbal et al. (2024) argue that ICT-driven logistics performance systems take 5–10 years to fully optimize corridor efficiency, as businesses must restructure workflows, train employees, and integrate new digital systems.

Furthermore, ICT adoption is not static it evolves with advancements in cloud computing, AI, and 5G connectivity. For instance, Flory and Nyaronga (2025) highlight how the Central Corridor's

transition from GPS-based tracking to AI-driven predictive logistics significantly improved trade efficiency over a decade. Without continuous investment and technological adaptation, previously adopted ICT solutions become obsolete, reducing corridor competitiveness.

DOI Theory is valuable for analyzing the long-term adoption trends of ICT in corridors, as it highlights the phases of adoption, the role of early adopters, and the eventual mainstreaming of technology. However, a key limitation of DOI Theory is its assumption that innovation adoption follows a linear progression. In reality, ICT adoption in transport corridors is influenced by external factors such as regulatory changes, economic disruptions, and infrastructure constraints (Panagakos & Psaraftis, 2017). Additionally, DOI Theory focuses on individual or organizational adoption but does not fully explain the broader structural and policy-level factors that shape ICT integration in transport corridors.

2.1.2 Stakeholder Theory

Stakeholder Theory, developed by Edward Freeman in 1984, argues that organizations and projects succeed when they effectively manage relationships with key stakeholders. Freeman (1984) defines stakeholders as "any group or individual who can affect or is affected by the achievement of an organization's objectives." The theory emphasizes that successful ICT adoption in transport corridors requires ongoing collaboration between governments, businesses, trade organizations, and local communities (Freeman, Harrison, & Zyglidopoulos, 2018).

ICT adoption in transport corridors involves multiple stakeholders with varying interests; Governments, Private sector firms, Regional trade organizations, Local communities and small traders,

Over the long term, stakeholder engagement evolves. Initially, governments and large corporations drive ICT investments, but as technology matures, collaborative governance between public and private sectors becomes essential for sustainability. Research by Panagakos and Psaraftis (2017) found that ICT projects in European corridors were most successful when government support was consistent and trade organizations played an active role in harmonizing policies. Conversely,

fragmented stakeholder coordination led to underutilization of ICT systems, financial losses, and inefficiencies (Lawal, Gidari-Wudil, & Adedeji, 2025).

Stakeholder Theory is useful for analyzing long-term ICT sustainability, as it highlights the importance of collaboration, regulatory alignment, and continuous investment. However, a weakness of the theory is its lack of predictive power it does not specify how stakeholders will interact over time or how conflicts may arise. Moreover, the theory assumes that stakeholder interests can be aligned, but in reality, power imbalances and competing priorities often slow ICT progress (Flory & Nyaronga, 2025).

2.2 Empirical Review

2.2.1 ICT and Logistics Efficiency in Transport Corridors

Logistics efficiency is a fundamental determinant of corridor performance, influencing transit times, operational costs, and supply chain reliability. ICT has been widely recognized for its role in optimizing logistics processes, reducing delays, and enhancing overall efficiency. Digital solutions such as electronic cargo tracking systems, automated weighbridge stations, and intelligent traffic management have been implemented in several corridors to improve freight movement and cross-border trade facilitation (Clausen et al., 2012). These technologies enable real-time monitoring of cargo, ensuring better coordination between transport operators, customs authorities, and logistics providers.

For instance, in the European transport corridor system, the implementation of smart logistics solutions has significantly reduced transit delays and improved supply chain visibility (Hunke & Prause, 2013). Similarly, in developing economies, the introduction of electronic cargo tracking systems has led to improved efficiency in trade corridors, reducing incidences of cargo theft and unauthorized detours (Sumbal et al., 2024). However, despite these advancements, disparities in ICT infrastructure and inconsistent digital adoption across corridor stakeholders continue to pose challenges. Studies indicate that while large-scale logistics firms benefit from digital solutions, small and medium enterprises (SMEs) often struggle with the high costs and technical complexities associated with ICT adoption (Jantaroa & Badira, 2024).

