https://doi.org/10.56279/orseaj.special.16

Wheels of Efficiency: Examining Key Determinants of Vehicle Fleet Management Efficiency in Tanzanian Public Higher Learning Institutions

Gerald Zachary Paga Tinali[1] and Samson Matungwa Lwiza[2]

Abstract

This study examines the key factors influencing vehicle fleet management efficiency in public higher learning institutions in Tanzania, specifically the roles of financial resources, regulatory frameworks, and technological use. Guided by the New Public Management (NPM) theory and Resource-Based View (RBV), the research employs a positivist philosophy with a deductive approach. Data was gathered through structured questionnaires from 111 respondents. Structural Equation Modelling (SEM) was utilised to analyse quantitative data, using SmartPLS 4 to estimate and validate both the measurement and structural models. Results indicate that financial resources and regulatory frameworks significantly improve fleet management efficiency, whereas technological use has a positive but statistically insignificant effect. The study highlights the critical role of financial and regulatory support in enhancing fleet operations. Although technology holds potential, its current contribution to fleet management is limited, underscoring the need for more advanced technology to unlock its full benefits.

Keywords: Financial Resources, Regulatory Frameworks, Technological Use, Vehicle Fleet Management Efficiency

Introduction

Efficient vehicle fleet management in the public sector is essential for optimising resource utilisation, enhancing safety, and minimising operational costs (Ampiah, 2018). Vehicle fleet management efficiency in public higher learning institutions has become a focal point for academic research, owing to its significant potential to optimise operations, reduce costs, and promote sustainability. Scholars have researched various factors that influence this efficiency, with a particular emphasis on technological integration (Jayapal *et al.,* 2023), operational strategies (Roy, 2022), and regulatory frameworks (Striepe *et al.,* 2024). The growing body of literature highlights the importance of using innovative approaches to fleet management to achieve these goals. Today, fleet management incorporates tracking, maintenance, driver oversight, fuel management, and advanced analytics to maximise efficiency (Zengwei *et al.,* 2018). A well-designed system integrates several key components that work together to maximise fleet performance and reduce costs (Ally, 2020). These components include vehicle tracking, maintenance management, driver management, fuel management, compliance and reporting, and the utilisation of advanced technology and data analytics (Ishaq & Cats, 2020). Vehicle fleet management efficiency is a critical aspect of operational success in public institutions, impacting cost savings, sustainability, optimising resource utilisation, and enhancing safety (Ampiah, 2018;

[1] University of Dar es salaam Business School, Tanzania
Email: tinali.gerald@udsm.ac.tz
[2] University of Dar es salaam Business School, Tanzania
Email: samlwiza6@gmail.com

Hidayat & Kinoro, 2023). The relationship between financial resources and vehicle fleet management in public higher learning institutions is complex (Chiparo *et al.,* 2022). This divergence highlights the need for a nuanced understanding of how financial management impacts fleet performance.

Previous studies have been conducted on factors influencing vehicle fleet management efficiency, such as technological integration (Jayapal *et al.*,2023) in Singapore, operational strategies (Roy, 2022) in the United Kingdom, and regulatory framework (Striepe*et al.,* 2024) in South Korea. Nevertheless, despite the global emphasis on improving vehicle fleet management efficiency, there is a notable scarcity of research on this issue within Tanzanian public higher learning institutions (Chiparo et al., 2023). Existing literature in Tanzania primarily addresses broader public sector contexts and highlights general inefficiencies, but does not delve deeply into the specific factors influencing fleet management efficiency in Tanzanian public higher learning institutions (Ampiah, 2018; Assey *et al.*,2017). A notable number of studies emphasise technology and its impact on fleet management efficiency but do not directly apply to the Tanzanian higher learning institution context and does not provide insights relevant to the public university context, and some focused specifically on technology adoption rather than technological use (Mohamed & Jokonya, 2021; Zengwei *et al*.,2018; Hidayat & Kinoro, 2023). This leaves a critical question: how do financial resources, technological use, and the regulatory framework interact to affect vehicle fleet efficiency in this unique setting? Therefore, this study aimed to explore these factors in the Tanzanian context, offering insights to guide public higher learning institutions in refining their fleet management strategies.

