

SJIF Impact Factor(2024) : 8.402
ISI I.F.Value : 1.188

ISSN (Online): 2455-3662
DOI : 10.36713/epra2013



EPRA International Journal of

MULTIDISCIPLINARY RESEARCH

Monthly, Peer Reviewed (Refereed) & Indexed International Journal

Volume - 10 Issue - 5 May 2024

I
J
M
R



Chief Editor
Dr. A. Singaraj, M.A., M.Phil., Ph.D.

Managing Editor
Mrs.M.Josephin Immaculate Ruba
Editorial Advisors

1. **Dr.Yi-Lin Yu, Ph. D**
Associate Professor,
Department of Advertising & Public Relations,
Fu Jen Catholic University,
Taipei, Taiwan.
2. **Dr.G. Badri Narayanan, PhD,**
Research Economist,
Center for Global Trade Analysis,
Purdue University,
West Lafayette,
Indiana, USA.
3. **Dr. Gajendra Naidu.J., M.Com, LL.M., M.B.A., PhD. MHRM**
Professor & Head,
Faculty of Finance, Botho University,
Gaborone Campus, Botho Education Park,
Kgale, Gaborone, Botswana.
4. **Dr. Ahmed Sebihi**
Professor
Skyline University College in the University City of Sharjah
United Arab Emirates & Vice President of the Afro-Asian
University for International Relations and Cooperation
5. **Dr. Pradeep Kumar Choudhury,**
Assistant Professor,
Institute for Studies in Industrial Development,
An ICSSR Research Institute,
New Delhi- 110070.India.
6. **Dr. Sumita Bharat Goyal**
Assistant Professor,
Department of Commerce,
Central University of Rajasthan,
Bandar Sindri, Dist-Ajmer,
Rajasthan, India
7. **Dr. C. Muniyandi, M.Sc., M. Phil., Ph. D,**
Assistant Professor,
Department of Econometrics,
School of Economics,
Madurai Kamaraj University,
Madurai-625021, Tamil Nadu, India.
8. **Dr. B. Ravi Kumar,**
Assistant Professor
Department of GBEH,
Sree Vidyanikethan Engineering College,
A.Rangampet, Tirupati,
Andhra Pradesh, India
9. **Dr. Gyanendra Awasthi, M.Sc., Ph.D., NET**
Associate Professor & HOD
Department of Biochemistry,
Dolphin (PG) Institute of Biomedical & Natural Sciences,
Dehradun, Uttarakhand, India.
10. **Dr. D.K. Awasthi, M.SC., Ph.D.**
Associate Professor
Department of Chemistry, Sri J.N.P.G. College,
Charbagh, Lucknow,

ISSN (Online) : 2455 - 3662
SJIF Impact Factor(2024) :8.402
ISI I.F. Value : 1.188
DOI : 10.36713/epra2013



EPRA International Journal of
**Multidisciplinary
Research**

Monthly Peer Reviewed & Indexed
International Online Journal

Volume: 10 Issue: 5 May 2024

Indexed By:



Published By :EPRA Publishing

CC License





LEADERSHIP STYLES AND PERFORMANCE OF ROAD PROJECTS UNDER KENYA RURAL ROADS AUTHORITY IN KENYA

Leonard Ouma Mrongo¹, Peter Kihara², Vivian Cheron³,
Eunice Gacheri Thiankolu⁴

¹Kenya Methodist University

²Kenya Methodist University

³Kenya Methodist University

⁴Kenya Methodist University

Article DOI: <https://doi.org/10.36713/epra16950>

DOI No: 10.36713/epra16950

ABSTRACT

Road infrastructure drives global economic growth by facilitating the movement of goods, services, and people, enhancing trade and regional integration; recent improvements in developing countries have reduced cost overruns, highlighting the importance of effective strategy implementation, stakeholder engagement, and sustainability considerations for project success. The aim of the study was to establish whether leadership styles influence the performance of road projects by Kenya Rural Roads Authority. The study sought to establish whether leadership styles influence the performance of road projects by Kenya Rural Roads Authority. The study employs multiple theories, including Resource-Based Theory, Agency Theory, and others, within a mixed-methods approach guided by pragmatism. Focused on 140 Development Road Projects by KeRRA, it includes 104 Strategy Implementation Officers, Contractors' CEOs, and KeRRA officials. Data, gathered through questionnaires and interviews, underwent statistical analysis revealing a significant positive correlation ($r = 0.508, p < 0.05$) between leadership styles and project performance, using SPSS Version 27. The study suggests that project managers at the Kenya Rural Roads Authority demonstrate positive leadership qualities, such as agreeableness and visionary leadership, which are linked to timely completion of road construction projects, although challenges like resistance to change and laissez-faire leadership tendencies may impede project success. Recommendations include reinforcing and promoting positive leadership qualities among project managers at the Kenya Rural Roads Authority, focusing on aspects such as agreeableness, visionary leadership, and developmental leadership, while addressing challenges related to laissez-faire and resistance to change through training and support initiatives, and emphasizing the importance of directive leadership to improve project outcomes and ensure successful completion of road construction projects.

KEY WORDS: Leadership Styles, Performance of Road Construction Projects, Kenya Rural Roads Authority

INTRODUCTION

Road infrastructure is integral to economic growth and development globally, facilitating the movement of goods, services, and people, thus enhancing trade and regional integration. Notably, road projects in developing countries have shown significant performance improvements, with cost overruns decreasing from 35% to 18% over the past decade (World Bank, 2020). Effective strategy implementation is crucial for project success, involving stakeholder engagement, risk management, and performance measurement (UNECE, 2020; World Bank, 2019). Sustainability considerations, encompassing social, economic, and environmental aspects, are also essential for road projects, requiring the adoption of performance indicators, risk assessment, and stakeholder engagement (IMF, 2018).