The Central Corridor has witnessed increased ICT integration through digital monitoring systems and automated checkpoints, yet inefficiencies such as congestion at border points and delays in cargo clearance remain prevalent (Flory & Nyaronga, 2025). The extent to which ICT can mitigate these inefficiencies in the long term remains a subject of debate, with scholars emphasizing the need for more empirical research on sustainable digital interventions in corridor logistics.

2.2.2 Digital Trade Facilitation and Corridor Performance

One of ICT's most significant contributions to transport corridors is its role in trade facilitation. The World Trade Organization (WTO) has identified digital trade facilitation as a key driver of cross-border trade efficiency, highlighting its potential to reduce transaction costs and improve customs processes (Panagakos & Psaraftis, 2017). Electronic single window (ESW) systems, blockchain-based trade documentation, and artificial intelligence-driven customs clearance have been instrumental in expediting border processing and minimizing bureaucratic delays.

Research on green corridors suggests that digitalization can significantly enhance trade efficiency by enabling paperless transactions, automated risk assessment, and digital compliance monitoring (Clausen et al., 2012). In regions such as Southeast Asia, ICT-driven trade facilitation measures have led to substantial improvements in corridor efficiency, with reductions in customs clearance times and increased transparency in supply chain operations (Wungcharoen, 2022).

Despite these benefits, challenges persist, particularly in the harmonization of digital trade policies across multiple jurisdictions. The lack of standardized ICT frameworks among corridor member states often leads to interoperability issues, undermining the effectiveness of digital trade facilitation measures (Lawal et al., 2025). In Africa, the implementation of digital customs platforms has faced setbacks due to inconsistent regulatory enforcement and limited capacity among border agencies. The Central Corridor, for example, has introduced automated customs clearance at key entry points, but technical inefficiencies and regulatory misalignment continue to hinder seamless trade flows (Flory & Nyaronga, 2025).

2.2.3 ICT, Economic Growth, and Corridor Development

The long-term economic impact of ICT adoption in transport corridors extends beyond logistics efficiency and trade facilitation. Studies indicate that ICT-driven corridor optimization contributes to economic growth by enhancing regional connectivity, attracting foreign investment, and promoting industrial expansion (Sumbal et al., 2024). The digitization of transport corridors fosters integration into global value chains, making trade routes more attractive to investors and logistics firms.

In Thailand's Eastern Economic Corridor, for instance, the deployment of digital infrastructure in procurement and logistics has led to significant improvements in industrial productivity and economic competitiveness (Jantaroa & Badira, 2024). Similar trends have been observed in European corridors, where smart transport networks have driven regional economic growth by increasing trade volumes and reducing supply chain disruptions (Panagakos & Psaraftis, 2017).

However, in developing economies, the relationship between ICT adoption and economic growth remains complex. While digital investments can enhance corridor efficiency, the long-term economic impact depends on factors such as policy consistency, infrastructure quality, and institutional capacity. The Central Corridor, despite its ICT interventions, continues to face economic constraints due to infrastructure deficits, inconsistent investment flows, and regulatory challenges (Flory & Nyaronga, 2025). Understanding how ICT can drive sustained economic growth in such contexts requires a more comprehensive analysis of long-term trends and policy dynamics.

2.2.4 Sustainability and Green Transport Corridors

Sustainability has become a central consideration in transport corridor development, with ICT playing a key role in advancing green transport initiatives. The concept of "green corridors" emphasizes environmentally friendly logistics solutions, such as fuel-efficient transportation, emissions monitoring, and smart mobility systems (Clausen et al., 2012). Digital technologies enable data-driven decision-making for reducing carbon footprints, optimizing route planning, and enhancing energy efficiency in freight operations.

Research on European green corridors has shown that ICT applications in transport monitoring can lead to significant reductions in greenhouse gas emissions, improving overall corridor sustainability (Hunke & Prause, 2013). In Africa, however, the integration of ICT in green corridor development remains in its early stages. While some initiatives have focused on electronic tolling systems and intelligent transport networks, widespread adoption is hindered by financial constraints and policy gaps (Lawal et al., 2025).