Generally, the study aimed at examining key determinants of vehicle fleet management efficiency in public higher learning institutions. Specifically, the study aimed to examine the influence of financial resources, the regulatory framework, and the use of technology on vehicle fleet management in public higher learning institutions. Public higher learning institutions in Tanzania have several responsibilities, including teaching, research, and community engagement. They work within decentralised structures and must follow strict public sector financial and asset management rules (URT, 2005; URT, 2010). These factors create unique and unpredictable transport needs, shared-use fleet systems, and limited budget flexibility. As a result, managing vehicle fleets in higher learning institutions differs from that in other public institutions (TCU, 2020). This study is significant as it addresses critical aspects of vehicle fleet management in Tanzanian public higher learning institutions, focusing on the impact of financial resources, regulatory framework, and technological factors. These findings are essential for enhancing resource optimisation, reducing costs, and improving overall fleet performance, thereby contributing to the sustainability and effectiveness of public university operations in Tanzania.

Theoretical Literature Review

The New Public Management (NPM) theory, proposed by Hood (1991), as cited in Kanuku and Ng'eno (2023), advocates public-sector reforms that adopt private-sector efficiency practices. NPM theory emphasises cost-effectiveness, performance measurement, and decentralisation. The theory emphasises optimising financial resources for cost efficiency, enforcing clear regulatory frameworks to improve compliance, and adopting advanced technologies such as fleet management systems to enhance operational efficiency (Machaba & Ndou, 2024). Additionally, its reliance on advanced technologies, performance metrics, and market-driven approaches can be difficult to implement in under-resourced institutions that lack sufficient funding,

infrastructure, or skilled personnel. This can create disparities in service delivery and limit the effectiveness of NPM reforms in such contexts. This study aligns with NPM's emphasis on efficient financial resource allocation, a strong regulatory framework, clear governance structures, and the use of technology in fleet management. This study provides a contextual extension of the NPM theory and translates abstract NPM concepts into measurable operational practices that enhance fleet management efficiency. This study provides a contextual extension of the NPM theory. The study translates abstract NPM concepts into measurable operational practices that enhance fleet management efficiency.

Meanwhile, since technological use and financial resources involve some resources, it can be analysed by using the resource-based view (RBV) based on the argument that organisational resources affect a firm's performance. The RBV involves three major constructs, namely firm performance , organisation, and organisation resources and capabilities (Liang, You, & Liu, 2010). Under this study, technological and financial resources were regarded as valuable resources but not totally inimitable, which can enhance vehicle fleet management efficiency (Liang et al., 2010). The study argued that organisations that can utilise new technology to a large extent and productively in their process and have adequate financial resources to support their operations are expected to perform well when compared to other organisations; the performance differences are attributed to differences in firm resources possessed (Mishra, 2005; Tinali, 2022). Furthermore, the study extends the application of RBV beyond private sector organisations. To an extent, RBV is not well valued in the public sector, as it is geared towards achieving competitive advantages, which are not highly pronounced in public sector organisations (Szymaniec-Mlicka, 2014).

Empirical Literature Review and Hypotheses Development

The empirical literature review covers studies that examine how financial resources, regulatory frameworks, and technology use affect vehicle fleet management efficiency. Literature on vehicle fleet management in public institutions reveals several critical gaps that warrant further investigation. Seniwoliba and Wuni (2023) emphasise the detrimental effects of insufficient funding on vehicle maintenance and service delivery; they often lack a detailed exploration of how financial resources interact with other factors, such as regulatory compliance and technological implementation, to impact overall fleet efficiency. Furthermore, Machaba and Ndou (2024) highlight challenges in fleet management but do not explicitly address how a robust regulatory framework could mitigate these issues. Moreover, Chiparo *et al.* (2022) and Kanuku and Ng'eno (2023) highlighted experiences of Zimbabwe and South Africa, respectively, limiting the applicability of findings to other contexts, particularly in Tanzania. Nevertheless, while technology's role in enhancing fleet management practices is acknowledged (Kanuku & Ng'eno, 2023), there is a lack of comprehensive models that integrate technological advancements with financial and regulatory factors. This integration is crucial for developing a holistic understanding of vehicle fleet management efficiency in public higher learning institutions.