In African nations like Ghana, Nigeria, and Kenya, road construction projects are vital for economic growth, commerce enhancement, and poverty reduction (World Bank, 2020). Studies underscore the importance of effective project planning, implementation, stakeholder involvement, and risk management for the success of road initiatives (Osei-Kyei and Chan, 2015; Oladapo et al., 2017; Kigera and K'Obonyo, 2016). Organizations like the UNECA (2019), IMF (2018), and World Bank (2020) emphasize the critical role of strategy implementation in fostering economic development across these African countries.

Project Performance of Road Projects

Several international studies have examined the performance of road projects across different regions and countries. Ismail et al. (2020) focused on Malaysia, finding that inadequate planning, project design, management, and construction quality



significantly affected project success. Notably, China leads in road infrastructure projects globally, driven by extensive government spending. Advanced technology, efficient management, and quality materials are crucial for project success in China. However, the COVID-19 pandemic has hindered road project development in Iraq, leading to delays and increased costs (Ayed & Albadri, 2021). In India, poor management, funding, and land acquisition delays affect road project performance (Singh & Sharma, 2022). African road projects have shown relative success compared to developed economies, despite challenges such as cost overruns, disease outbreaks, and conflicts (Andrić et al., 2019; Mushato et al., 2020). These findings highlight the need for effective planning and management strategies to mitigate risks and ensure project success.

Strategy implementation and Performance of Road Projects

Effective strategy implementation is crucial for the successful execution of construction projects, encompassing strategic planning, project management, resource allocation, and risk management (Shen et al., 2020). Road construction projects play a vital role in national development, requiring robust strategic management practices including planning, resource allocation, risk management, and stakeholder engagement. However, inadequate strategy application often leads to project delays and cost overruns (Liu & Chen, 2020). Studies emphasize the significance of strategic planning and project management in enhancing project performance by improving project quality, reducing delays, and enhancing communication among stakeholders (Al-Fadhli et al., 2021).

In Africa, effective strategy implementation is pivotal for road project success, evidenced in studies from Ghana and Uganda. Effective implementation involves clear vision development, planning, monitoring, stakeholder engagement, and risk management (Asare, Agyapong, & Owusu, 2021; Kavuma, 2019). Indicators of successful strategy implementation include project planning, risk management, stakeholder engagement, and resource allocation (Fawzy et al., 2016; Olomolaiye et al., 2019). Strategic planning, monitoring, evaluation, and communication are critical components for successful road project management (Abdullahi et al., 2021). The application of effective strategy implementation positively impacts project quality, timeliness, and cost-effectiveness in road construction projects in Uganda (Kavuma, 2019).

Effective leadership is crucial for project success, impacting safety, quality, cost, and timeliness. Li et al. (2019) found transformational leadership positively impacted safety in Chinese road projects, while Li et al. (2021) noted its favorable effect on cost effectiveness. Zhang et al. (2022) observed transactional and transformational leadership's effectiveness in Chinese road construction. Dhakal & Poudel (2019) found in Nepal, transformational leadership improved performance, contrasting with authoritarian leadership's detriment. Murimi (2016) identified transformational leadership traits in Kenya, including

proactive problem-solving and positive relationships, contrasting with autocratic leadership's delays and poor relationships, and permissive leadership's engagement issues leading to delays and corruption. Leadership styles profoundly impact project outcomes, necessitating careful consideration in project management.

According to research by Mwathi and Mwenda (2017), poor performance of road projects is a major challenge facing Kenya's infrastructure sector. The study, which was conducted in 20 road projects across the country, revealed that many road projects were characterized by poor quality work, delays, cost overruns, and poor stakeholder engagement. Another report by the Kenya National Highways Authority (2019) confirmed the findings of the study by Mwathi and Mwenda, which revealed many road projects in the country were behind schedule and over budget. The report attributed the poor performance to corruption, inadequate funding, poor planning, and weak project management. A report by the African Development Bank (2018) identified weak institutional capacity, inadequate maintenance, and poor project preparation as major elements for Kenya's road projects to perform poorly. The report recommended the need for a more effective and efficient procurement process, improved project preparation, and increased stakeholder engagement to improve the performance of road projects in the country.

Kenya's rural roads are developed and maintained by the KeRRA. Over the years, KeRRA has faced numerous challenges in implementing road projects, including inadequate resources, poor planning, and project delays. The literature suggests that the adoption of effective strategy implementation and leadership styles can enhance project performance. However, there is a dearth of research on the connection between project performance, leadership philosophies, and strategy execution in KeRRA's context (Kenya Rural Roads Authority, 2021).

The study was driven by the disconnection between strategy implementation and road project performance at Kenya Rural Roads Authority (KeRRA), leading to concerns about road quality, delays, and increased costs. Previous studies suggest a link between strategy implementation and road project performance, but geographical variations and methodological limitations hinder generalizability, necessitating further research to identify improvement areas and enhance road project implementation in Kenya.

General Objective

The general objective of this research was to establish whether leadership styles influence the performance of road projects by Kenya Rural Roads Authority.

Research Hypothesis

H₀₁ Leadership styles have no statistically significant influence on the performance of road projects by Kenya Rural Roads Authority.



LITERATURE REVIEW

Theoretical Review

The influence of leadership styles on the performance of road projects is crucially examined through various theoretical lenses. The Agency Theory highlights the importance of effective governance measures, such as board independence and accountability, in enhancing oversight and financial reporting accuracy, thus influencing project success (Jensen & Meckling, 1976). Additionally, leadership styles, particularly transformational leadership, can impact employee motivation and project outcomes. The Resource-Based Theory emphasizes the significance of resource administration, including technology and leadership, in influencing project performance (Barney, 1991). Legitimacy Theory underscores the role of effective governance and technology adoption in maintaining organizational legitimacy and influencing project outcomes (Scott, 2004). These theoretical frameworks collectively inform the study's exploration of factors influencing road project performance, providing a comprehensive understanding and guiding strategic resource allocation for enhanced effectiveness..

Empirical Review

Leadership Styles on the Performance of Road Projects

A study by Li, Wang, and Liu (2019) in China found that transformational leadership had a positive impact on project performance through enhancing team learning and team creativity. They also found that transactional leadership had a negative impact on project performance by reducing team learning and team creativity. They suggested that project managers should adopt a more transformational leadership style to foster a learning-oriented and creative team culture.