The Central Corridor has the potential to incorporate ICT-driven sustainability measures, particularly in fuel consumption optimization and emissions tracking. However, the effectiveness of such initiatives depends on regional policy alignment and investment in green technologies. The long-term role of ICT in enabling sustainable corridor operations remains an area requiring further empirical investigation.

2.3 Research Gap

While existing literature provides valuable insights into ICT's role in corridor performance, several research gaps remain. First, most studies focus on short-term efficiency gains rather than the long-term impact of ICT on trade facilitation, economic growth, and sustainability. Second, there is limited research on the contextual challenges of ICT adoption in African transport corridors, particularly regarding policy harmonization, cybersecurity risks, and digital infrastructure disparities. Third, emerging technologies such as AI, IoT, and big data analytics have yet to be fully explored in the context of corridor optimization. Therefore, this study seeks to address these gaps by providing a comprehensive analysis of the long-term impact of ICT on corridor performance.

3. Methods

This study employs a mixed-methods approach, integrating qualitative and quantitative techniques to comprehensively assess the long-term impact of ICT on corridor performance. The qualitative component involves content analysis using NVivo, allowing for an in-depth examination of policy documents, trade reports, and academic literature related to ICT adoption in transport corridors. Studies such as Clausen, Geiger, and Behmer (2012) and Hunke and Prause (2013) highlight the necessity of qualitative approaches in analyzing ICT-driven transformations in logistics and trade

facilitation. In this study, key themes such as digital infrastructure development, regulatory frameworks, and stakeholder collaboration are extracted to understand ICT adoption patterns. Additionally, semi-structured interviews will be conducted with government officials, logistics operators, and trade organizations to gain expert insights into policy challenges and technological integration.

The quantitative component employs Structural Equation Modeling (SEM) to analyze the relationship between ICT adoption and corridor performance metrics such as logistics efficiency, trade volume, and cost reduction. This method is chosen due to its ability to examine complex causal relationships between multiple variables, as demonstrated by Sumbal et al. (2024) in their study on ICT-driven logistics performance. The study collected secondary data from trade facilitation agencies, customs authorities, and transport ministries, aligning with previous research by Flory and Nyaronga (2025) on the economic effects of transport corridors. Key indicators such as cargo transit time, border processing efficiency, and ICT investment levels will be modeled to assess the long-term effectiveness of digital interventions in corridor operations.

Through combining NVivo for qualitative analysis and AMOS for quantitative modeling, this study ensures a holistic assessment of ICT's impact on transport corridors over time. The integration of both methods allows for triangulation, enhancing the validity and reliability of findings. Prior studies, including Panagakos and Psaraftis (2017) and Lawal, Gidari-Wudil, and Adedeji (2025), emphasize the importance of multi-method research in transport and logistics studies, as ICT adoption is influenced by technological, economic, and governance factors. This approach will provide a comprehensive understanding of how ICT transforms corridor efficiency and competitiveness in the long run.

4. Results and Discussion

4.1 Confirmatory Analysis Results

IBM SPSS Amos 23 was utilized to evaluate the measurement model fitness for the ICT construct, which consisted of five factors: ICT1, ICT2, ICT3, ICT4, and ICT5, as detailed in Table 4.8. During the initial stage of confirmatory factor analysis (CFA), the model fit indices were calculated to determine the extent to which the proposed model aligned with the observed data. The fit indices

for this initial analysis were as follows: CMIN/DF = 3.754, GFI = 0.962, AGFI = 0.921, CFI = 0.948, and RMSEA = 0.089. While some indices were close to acceptable thresholds, the overall results indicated poor model fit when compared to the benchmark levels specified in Table 4.8. Consequently, further refinement and modification of the model were necessary to achieve acceptable fit indices and improve the validity of the construct.

To address the poor model fit, the refinement process was guided by the recommendations of Schumacker and Lomax (2004), who emphasize that items with high covariance and high regression weights in the modification indices (MI) should be prioritized for deletion to enhance model performance. Additionally, items with standardized regression weights (SRW) below the critical threshold of 0.5 were flagged as candidates for removal. This step ensured that only those items contributing meaningfully to the construct were retained in the final model.