Financial resources and Vehicle fleet management efficiency

Seniwoliba and Wuni (2023) emphasise that insufficient funding leads to high maintenance costs and frequent vehicle breakdowns in public higher learning institutions. Their study highlighted that when financial resources are limited, institutions struggle to maintain their vehicle fleets effectively, resulting in increased operational challenges. Additionally, Chiparo *et al.* (2022) found a strong correlation between effective financial management and fleet performance,

indicating that adequate funding is essential to implement best practices, such as regular servicing and necessary upgrades in vehicle maintenance and management. The study focused on state-owned enterprises, whereas this study focused on public higher learning institutions, which operate in a quite different context from other public institutions. Nevertheless, studies show that financial factors, including budgeting, cost control, and investment capacity, are critical determinants of vehicle fleet management efficiency because they directly affect maintenance, fuel consumption, and technology adoption (Kinyua et al., 2024; Mohamed, 2025). Although most existing research prioritises technological and operational considerations, financial resources are often mentioned only indirectly rather than identified as primary drivers of fleet efficiency (Fleet Technology Trends Report, 2024). Additionally, there is a significant research gap regarding financial challenges in public institutions, particularly in higher education, which this study aims to address. Based on the above-reviewed theoretical and empirical literature it is hypothesised that,

H_1: Financial resources positively influence vehicle fleet management efficiency in public higher learning institutions.

Regulatory framework and Vehicle fleet management efficiency

Ampiah (2018) highlights the importance of a well-defined regulatory framework in guiding fleet management practices. The study emphasises that institutions with established regulations and policies experience fewer compliance issues, leading to improved operational practices within their transport sections. A robust regulatory framework ensures adherence to safety protocols, improves resource allocation, and supports effective vehicle management strategies. Also, a study by Kajongwe *et al.* (2021) found that an effective regulatory framework in vehicle fleet management significantly impacts public-sector performance. Additionally, Mishra and Kumar (2023) in their literature review study indicated that the regulatory framework used as an independent variable has an impact on performance indicators. These findings suggest that a structured regulatory environment fosters efficiency and accountability in the fleet operations of public higher learning institutions. Furthermore, studies examining the equity impacts of regulatory interventions in autonomous vehicle deployment demonstrate that regulatory policies directly influence fleet behaviour and distribution outcomes within complex transport networks (Gao & Li, 2024). While much of the existing literature focuses on broader transport policy, evidence from related contexts, such as fleet policy in local authorities, suggests that inadequate regulatory control can adversely affect vehicle maintenance, fuel consumption, and overall operational performance (Kachilala et al., 2025). Additionally, studies on higher education policy and management indicate that governance and regulatory environments play a critical role in shaping institutional operations (Nguyen, Tran & Duong, 2023), implying that the regulatory context affects resource allocation and management systems. Nevertheless, empirical evidence remains scarce regarding the specific effects of formal regulatory frameworks on vehicle fleet management efficiency in public higher education institutions, where compliance requirements and governance structures differ from those of other public agencies. Based on the above-reviewed empirical and theoretical literature, it is hypothesised that,

H_2: The Regulatory framework has a positive influence on Vehicle fleet management efficiency in public higher learning institutions.

Technological use and Vehicle fleet management efficiency

A study by Kanuku and Ng'eno (2023) highlights how technologies such as GPS tracking and fleet management software enable better vehicle servicing, simplified mileage tracking, and improved maintenance quality. Additionally, Chiparo et al. (2022) suggest that integrating technology into fleet management not only streamlines operations but also enables more informed decision-making, ultimately improving service outcomes and operational efficiency. Further studies show that digital fleet management systems, telematics, and real-time analytics can improve fleet efficiency by enhancing tracking, route planning, maintenance, and cost control (Mohamed, 2025; Somuyiwa et al., 2025). Newer technologies such as IoT, AI, and sensor analytics also support proactive decision-making and predictive maintenance in fleet operations (Roy, 2025). Still, there is not much research on how the use of these technologies affects fleet management efficiency in public higher learning institutions, which face their own organisational, financial, and governance challenges. Based on the above reviewed empirical studies in connection with RBV it is hypothesized that,

H_3: Technological use has a positive influence on Vehicle fleet management efficiency in public higher learning institutions.

Conceptual Framework

The conceptual framework explores how financial resources, regulatory framework, and technological use influence vehicle fleet management efficiency in public higher learning institutions in Tanzania. Financial resources ensure timely maintenance and vehicle acquisition, while a strong regulatory framework enforces responsible use and compliance with safety standards. Technological tools like fleet management software and GPS tracking optimize vehicle performance and reduce inefficiencies. These independent variables directly impact the dependent variable fleet management efficiency as indicated in Figure 1.