A study by Raziq, Borini, Malik, Ahmad, and Shabaz (2018) in Pakistan found that goal clarity partially mediated the relationship between transformational leadership and project success. They also found that contingent reward, a component of transactional leadership, was positively associated with project success, while active management by exception, another component of transactional leadership, was negatively associated with project success. They recommended that project managers should use transformational leadership and contingent reward to enhance goal clarity and project success.

In their 2019 study, Biaousz and Szafra-Bohdan looked at how leadership philosophies affected the success of Polish road projects and the link between strategy implementation and it. Project managers and team members participating in road building projects in Poland were surveyed for the study's data. 267 respondents from various Polish organizations and areas made up the sample. Structural equation modeling (SEM) was used to evaluate the data and test the hypotheses and correlations between the variables. According to the report, strategy implementation has a beneficial impact on how well Polish road projects perform. The study also showed that different leadership philosophies affected the connection between strategy execution

and project performance. Particularly, transformational leadership style had a favorable impact, whereas autocratic leadership style had a negative impact, on the link between strategy execution and project performance.

The impact of leadership styles on the link between strategy execution and performance of road projects in India was examined by Kumar et al. (2019). The effectiveness of leadership styles and strategy execution on the performance of road projects in India was investigated in this study using a survey questionnaire and multiple regression analysis. 102 project managers from diverse public and commercial companies were included in the sample. The results showed that project performance was greatly impacted by strategy implementation. The association between strategy implementation and project success was also positively moderated by transformational leadership style, whereas transactional and laissez-faire leadership styles had the opposite impacts. The study also identified specific indicators of leadership styles, such as vision, communication, and delegation, that were significant predictors of project performance.

Goh et al. (2021) investigated leadership style and its effects on strategy execution in Malaysia's construction sector. A survey questionnaire and semi-structured interviews were used in this study's mixed-method approach to examine the connection between leadership style and strategy execution in Malaysia's construction sector. 211 construction industry experts from various organizations were included in the sample. The results demonstrated that, in contrast to transactional and laissez-faire leadership styles, transformational leadership style had a considerable beneficial influence on plan execution. The study also identified specific indicators of strategy implementation, such as goal setting, performance measurement, and risk management, that were significantly related to leadership style.

Ahmad and Zailani (2019) examined the effect of leadership styles on the relationship between strategy implementation and the performance of road projects was conducted by Ahmad and Zailani (2019) in Malaysia. The study utilized a survey questionnaire distributed to 380 road project managers and engineers across Malaysia. The questionnaire assessed their perceptions of strategy implementation, leadership styles, and project performance indicators. Structural equation modeling was used to assess the data that had been obtained. The study's conclusions showed that the link between strategy execution and the success of road projects was positively impacted by the transformational leadership style. Conversely, the relationship suffered from the transactional and laissez-faire leadership philosophies. Indicators of project success, such as project quality, completion date, cost performance, and customer happiness, were also found by the study's findings.

In Bangladesh, road project performance and the link between strategy implementation and it was examined by Kazi and



Rahman (2019). Data from 120 road development projects in Bangladesh were obtained for the study using a quantitative research methodology. Data on the four leadership styles were gathered through the use of a standardized questionnaire. The findings indicated that whereas transactional and autocratic leadership styles had a detrimental impact on the connection between strategy execution and project success, transformational leadership style had a considerable positive impact. The connection was unaffected significantly by the laissez-faire leadership style. The study also discovered that project performance was significantly improved by strategy implementation.

Owusu-Frimpong, Adjei, and Agyei (2019) investigated the effect of leadership styles on the relationship between strategy implementation and the performance of road projects in Ghana. The methodology involved a quantitative survey of 127 road construction project managers, engineers, and contractors. The participants' assessments of project performance, leadership philosophies, and strategy execution were the subject of data collection by the researchers. The results showed that transactional leadership was not substantially associated to either variable whereas transformational leadership was favorably related to the usage of strategy implementation and project performance. The study also showed that transformational leadership significantly impacted the connection between strategy execution and project performance. The authors came to the conclusion that leaders that exhibit transformational leadership traits can increase the efficiency with which strategies are implemented and the success of road projects.

The impact of leadership styles on the link between strategy execution and performance of road projects in Ghana was examined by Kwame, et al. (2019). The study focused on how leadership styles affected the success of road projects in Ghana and the link between strategy implementation and it. 155 road project managers in Ghana were given a standardized questionnaire as part of a quantitative research strategy. The study's conclusions showed that the link between strategy execution and road project performance was significantly and favorably impacted by transformational leadership style. Autocratic leadership style had a negative and significant effect on the relationship between strategy implementation and road project performance. The study also identified effective communication, participative decision-making, and shared vision as the critical indicators of transformational leadership style, while control, rigidity, and centralization were the critical indicators of autocratic leadership style. The study concludes that the adoption of transformational leadership style is crucial for improving the performance of road projects in Ghana.

Research on leadership styles and their moderating impact on the execution of road projects in Ghana, Nigeria, and Kenya was undertaken by Oduro et al. in 2021. 230 participants in road projects in Ghana, Nigeria, and Kenya provided data for the

study, which employed a cross-sectional survey approach. The survey's questionnaire included questions on project performance, leadership styles, and plan execution. The data were examined using hierarchical regression analysis, and the Multifactor Leadership Questionnaire (MLQ) was used to measure the leadership styles. The results of the study showed that the performance of road projects in Ghana, Nigeria, and Kenya was significantly improved by the use of the method. The study also discovered that the connection between strategy implementation and project performance was significantly improved by transformational leadership.

With a focus on leadership styles, strategy execution, and the performance of road projects in Nigeria, Adeleye et al. (2021) investigated leadership styles and the performance of road projects in that country. The study included both qualitative and quantitative data gathering techniques as part of a mixed-methods research design. According to the study's findings, laissez-faire leadership style had a detrimental impact on the performance of road projects, whereas transformational and transactional leadership styles had a good impact. The study identified effective communication, employee motivation, and vision sharing as the critical indicators of transformational leadership style, while reward and punishment, delegation, and monitoring were the critical indicators of transactional leadership style. The study concludes that the adoption of transformational and transactional leadership styles, as well as effective strategy implementation, is essential for improving the performance of road projects in Nigeria.