The refinement process began with a thorough review of the AMOS output to identify specific problematic items. One such item was e5↔e1, which exhibited a modification index (MI) of 9.421 and a parameter change of 0.091 under the ICT1 factor. As detailed in Table 4.20, this item was subsequently removed to address its negative impact on the model fit.

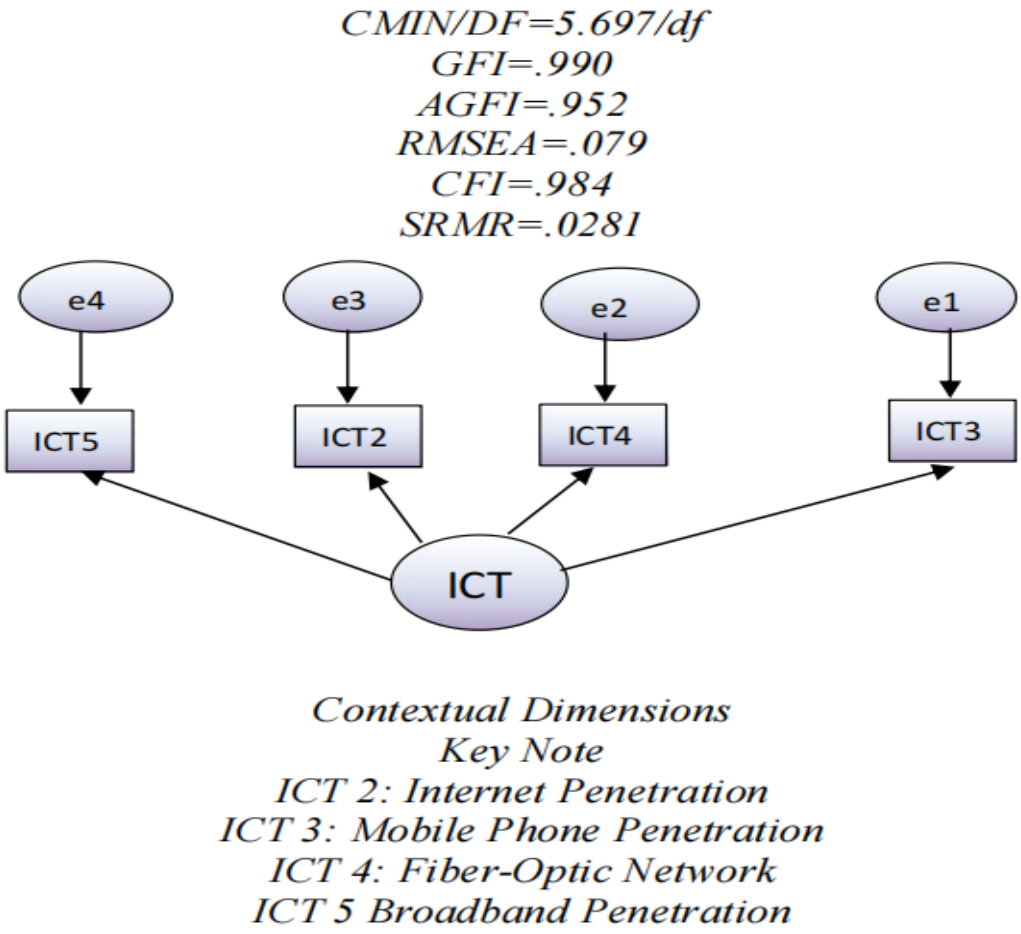
Table 4.1: Covariance's Second Run for RA

			M.I.	Par Change
e5	<-->	e1	7.981	.084
e5	<-->	e3	8.546	.063

Source: Researcher, (2024)

After the removal of the problematic item, the results of the confirmatory factor analysis (CFA) conducted using IBM SPSS Amos 23 indicated a substantial improvement in the model's fit. The refined model met and exceeded the standard criteria for acceptable fit indices, confirming the validity and reliability of the retained items in representing the construct. Specifically, the fit indices for the revised model were as follows: CMIN/DF = 0.342, GFI = 0.998, AGFI = 0.994, CFI = 1.000, RMSEA = 0.000, and SRMR = 0.0274. These results reflect a well-fitting model, demonstrating that the modifications made during the refinement process were effective.