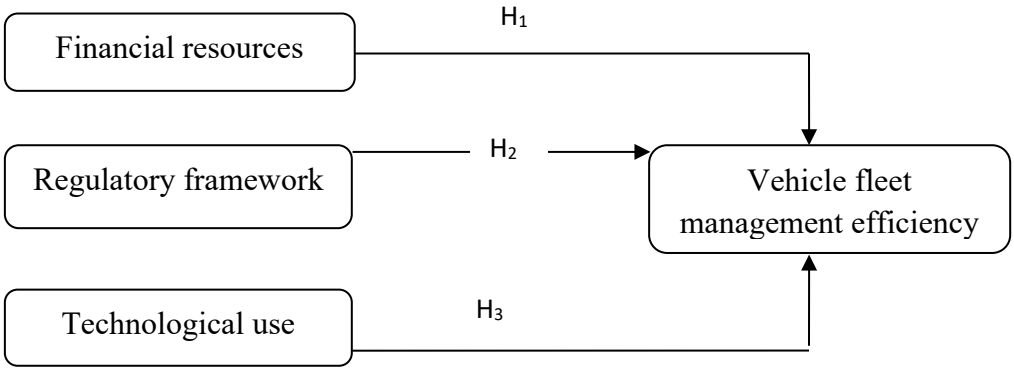

Figure 1: A Conceptual framework

Research Methodology

Positivist epistemology was used in this study because it emphasises objective measurement and observable, quantifiable data, making it suitable for testing hypotheses and establishing causal relationships (Park et al., 2020). Furthermore, an explanatory research design was used for the study at hand main reason for the selection was to describe the influence of financial resources, regulatory framework and technological use on the vehicle fleet management efficiency in public higher learning institutions (Saunders *et al.,* 2019). A quantitative research approach was

employed because it aligns with the research objectives, which aim to quantify relationships between variables and draw statistically sound conclusions. The targeted population was public higher learning institutions in Tanzania involved in fleet management operations. The targeted respondents were fleet managers, transport officers, and administrative officers who have relevant expertise and capacity to provide detailed information on vehicle fleet management efficiency. The study used a purposive sampling method to identify and select respondents. This technique ensures that only individuals with specific expertise, such as fleet managers, transport officers, and administrative officers, are chosen. This approach helps to minimise irrelevant responses and focuses on gathering valuable insights. Additionally, a multi-respondent approach was employed within each institution to reduce single-informant bias and systematic errors, as recommended by Ali *et al.* (2023). Multiple respondents also allowed for a richer understanding of the roles, challenges, and insights of different key personnel, such as transport officers and administrative officers, contributing to more robust and accurate conclusions. Sample size was set at 115 respondents, but only 111 responded in this study, giving a 96.5% response rate. The high response rate was a result of frequent follow up to targeted respondents. Since the total population was unknown, this sample size was considered adequate for capturing insights into the factors influencing fleet management efficiency, as explained by Adam (2020). Furthermore, Hair et al. (2010) suggested that the desired sample size should be between 15 and 20 observations per independent variable in multiple regression analysis. Therefore, since this study has 3 independent variables, the minimum required sample size in this study was supposed to be between 45 and 60 respondents.

A questionnaire was used as the primary data collection instrument. All variable measures were adopted from previous studies and were modified to suit the context of the current study, as highlighted in Table 1. A 5-point Likert scale was used in this study to provide a balanced range of response options that allow respondents to express varying degrees of agreement or disagreement while being simple and easy to understand (Adam, 2020; Chakrabartty, 2019). To ensure validity, the questionnaires were sent to three experts and then pretested, and the feedback obtained was used to revise and remove unnecessary indicators and retain only the most relevant elements. This study utilised Smart PLS4 for inferential analysis using the Structural Equation Model (PLS-SEM) and SPSS Version 27.0 for descriptive analysis. This study assessed the ethical dimensions of the research process, which entails clearly articulating the research objectives, safeguarding the confidentiality and anonymity of participants, and utilising the collected data exclusively for academic purposes. To bolster the credibility and reliability of the data, the respondents were also provided with an introductory letter to make the data collection process easier.

Table 1: Measurement of variables

S/N	Variables	Measurements	References
1.	Financial resources	Budget allocation for fleet management, cost of vehicle maintenance, percentage of funds spent on new acquisitions, and cost savings achieved through efficient management.	Ampiah (2018)
2.	Regulatory framework	Compliance rate with safety and environmental regulations, number of audits passed, clarity of fleet management policies, frequency of regulatory training sessions.	Seniwoliba and Wuni (2023)
3.	Technological use	Usage rate of fleet management software, number of vehicles equipped with GPS tracking, frequency of use of diagnostic tools, and percentage of operational improvements attributed to technology.	Machaba and Ndou (2024)
4.	Vehicle fleet management efficient	Vehicle uptime percentage, average maintenance costs per vehicle, fuel efficiency metrics, overall fleet operating costs, and user satisfaction ratings regarding fleet availability.	Chiparo *et al.* (2022)