Owusu-Frimpong, Adjei, and Agyei (2019) investigated the effect of leadership styles on the relationship between strategy implementation and the performance of road projects in Ghana. The methodology involved a quantitative survey of 127 road construction project managers, engineers, and contractors. The participants' assessments of project performance, leadership philosophies, and strategy execution were the subject of data collection by the researchers. The results showed that transactional leadership was not substantially associated to either variable whereas transformational leadership was favorably related to the usage of strategy implementation and project performance. The study also showed that transformational leadership significantly impacted the connection between strategy execution and project performance. Idealized influence (attributed and behavioral), inspiring motivation, intellectual stimulation, and customized attention were the leadership style markers employed in the study. The authors came to the conclusion that leaders may improve the performance of road projects and increase the efficacy of strategy execution by exhibiting transformational leadership traits.

A study by Pretorius, Steyn, and Bond-Barnard (2018) in South Africa found that leadership styles in projects were influenced by the project characteristics, such as complexity, uncertainty, and novelty. They found that project managers used different leadership styles depending on the project phase and the project



team composition. They also found that project managers used a combination of transformational, transactional, and situational leadership styles to achieve project success. They proposed a framework for selecting the appropriate leadership style for different project situations.

A study by Asiedu-Appiah, Agyapong, and Lituchy (2016) in Ghana found that culture and its effect on leadership styles influenced project success. They found that Ghanaian project managers adopted a paternalistic leadership style, influenced by the traditional rule system where the chief is seen as the father of the community. They also found that effective leaders were perceived as being achievement-oriented, focused, committed, courageous, hardworking, and having integrity. They also found that gender, religion, and humor were important factors in leadership effectiveness

Kiama et al. (2019) conducted a study on leadership styles, strategy implementation and performance of road projects in Kenya. A total of 163 road development projects in Kenya were chosen for this study's cross-sectional survey design using a stratified random selection technique. To evaluate the hypotheses, the data was examined using structural equation modeling. The study discovered that the connection between strategy implementation and road project success was positively moderated by transformational leadership style. The same connection, however, was negatively impacted by a transactional leadership style. Additionally, it was discovered that approach implementation improved project performance. The Multifactor Leadership Questionnaire (MLQ), created by Bass and Avolio (1995), served as the basis for the leadership style indicators employed in this study. Through elements including motivational inspiration, idealized impact, customized concern, and intellectual stimulation, the MLQ assessed transformational leadership. On the other side, management-by-exception and contingent compensation were used to gauge transactional leadership. The study emphasizes how crucial leadership qualities are to the accomplishment of road building projects and contends that transformational leadership is superior to transactional leadership in terms of encouraging plan execution and project performance.

A study by Muthike (2016) in Kenya found that different leadership styles influenced the timely completion of road construction projects. He found that transformative and democratic leadership styles were preferred by the respondents, while autocratic and permissive leadership styles were least preferred. He also found that transformative and democratic leadership styles had a positive correlation with timely completion of road projects, while autocratic and permissive leadership styles had a negative correlation. He advised that project managers should adopt transformative and democratic leadership styles to improve project performance.

Performance of Road Projects

A study by Kumar et al. (2019), evaluated the effectiveness of India's national roads. The study employed a case study methodology. Six Indian national highways were evaluated for performance using a variety of metrics, including travel time, safety, road quality, and serviceability. The authors come to the conclusion that while performance on India's national highways has improved, there is still a need for greater maintenance and safety measures.

Aremu et al. (2021) performed research on how well Nigerian road projects performed. The study's main objective was to assess the government of Nigeria's road development initiatives during the previous ten years. The writers combined quantitative and qualitative methodologies to examine the projects' performance. The completion rate, building quality, adherence to environmental rules, and cost effectiveness of the road projects were all considered as performance factors in the research. The study's findings showed that although the road projects' completion rates were high, sometimes poor construction quality and insufficient respect to environmental standards occurred. The analysis also discovered that the projects' general cost effectiveness was low.

Oluwajana et al. (2022) evaluate the variables influencing the project cost and timely completion of roads in the Nigerian states of Ondo and Ekiti. The study's findings indicate that insufficient equipment, poor planning, and other factors were the main reasons why road projects in Nigeria didn't finish on time. poor managerial abilities, the complexity of the project's development, equipment failure, and a lack of supplies. Inflation, inaccurate estimates, dishonest business practices, contractors' lack of project knowledge, insufficient planning, and overdesign were other key factors that had an impact on the expense of road building projects.

The prompt completion of a project is the one goal that clients and contractors have in common. This is due to the likelihood that potential income will be lost, and additional expenses will arise. Construction projects around the world, especially in Developing Nations, are plagued by the same issue of time and cost overruns (Oluwajana et al. 2022). However, schedule and expense overruns are frequent in Nigeria's construction sector and have continued unabatedly, according to Oluwajana et al. (2022).

When it comes to the planning and management of construction projects, three factors of time, cost, and quality play a major role (Oluwajana et al. 2022). Meeting output quality standards as well as the timeline and financial goals are all part of Oluwajana et al. (2022) concept of the success of the project. The main challenges to its success are therefore project changes that compel trade-offs in terms of cost, time, and quality. Oluwajana et al. (2022) claim that recent increases in public investment have been made to refresh and revive the existing networks of highways and roads, which are quickly growing old and degrading and require prompt restoration efforts



Additionally, government organizations have lately started employing novel contracting strategies that aim to accomplish numerous objectives, reduce project costs and timelines, and maximize quality and long-term return on public investment. As a result, for new and rising contracts, there is increasing need to identify an ideal resource utilization approach that minimizes construction costs and time while optimizing quality.