Figure 4.1 visually depicts the finalized model, illustrating the relationships between the latent variable and the retained items. The diagram highlights the improved structure and clarity achieved after the refinement process. The results confirm that the modified model falls well within the acceptance framework, providing a robust foundation for subsequent analyses and interpretation.



4.2 Findings and Discussion

The findings reveal a significant and positive relationship between ICT adoption and corridor performance, with a standardized path coefficient (γ) of 0.273. This indicates that corridors that effectively integrate ICT solutions, such as digital tracking systems, electronic logistics platforms, and automated processes, achieve better performance outcomes. This finding aligns with the work

of Al-Omoush et al. (2020), who emphasized that a standardized path coefficient greater than 0.2 is considered statistically significant and is crucial in discussions of causal relationships.

The item-level analysis provides further validation of this relationship. For instance, the measurement of digital tracking efficiency (ICT2) demonstrated an estimated coefficient of 2.189 with a standard error of 0.472, a critical ratio of 4.638, and a p-value of less than 0.001, yielding a strong standardized estimate of 0.693. Similarly, the measurement of real-time data access (ICT3) showed an estimated coefficient of 2.302 with a standardized estimate of 0.705, reinforcing the strong impact of ICT accessibility on corridor performance. Information integration (ICT5), though a reference point, yielded a standardized estimate of 0.371, indicating a moderate relationship.

These results demonstrate that ICT adoption plays a crucial role in enhancing the performance of logistics corridors. By focusing on real-time tracking, digital platforms, and efficient information sharing, corridors improve not only their operational outcomes but also their competitive standing in the market. For example, digital tracking enhances the efficiency of goods movement, reduces delays, and improves overall service delivery, thereby increasing reliability, cost-effectiveness, and user satisfaction.

4.3 Qualitative Analysis

4.3.1 What is long term impact of ICT on corridors Performance?

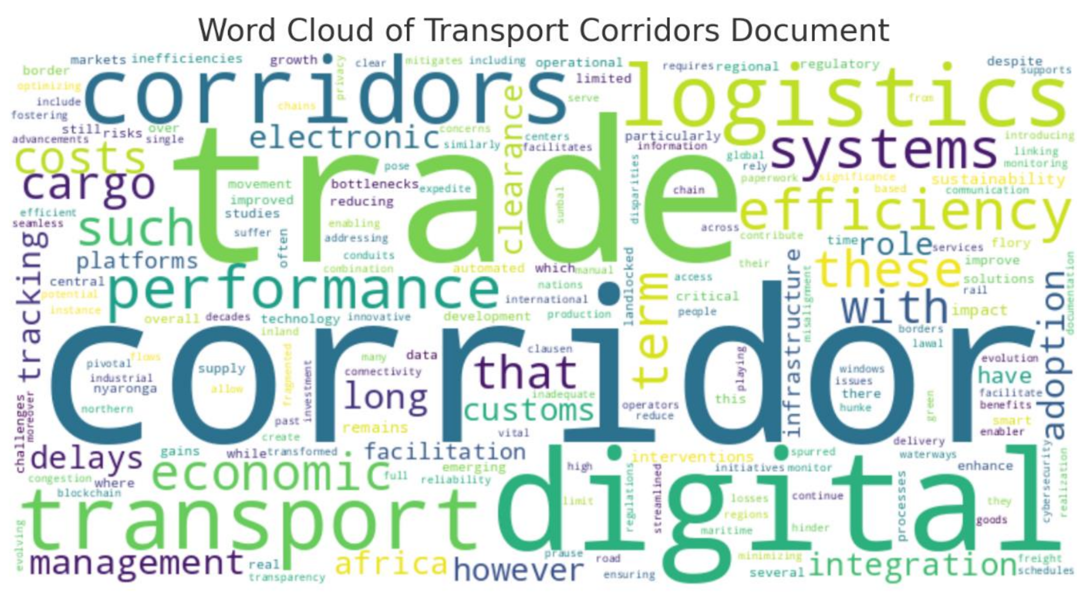
During the interview with the transport agent, he explained his views as quoted below:

"The long-term impact of Information and Communication Technology (ICT) on corridor performance is transformative, particularly in enhancing efficiency, reducing costs, and improving trade facilitation. ICT enables automation in logistics, real-time tracking, and smart traffic management, which collectively reduce transit delays and operational expenses. Technologies such as Electronic Data Interchange (EDI) and blockchain-based trade documentation facilitate seamless cross-border transactions, minimizing bureaucratic bottlenecks. Additionally, the integration of Internet of Things (IoT) devices and Artificial Intelligence (AI) in transport systems enhances route optimization, reduces fuel consumption, and

lowers carbon emissions. However, the effectiveness of ICT-driven corridor performance depends on adequate digital infrastructure, policy harmonization among transit countries, and the capacity of stakeholders to adopt and utilize digital tools effectively".

The Chief Operations Officer (COO), had these comments to say:

"Despite these advancements, challenges remain in achieving interoperability among different ICT systems across borders, especially in developing regions. The digital divide between well-connected urban centers and remote areas may create inefficiencies, hindering the full potential of ICT in logistics and trade facilitation. Additionally, cybersecurity threats pose risks to digital trade systems, necessitating strong regulatory frameworks and investment in cyber resilience. Case studies from corridors such as the Northern Corridor in East Africa show that e-customs platforms and cargo tracking systems have significantly reduced transit times, yet issues like inconsistent ICT adoption across member states persist. Therefore, while ICT offers immense potential for improving corridor performance in the long term, its success depends on sustained investments, stakeholder collaboration, and regulatory alignment to ensure seamless digital integration across trade routes"



Source: nVIVO: 12

4.3.2 Interpretation of the Word Cloud:

This word cloud highlights key terms associated with **long term impact of ICT on corridors performance.** The size of each word reflects its frequency and significance in the underlying text. Words like “ICT”, “corridor”, “logistics”, “efficiency”, “digital”, “trade”, and “performance” .stand out prominently, suggesting their central importance in the challenges and discussions surrounding the corridor.

5. Conclusions

The results of this study revealed a significant and positive correlation between ICT adoption and the performance of the Central Corridor. The confirmatory factor analysis (CFA) conducted using IBM SPSS Amos 23 initially indicated poor model fit, with indices such as CMIN/DF = 3.754, GFI = 0.962, AGFI = 0.921, CFI = 0.948, and RMSEA = 0.089, which did not meet the recommended thresholds. In response, the model underwent refinement by systematically eliminating problematic items based on modification indices (MI) and standardized regression weights (SRW). This process followed the recommendations of Schumacker and Lomax (2004) to enhance model validity and reliability.

Following these adjustments, the refined model demonstrated a significant improvement in model fit, with final indices of CMIN/DF = 0.342, GFI = 0.998, AGFI = 0.994, CFI = 1.000, RMSEA = 0.000, and SRMR = 0.0274. These values confirm an excellent model fit, particularly the RMSEA value of 0.000, which falls well below the commonly accepted threshold of 0.08, and the CFI value of 1.000, indicating that the revised model perfectly explains the observed covariance structure.
Consequently, this study concludes that ICT adoption has a positive and significant impact on the performance of the Central Corridor. Transport and logistics firms that leverage innovative digital technologies are more likely to achieve higher efficiency, regulatory compliance, and sustainable competitive advantage in the logistics sector.

5.1 Area for Further Studies

Future research should consider expanding the scope to include other major corridors in East Africa to provide a more comprehensive understanding of the impact of ICT on corridor performance. Additionally, further studies could explore the role of regulatory policies, financial

incentives, and digital infrastructure in facilitating or hindering ICT adoption in logistics operations.

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