Results

Respondents Characteristics

One notable observation is the gender distribution, with a higher percentage of male respondents (58.65%) than female respondents (41.35%). This suggests that male dominance is prevalent in fleet management roles within the institutions, which could reflect broader gender disparities in this field. The underrepresentation of women highlights the need for initiatives to encourage and support female participation in the sector, promoting gender equality and providing inclusive career development opportunities. In terms of age, the majority of respondents fall within the 35-44 years' age group (63.06%), followed by those aged 45 and above (29.73%). Only a small proportion is in the 25-34 years' category (7.21%). This distribution indicates that the workforce is predominantly composed of more experienced individuals, bringing a wealth of practical knowledge and expertise to the field.

Evaluation of the Reflective Measurement Model

Hair *et al.* (2021) emphasised that assessing the quality of a reflective measurement model using PLS-SEM involves assessing both reliability and validity. The findings from the study, as shown in Figure 2, indicate that all retained indicators meet this threshold, suggesting they effectively capture the constructs they are intended to measure. The high outer loadings for most indicators suggest that the constructs are robust and reliable, which is essential for drawing valid conclusions from the study.

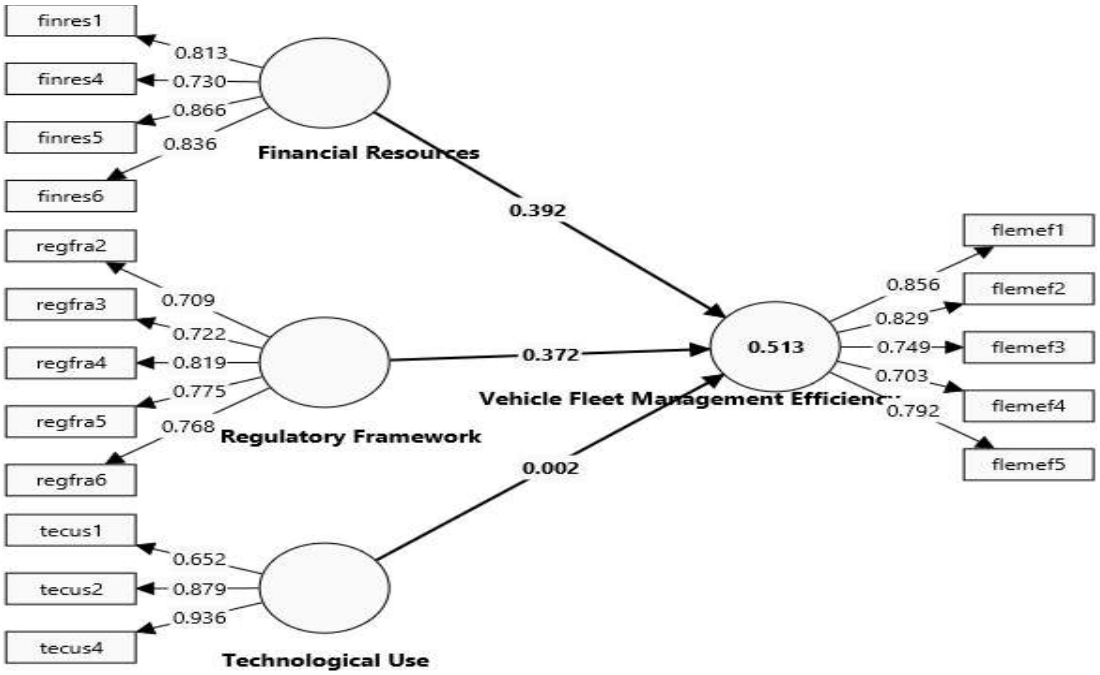

Figure 2: Final Measurement Model

As shown under Table 2, Cronbach's Alpha, Composite Reliability (Rho_A) and Composite Reliability (Rho_C) values are higher than the minimum required threshold value of 0.7, indicating that all constructs demonstrate acceptable internal consistency reliability. According to Hair *et al.* (2021), the Average Variance Extracted (AVE) is a key metric for assessing convergent validity in PLS-SEM. An AVE exceeding 0.50 indicates that a construct accounts for over 50% of the variance in its indicators, reinforcing the measurement model's validity. The results presented in Table 2 demonstrate that all constructs in the study exhibit AVE values above 0.50, meeting the minimum threshold for acceptable convergent validity.