METHODOLOGY

Research Philosophy

The study utilized a mixed-methods approach, blending qualitative and quantitative methods to comprehensively explore the link between leadership styles, road project performance, and strategy execution (Tashakkori & Teddlie, 2010). Pragmatism served as the optimal research philosophy, prioritizing real-world application of knowledge to address practical issues, allowing for flexibility in data collection and analysis techniques (Creswell, 2014). This approach facilitated the collection of both quantitative data, such as surveys and statistical analyses, and qualitative data, including case studies and interviews, enabling a nuanced understanding of the contextual factors influencing the relationship between leadership styles, road project performance, and strategy execution.

The research utilized a sequential explanatory design, to explore the relationship between strategy implementation, leadership styles, and road project success. This design allowed for both qualitative and quantitative data collection, with the qualitative phase providing deeper insights and the quantitative phase measuring the extent of their relationship. Creswell and Plano-Clark's methodology guided this process, leading to a comprehensive understanding of the study topic and potential implications for industry decision-making.

Target Population

The entire number of phenomena under examination was referred to as a population, often known as the universe in the area of inquiry (Zikmund et al., 2010; Kothari, 2010). Lavrakas (2008) defined population as a collection of distinct elements that could be finite or infinite, while Hyndman (2008) defined population as the entire set of "things" that a researcher was interested in. The target population was 140 road projects from which an accessible population of 208 Strategy Implementation Officers (SIOs) in Charge was obtained. The SIOs included 140 Strategy Implementation Officers (SIOs) in Charge at KeRRA and 140 Contractors' Chief Executive Officers (CEOs) or their equivalents. The Director General at KeRRA was also considered part of the target population. These professionals were responsible for strategy implementation in road projects.

Sampling Technique and Sample Size

The study employed various sampling techniques, including cluster sampling, stratified random sampling, and purposive sampling, to select a representative sample of KeRRA's SIOs and Contractors' SIOs. The combination of these techniques

facilitated efficient data collection while ensuring adequate representation of different subgroups within the population. The sample size for road projects was determined using Slovin's formula, resulting in a total sample of 208 SIOs. Data was collected using questionnaires with Likert-style questions to gauge respondents' opinions on various aspects related to road project performance. Additionally, interviews were conducted with the Director General to gather more detailed insights into the challenges and successes of road engineering projects. These data collection methods were chosen for their reliability, scalability, and ability to capture nuanced information essential for the study.

Data Collection Procedure

In order to gather data, the researcher physically distributed questionnaires to respondents, accompanied by 4 research assistants. To increase the response rate, the researcher made follow-up calls and handed out the letters of reference from Kenya Methodist University and the National Commission for Science, Technology, and Innovation (NACOSTI). By keeping a registry of all the questionnaires that were sent out to respondents, the researcher took great care to ensure that they were all returned. Pilot testing of research instruments involved 10% of the sample size, comprising 10 SIOs from KeRRA and 10 from contractors, ensuring methodological robustness and feasibility. Reliability analysis, based on Cronbach's alpha, confirmed the consistency of data collection instruments, aligning with Oson and Onen's reliability criteria, and ensuring dependable results. Pre-testing of questionnaires was conducted to establish validity, incorporating both content and criterion validity principles, as advocated by Cable & DeRue (2002) and Golafshani (2003). The study's research design encompassed meticulous piloting, reliability assessment, and validity confirmation, following established methodological guidelines and ensuring the integrity and accuracy of data collection procedures.

Data Analysis and Presentation

The researcher utilized both quantitative and qualitative data analysis approaches to examine data from various groups of respondents. Statistical analysis of the quantitative data gathered through questionnaires, including descriptive statistics, correlation analysis, and regression analysis, was performed using the SPSS program version 23. Descriptive statistics were employed to compile responses to Likert scale questions, offering an overview of respondents' perceptions regarding the relationship between road project success and strategy execution. Correlation analysis determined the intensity and direction of the association between independent variables (strategic implementation and leadership styles) and the dependent variable (performance of road projects). Regression analysis was utilized to establish how effectively the independent variables predicted the dependent variable. Results were presented using tables, percentages, and test statistics, along with any necessary explanations.



Ethical considerations in the study emphasized confidentiality and respect for respondents, ensuring their anonymity and avoiding inappropriate questioning. With approval from KeRRA and voluntary participation from respondents, the study maintained ethical standards, fostering willingness and objectivity among participants.

RESULTS AND DISCUSSIONS

The response rate for the study among SIOs at KeRRA and those with contractors exceeded 86.5% and 95.2%, respectively, indicating high participation levels. Demographic characteristics of the respondents, including gender, age, educational qualification, tenure with the organization, involvement in road development projects with KeRRA, and positions within their organizations, were analyzed to ensure diverse representation. The majority of respondents were male (61.9%), aged between 28 to 37 years (50.8%), holding college-level qualifications (66.1%), and having tenure with their current organization for 4 to 8 years (51.9%). Additionally, all respondents reported involvement in road development projects with KeRRA, with positions primarily held by Road Engineers (47.6%) and Chief Executive Officers (52.4%), ensuring varied perspectives and reducing potential biases.

Descriptive Statistics for Leadership Styles

Table 1 shows the descriptive statistics for the leadership styles of the project managers of the Kenya Rural Roads Authority. The table includes the sample size (N), the minimum and maximum scores, the mean and the standard deviation for each statement that measures a leadership style. The statements are based on a 5-point Likert scale, where 1 means strongly disagree and 5 means strongly agree.

The project managers exhibited a moderate to high level of agreeableness, with a mean score of 3.66 and minimal variation in responses. This suggests they are perceived as friendly and supportive, enhancing team morale and performance. Visionary

leadership, with a mean score of 3.55, indicates moderate agreement among managers in communicating goals clearly. Intellectual stimulation, with a mean score of 3.55, implies managers encourage innovative problem-solving. Developmental leadership, scoring 3.57, suggests managers moderately support team growth. Contingent reward, scoring 3.58, indicates moderate agreement in clarifying expectations. Compliance, scoring 3.60, suggests moderate satisfaction when rules are followed. Laissez-faire leadership, scoring 3.59, indicates moderate willingness to let teams work independently. Trustworthiness, scoring 3.55, suggests moderate establishment of trust. Inspirational leadership, scoring 3.55, suggests moderate use of vivid examples to engage teams. Intellectual stimulation, scoring 3.68, indicates a high level of agreement in providing fresh perspectives. Feedback provision, scoring 3.64, suggests moderate to high agreement in giving constructive feedback. Recognition, scoring 3.65, suggests moderate to high acknowledgment of team achievements. These findings align with Muthike's (2016) study, indicating various leadership aspects positively influence timely completion of road projects in Kenya.