Table 2: Internal Consistency Reliability, and Convergent Validity

	Cronbach's alpha	Composite reliability (Rho_a)	Composite reliability (rho_c)	AVE
1. Financial Resources	0.851	0.977	0.886	0.660
2. Regulatory Framework	0.852	0.970	0.872	0.577
3. Technological Use	0.832	0.809	0.868	0.691
4. Vehicle Fleet Management Efficient	0.856	0.907	0.890	0.620

Source: Field Data (2025)

Discriminant validity is a crucial assessment in PLS-SEM, ensuring that constructs in the structural model are distinct from one another (Becker *et al.,* 2023; Ringle *et al.,* 2023; Rönkkö & Cho, 2022)., emphasize that The Heterotrait-Monotrait (HTMT) ratio provides a robust measure of discriminant validity, addressing the limitations of the Fornell-Larcker criterion (FLC). The results in Table 3 demonstrate that all HTMT values are below the commonly recommended threshold of 0.85, indicating adequate discriminant validity.

Table 3: Heterotrait-Monotrait Ratio (HTMT)

	1	2	3	4
1. Financial Resources				
2. Regulatory Framework	0.800			
3. Technological Use	0.153	0.112		
4. Vehicle Fleet Management Efficient	0.604	0.549	0.103	

Source: Field Data (2025)

Evaluation of Structural (inner) Model

According to Hair *et al.* (2021), this evaluation begins with checking for potential collinearity issues, then assessing the significance and relevance of path coefficients, followed by analysing the model's explanatory and predictive power (Becker *et al.,* 2023). To detect collinearity, researchers commonly use the Variance Inflation Factor (VIF), which measures the extent to which an independent variable is correlated with other predictors in the model (Kock, 2015; Shrestha, 2020). Hair et al. (2019) recommend a VIF threshold of less than 3; values above this threshold indicate problematic collinearity that may bias regression estimates. The results in Table 4 indicate that the inner-model VIF values are well within acceptable limits, confirming that multicollinearity is not an issue. The absence of collinearity ensures that the estimated path coefficients remain robust, stable, and unbiased.

Table 4: Structural Model Results

	Path	β-Values	P-Values	97.5% C. I	f^2	Q^2	VIF
Hypotheses with Direct Effects							
H_1	Finres → Vfremef	0.392	0.000*	[0.192; 0.544]	0.133	0.478	2.381
H_2:	Regfra → Vfremef	0.372	0.000*	[0.248; 0.579]	0.121		2.337
H_3:	Tecus → Vfremef	0.002	0.982ns	[-0.183; 0.155]	0.000		1.029

*Note: Finres = Financial Resources, Regfra = Regulatory Framework, Tecus = Technological Use, Vfremef = Vehicle Fleet Management Efficiency *p < 0.01; ns if p > 0.05; R^2=0.513; R^2 Adj=0.499*

Source: Field Data (2025)

The first hypothesis (H_1) examined the effect of financial resources on vehicle fleet management efficiency in public higher learning institutions. The findings, as indicated in Table 4 reveal a significant positive influence of financial resources on vehicle fleet management efficiency [β = 0.392; t = 4.457; p < 0.01]. The second hypothesis (H_2) aimed to assess the impact of the regulatory framework on vehicle fleet management efficiency in public higher learning institutions. The findings indicate a significant positive influence of the regulatory framework on vehicle fleet management efficiency [β = 0.372; t = 4.572; p < 0.01]. The third hypothesis (H_3) examined the role of technological use in enhancing vehicle fleet management efficiency in public higher learning institutions. The results show that technological use has a non-significant

influence on vehicle fleet management efficiency [β = 0.002; t = 0.022; p > 0.05]. Hair *et al.* (2021) explained that the coefficient of determination (R^2), commonly referred to as in-sample predictive power, quantifies the variability elucidated within each of the endogenous constructs and acts as an indicator of the model's explanatory efficacy. In this study, the R^2 value is 0.513, indicating that approximately 51.3% of the variation in fleet management efficiency is explained by the independent variables such as financial resources, regulatory framework, and technological use.

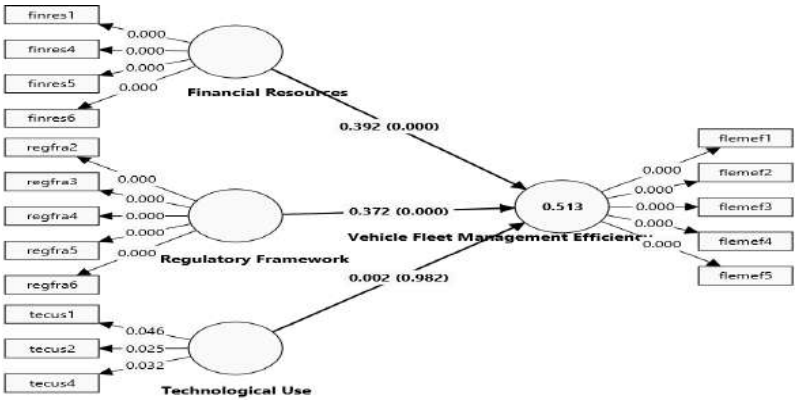

Figure 3: Structural Model Results

Importance-Performance Map Analysis (IPMA)

The Importance-Performance Map Analysis (IPMA) results offer valuable insights into both the significance and performance of constructs influencing vehicle fleet management in Tanzania's public higher learning institutions. As shown in Figure 4, the Financial Resources construct has a relatively high importance score of 0.392, indicating a significant contribution to vehicle fleet management efficiency. However, its performance is relatively moderate at 58.322, suggesting that while financial resources are crucial, their current application could be improved to enhance vehicle fleet management efficiency, as explained. Managers may need to prioritise improving the allocation and utilisation of financial resources to optimise fleet performance in public institutions. Similarly, the Regulatory Framework construct holds a strong importance value of 0.372, showing its relevance to vehicle fleet management. However, the performance score of 53.905 is lower than that of financial resources, indicating that while the regulatory framework is significant, its implementation and performance in practice need attention. Enhancing the regulatory environment, improving regulatory compliance, and improving fleet management practices. Technological Use has a very low importance value of 0.002, indicating minimal influence on vehicle fleet management efficiency. However, its performance score of 63.508 is the highest among the constructs, indicating that although technology is not seen as a major factor influencing fleet management, its performance is relatively strong. This could imply that technological advancements are being well utilised, but may not be a priority for driving improvements. It suggests that focusing on technological usage in fleet management could yield even greater efficiency if given higher importance.