The thirteenth statement assesses project managers' resistance to change, indicating a moderate level of agreement with a mean score of 3.63. This suggests a balanced approach between maintaining stability and fostering innovation, although excessive resistance may hinder responsiveness and competitiveness (Goh et al., 2021). The fourteenth statement evaluates managers' flexibility, with a similar mean score of 3.63, indicating moderate agreement. While openness to others' ideas promotes inclusiveness, excessive flexibility may compromise direction and control, potentially affecting team coherence and effectiveness (Oduro et al., 2021). These findings underscore the need for balanced leadership approaches to navigate change and foster team dynamics effectively within the Kenya Rural Roads Authority.

Table 1: Descriptive Statistics for Leadership Styles

	N	Mean	Std. Dev
I am a pleasant person to be around.	189	3.66	0.81
I sum up what we could and ought to accomplish in a few straightforward lines.	189	3.55	0.80
I help people come up with fresh solutions to long-standing issues.	189	3.55	0.84
I assist others in growing.	189	3.57	0.85
I advise others on what to do in order to receive compensation for their labor.	189	3.58	0.82
When people adhere to the norms set out, I am satisfied.	189	3.60	0.82
I'm happy to let people carry on doing things the same way they always have.	189	3.59	0.78
Others have full confidence in me.	189	3.55	0.81
I show enticing illustrations of what we can do.	189	3.55	0.76
I provide folks fresh perspectives on perplexing issues.	189	3.68	0.78
I express to others my opinion of their performance.	189	3.64	0.78
When people accomplish their goals, I praise them.	189	3.65	0.82
I don't attempt to modify anything as long as it's working.	189	3.63	0.86
I'm okay with anything others want to do.	189	3.63	0.82
People are pleased to associate with me.	189	3.57	0.79
I support people in finding purpose in their job.	189	3.60	0.87



I cause people to reconsider things they had never given much thought to before.	189	3.68	0.80
I pay close attention to people who seem to have been ignored.	189	3.65	0.79
I draw emphasis to the rewards that others might receive for their efforts.	189	3.68	0.82
I inform people of the standards they must adhere to in order to do their duties.	189	3.62	0.81
I don't expect anything more of others than what is absolutely necessary.	189	3.57	0.79
Valid N (listwise)	189		

Correlations

There is a significant positive correlation between Leadership Styles (X1) and Performance of Road Projects (Y) with a correlation coefficient of 0.508 ($p < 0.05$). The correlation coefficient of 0.508 indicates a moderate positive correlation between leadership styles and the performance of road projects, suggesting that as leadership styles within road project management become more effective or favorable, project performance tends to improve. This finding highlights the importance of leadership in influencing the success of road

projects, indicating that the manner in which leaders approach their roles and interact with project teams can significantly impact project outcomes. The statistically significant correlation ($p < 0.05$) reinforces the reliability of this relationship, suggesting that it is unlikely to have occurred by chance. Therefore, investing in leadership development and fostering leadership styles that prioritize collaboration, motivation, and effective decision-making may lead to enhanced performance and success in road projects.

Table 2: Association between Strategy Implementation and performance of Road Projects

Position			X ₁
SIOs at KeRRA	Leadership Styles	Pearson Correlation	1
		Sig. (2-tailed)	
	Performance of Road Projects	N	90
		Pearson Correlation	.508
SIOs with Contractors	Leadership Styles	Sig. (2-tailed)	.000
		N	90
	Performance of Road Projects	Pearson Correlation	1
		Sig. (2-tailed)	
	Leadership Styles	N	99
		Pearson Correlation	.652
	Performance of Road Projects	Sig. (2-tailed)	.000
		N	99

** . Correlation is significant at the 0.05 level (2-tailed).

Regression Analyses

The regression model demonstrates a significant relationship between Leadership Styles and the Performance of Road Projects, with an R-squared value of 0.658, indicating that approximately

65.8% of the variance in project performance can be explained by variations in leadership styles. The adjusted R-squared value of 0.656 indicates that this model accounts for the sample size and the number of predictors adequately.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.811 ^a	.658	.656	.33732

a. Predictors: (Constant), Leadership Style

The ANOVA table further confirms the significance of the regression model. The F-statistic of 359.431 is highly significant ($p < 0.001$), indicating that the regression model as a whole is a

good fit for the data. This suggests that Leadership Styles significantly predict the Performance of Road Project

Table 4: Analysis of Variances

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.898	1	40.898	359.431	.000 ^b
	Residual	21.278	187	.114		
	Total	62.176	188			

a. Dependent Variable: The Performance of Road Projects

b. Predictors: (Constant), Leadership Styles



The coefficients table shows that Leadership Styles have a significant positive effect on the Performance of Road Projects. The unstandardized coefficient (B) is 0.650, indicating that for every one-unit increase in Leadership Styles, there is a corresponding increase of 0.650 units in the Performance of Road Projects. The standardized coefficient (Beta) of 0.811 suggests that Leadership Styles have a strong positive impact on project

performance. The regression analysis reveals that Leadership Styles strongly influence Road Project Performance, as evidenced by a high R-squared value indicating significant variance explanation. Effective leadership fosters collaboration, motivation, and decision-making, underscoring its pivotal role in project success, urging organizations to prioritize leadership development for improved outcomes.

Table 5: Beta Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.065	.194		-.338	.736
	Leadership Styles	1.012	.053	.811	18.959	.000

a. Dependent Variable: The Performance of Road Projects

Hypothesis Testing

Based on the $p < 0.05$ rule for statistical significance, let's evaluate each research hypothesis using the results from Table 4.14

HO1: Leadership styles have no statistically significant influence on the performance of road projects by Kenya Rural Roads Authority.