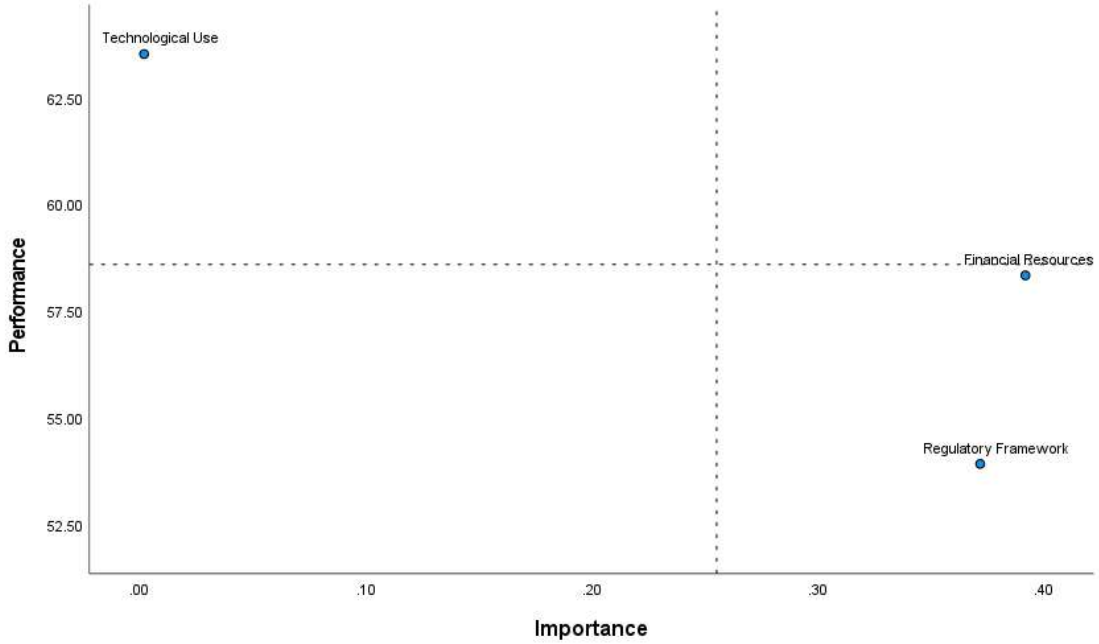

Figure 4: IPMA for Constructs

Discussion of Findings

The findings of this study provide valuable insights into the factors influencing vehicle fleet management efficiency in public higher learning institutions, with a focus on financial resources, regulatory frameworks, and the use of technology. Each of these factors plays a critical role in shaping the efficiency of fleet operations, as reflected in the study's outcomes. The study found that financial resources have a significant positive impact on vehicle fleet management efficiency. This result aligns with prior research, such as the work of Seniwoliba and Wuni (2023), who emphasised that when financial resources are constrained, institutions struggle to maintain their fleets, leading to increased operational challenges. Chiparo *et al.* (2022) also support this finding by demonstrating that sufficient financial resources enable the implementation of best practices in vehicle maintenance, such as regular servicing, timely vehicle replacements, and necessary upgrades. This supports the argument that institutions with better financial resources are better positioned to maintain high levels of fleet efficiency, reduce breakdowns, and minimise operational delays. Thus, the results of this study confirm that financial resources are a critical factor in achieving efficient vehicle fleet management in public higher learning institutions, as reflected in both local and international studies.

The regulatory framework has a positive influence on Vehicle fleet management efficiency in public higher learning institutions. This finding supports earlier work by Ampiah (2018), who argued that a well-defined regulatory framework is vital in guiding fleet management practices. Furthermore, supporting this notion, Kajongwe *et al.* (2021) found that a robust regulatory framework positively impacts the public sector's performance, particularly in fleet management. Their research emphasised that having established policies, standards, and guidelines is crucial for maintaining organisational accountability, especially in public institutions. In the context of public higher learning institutions, these frameworks not only provide operational guidelines but also ensure that resources are allocated properly and fleet management practices are aligned with institutional goals. Technological use has a positive influence on Vehicle fleet management

efficiency in public higher learning institutions. In contrast to the significant relationships observed between financial resources. This result is surprising given the extensive literature suggesting that the application of technology, particularly fleet management systems, can significantly enhance maintenance efficiency, reduce operational costs, and improve decision-making processes. The insignificant impact of technological use on vehicle fleet management (VEM) efficiency observed in this study contrasts sharply with findings from Kanuku and Ng'eno (2023) and Chiparo *et al.* (2022). Both studies highlighted the transformative role of technology in improving fleet maintenance efficiency, reducing operational costs, and enhancing decision-making processes. However, the lack of significance in this study suggests potential barriers to technology usage or effective utilisation within public higher learning institutions. These barriers may include limited access to advanced technologies, inadequate challenges in staff training, or challenges in integrating new systems into existing operations.

Conclusions, Implications, and Areas for Further Research

The study confirms that financial resources significantly improve the efficiency of vehicle fleet management. Adequate funding ensures proper maintenance, fuel procurement, and vehicle upgrades, directly enhancing operational performance. Therefore, sustainable budgeting and strategic resource allocation are essential for optimal fleet management. Regulatory compliance plays a vital role in fleet efficiency by enforcing safety, environmental, and operational standards. The findings show that strong regulations lead to better-managed fleets, reducing risks and improving accountability. Additionally, continuous monitoring and enforcement are necessary to maintain compliance. Surprisingly, the use of technology did not significantly affect fleet efficiency in this study. This suggests that simply implementing technology without proper integration or training may not yield benefits. Possible reasons include poor system compatibility, resistance to change, or insufficient data utilisation. Organisations should focus on user-friendly solutions and staff training to maximise the potential of technology. Therefore, public higher learning institutions should explore more advanced technological solutions and focus on implementing them to achieve greater improvements in fleet management efficiency.

The study contributes to the body of knowledge by illustrating how NPM theory and RBV can be applied to vehicle fleet management in public higher education institutions. This research expands the theory's application by demonstrating its relevance to managing university fleets, contributing to a deeper understanding of how public-sector institutions can improve their operations through resource optimisation. From a policy perspective, the study recommends that public higher learning institutions in Tanzania could develop policies that prioritise adequate financial resources and regulatory frameworks for vehicle fleet management. For managerial practices, the study suggests that fleet managers adopt comprehensive strategies that integrate financial oversight, regulatory compliance, and technology to enhance fleet efficiency. This managerial change would directly contribute to smoother and more cost-effective fleet operations. Academically, this study lays a strong foundation for further research on public-sector fleet management, particularly within higher education institutions. Future research should focus on exploring fleet management practices in the private sector, particularly in comparison with public higher education institutions. Investigating how private companies manage their vehicle fleets could provide valuable insights into best practices, efficiency strategies, and innovative approaches that could be applied in the public sector.

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