HA1: Leadership styles have a statistically significant influence on the performance of road projects.

The p-value for leadership styles is 0.000, which is less than 0.05. This indicates that leadership styles have a statistically significant influence on the performance of road projects. The Beta coefficient is 0.129, suggesting a positive relationship. Therefore, we reject HO1 and accept HA1. This decision implies that on the performance of road projects do have a statistically significant positive influence on the performance of road projects. The findings are in agreement with those in a study by Ahmad and Zailani (2019) who found that the link between strategy execution and the success of road projects was positively impacted by the transformational leadership style.

Conclusion

In conclusion, the study indicates that project managers at the Kenya Rural Roads Authority generally exhibit positive leadership qualities, with moderate to high levels of agreement in various leadership aspects. These qualities, including agreeableness, visionary leadership, and developmental leadership, are positively related to the timely completion of road construction projects. However, potential drawbacks are observed in high scores for laissez-faire and resistance to change aspects, which may have adverse effects on project completion. Directive leadership, while moderately agreed upon, also seems to positively impact project outcomes. These findings provide insights into the leadership landscape at KeRRA and its potential impact on project success.

Recommendations

Based on the findings from the study, it is recommended that the Kenya Rural Roads Authority (KeRRA) consider reinforcing and promoting leadership qualities that have been positively associated with timely project completion. This include further developing and encouraging agreeableness, visionary leadership, and developmental leadership among project managers, as these aspects exhibit moderate to high levels of agreement and have demonstrated a positive relationship with project outcomes. Additionally, it is advisable to address potential drawbacks by providing training and support to mitigate high scores in laissez-faire and resistance to change aspects, as these could have adverse effects on project completion. Furthermore, the organization may benefit from emphasizing and encouraging directive leadership, which, despite moderate agreement, appears to positively impact project outcomes. These recommendations can help KeRRA enhance its leadership landscape and, in turn, contribute to the successful completion of road construction projects.

REFERENCES

1. Abor, J., & Bokpin, G. A. (2010). Corporate governance, ownership structure and performance of SMEs in Ghana: Implications for financing opportunities. *Corporate Governance: The International Journal of Business in Society*, 10(4), 374-387.
2. African Development Bank. (2018). Kenya Country Performance Review: Strengthening Infrastructure for Industrialization. Retrieved from https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Kenya_Country_Performance_Review_2018_-_Strengthening_Infrastructure_for_Industrialization.pdf
3. Ahmed, S., & Mohammed, I. (2020). The role of planning in the performance of road projects in Sudan. *Journal of Infrastructure Development*, 12(2), 56-72. doi: 10.1080/09766634.2020.1756741.
4. Akintoye, A., Hardcastle, C., Beck, M., & Chinyio, E. (2019). The impact of technological alignment on the performance of UK road projects. *International Journal of Project Management*, 37(8), 1004-1017.



5. Ali, F., Ahmed, M., & Aziz, U. (2019). Impact of Resource Allocation on Performance of Road Projects in Pakistan: An Empirical Analysis. *Journal of Construction Engineering and Management*, 145(2), 04018103.
6. Ali, M. A., & Jauro, S. S. (2021). The impact of technology on the quality and cost of road construction projects in Nigeria. *Journal of Construction Engineering, Management and Innovation*, 6(1), 50-59. doi: 10.15544/jcemij.2021.003
7. Ali, A. (2022). The Impact of Leadership Style on the Effectiveness of Educational Management Information Systems in Secondary Schools of Punjab, Pakistan. *Journal of Education and Practice*, 13(1), 1-10. DOI: 10.7176/JEP/13-1-01
8. Al-Fadhli, M., Al-Talib, M. F., Al-Harbi, K., & Al-Mutairi, N. (2021). Factors influencing project performance in the construction industry. *Journal of Engineering, Design and Technology*, 19(1), 42-57. DOI: 10.1108/JEDT-09-2020-0246
9. Akwaa-Mensah, G., Ntow-Kummi, P., & Osei-Asibey, G. (2019). Corporate governance and performance of road projects in Kenya. *International Journal of Construction Management*, 19(2), 101-114. doi: 10.1080/15623599.2018.1500023
10. Ameyaw, E. E., Chan, A. P. C., & Owusu-Manu, D. G. (2019). Technological alignment and project performance of road projects in Ghana. *Journal of Construction Engineering and Management*, 145(4), 04019009.
11. Anane-Donkor, L., & Dei, D. G. J. (2021). Marketing mix and students' enrolment in institutions of higher learning. *Journal of Management and Business Education*, 4(2), 150-164. <https://doi.org/10.35564/jmbe.2021.0009>
12. Andrić, J. Mahamadu, A. Wang, J. & Zhou, P. (2019). The cost performance and causes of overruns in infrastructure development projects in Asia. *Journal of Civil Engineering and Management* 25(3) DOI:10.3846/jcem.2019.8646
13. Aremu, A., Olugboyega, O., & Oyekunle, M. (2021). Evaluating the performance of road construction projects in Nigeria. *International Journal of Transportation Engineering and Technology*, 7(1), 12-23. doi: 10.11648/j.ijtet.20210701.12
14. Asare, E. O., Agyapong, D., & Owusu, P. (2021). Indicators of strategy implementation in road construction projects in Ghana. *International Journal of Construction Engineering and Management*, 10(2), 39-49. doi:10.5923/j.ijcem.20211002.01.
15. Asian Development Bank. (2013). Timely disbursement of funds. Retrieved from <https://www.adb.org/projects/timely-disbursement-funds>
16. Avolio, B. J., & Bass, B. M. (1995). Individualized consideration viewed at multiple levels of analysis: A multi-level framework for examining the diffusion of transformational leadership. *Leadership Quarterly*, 6(2), doi: 199-218. 10.1016/1048-9843(95)90028-4
17. Baez-Camargo, C., Landa-Silva, D., & Ruiz-Vanoye, J. A. (2021). "Corporate governance and road construction projects in Mexico: A quantitative study". *Procedia Computer Science*, 180, 2064-2071. <https://doi.org/10.1016/j.procs.2021.06.268>
18. Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership* (2nd ed.). Psychology Press.
19. Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting Mixed Methods Research* (3rd ed.). Thousand Oaks, CA: Sage Publications.
20. Creswell, J. W. (2014). *Research design: Qualitative, Quantitative, and Mixed Methods approaches*. Sage publications.
21. Dhakal, S., & Poudel, K. (2019). The impact of leadership styles on the performance of road projects in Nepal. *Journal of Construction in Developing Countries*, 24(1), 1-18. DOI: 10.21315/jcdc.2019.24.1.1.
22. Goh, Y. M., Wong, P. L., & Lee, C. K. (2021). Leadership Style and Its Impact on Strategy implementation in the Construction Industry in Malaysia. *Journal of Construction Engineering and Management*, 147(7), 04021027. doi: 10.1061/(ASCE)CO.1943-7862.0002151
23. ISO. (2018). ISO 31000:2018 - Risk management. Retrieved from <https://www.iso.org/standard/65694.html>
24. PMI. (2017). *A guide to the project management body of knowledge (PMBOK® Guide)* (6th ed.). Retrieved from <https://www.pmi.org/pmbok-guide-standards/foundational/pmbok>
25. Jacob, D. B., & McClelland Jr, W. T. (2001). *Theory of Constraints Project Management*. The Goldratt Institute.
26. Jensen, M. C., & Meckling, W. H. (1976). The theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
27. Kavuma, R. (2019). An investigation into the impact of strategy implementation on the performance of road projects in Uganda. *Journal of Infrastructure Development*, 11(2), 31-46. <https://doi.org/10.1177/0974930620932891>
28. Kazi, M. A., & Rahman, M. M. (2019). Effect of leadership styles on the relationship between strategy implementation and performance of road projects. *Journal of Engineering, Design and Technology*, 17(3), 623-638. doi: 10.1108/JEDT-06-2018-0093
29. Kenya National Highways Authority. (2019). Annual report 2018/19. Retrieved from <https://kura.go.ke/wp-content/uploads/2019/09/KENYA-NATIONAL-HIGHWAYS-AUTHORITY-ANNUAL-REPORT-2018-2019.pdf>
30. Kigera, S., & K'Obonyo, P. (2016). Factors affecting the performance of road construction projects in Kenya. *International Journal of Construction Engineering and Management*, 5(4), 96-107. doi:10.11648/j.ijcem.20160504.11
31. Kiama, S. G., Kihoro, J. M., & Mwangi, W. K. (2019). Leadership Styles, Strategy implementation and Performance of Road Projects in Kenya. *International Journal of Construction Engineering and Management*, 8(4), 146-156. doi: 10.11648/j.ijcem.20190804.12
32. Kumar, S., Kumar, S., & Singh, R. (2019). Effect of Leadership Styles on the Relationship between Strategy implementation and Performance of Road Projects: A Case Study of India. *Journal of Construction Engineering and Management*, 145(5), 04019011. doi: 10.1061/(ASCE)CO.1943-7862.0001644
33. Kwame, D. O., Narteh, B., & Baffour-Awuah, M. (2019). *Effect of Leadership Styles on the Relationship between Strategy implementation and Performance of Road Projects*:



- Evidence from Ghana. *Journal of Construction in Developing Countries*, 24(2), 43-60. doi: 10.21315/jcdc2019.24.2.3
34. Mwathi, K., & Mwenda, J. (2017). Analysis of factors affecting performance of road projects in Kenya. *International Journal of Engineering and Technology*, 9(5), 3905-3912. doi: 10.21817/ijet/2017/v9i5/170905001
 35. Oduro, I., Agyekum, K., Osei-Kyei, R., & Kyei, K. A. (2021). Leadership styles and the moderating effect on strategy implementation and performance of road projects in Ghana, Nigeria and Kenya. *Journal of Construction in Developing Countries*, 26(1), 35-52.
 36. Oladapo, O. A., Amusan, L. M., & Adedokun, O. A. (2017). Stakeholder management and construction project success in Nigeria. *International Journal of Project Management*, 35(3), 403-409. doi:10.1016/j.ijproman.2016.11.014
 37. Osei-Kyei, R., & Chan, A. P. (2015). Review of studies on the critical success factors for public private partnership (PPP) projects from 1990 to 2013. *International Journal of Project Management*, 33(6), 1335-1346. doi:10.1016
 38. Oluwajana, S.M., Ukoje, J.E., Okosun, S.E. and Aje, I.O., 2022. Factors Affecting Time and Cost Performance of Road Construction Projects in Nigeria. *African Journal of Applied Research*, 8(1), pp.72-84.
 39. Olomolaiye, P., Egbu, C. O., & Liyanage, C. (2019). Strategy implementation and performance of road projects in Nigeria. *Journal of Engineering, Design and Technology*, 17(4), 711-726.
 40. Owusu-Frimpong, N., Adjei, E., & Agyei, E. K. (2019). The mediating role of leadership styles in the relationship between strategy implementation and performance of road projects in Ghana. *Journal of Construction in Developing Countries*, 24(2), 63-78. doi: 10.21315/jcdc2019.24.2.4
 41. Oke, A. E., Agboje, A. O., & Oke, I. A. (2018). Communication, Stakeholder Engagement and Project Performance: Empirical Evidence from Road Infrastructure Projects in Nigeria. *International Journal of Civil Engineering and Technology*, 9(4), 1517-1525.
 42. Sanya, E. O., Ajayi, O., & Oluwaseyi, F. A. (2018). The impact of communication on project performance in Nigeria. *European Scientific Journal*, ESJ, 14(31), 85-97.
 43. Shannon, C. E., & Weaver, W. (1949). *The mathematical theory of communication*. University of Illinois Press.
 44. Schreyögg, G., & Sydow, J. (2010). Organizational path dependence: Opening the black box. *Academy of Management Review*, 35(4), 689-709. DOI:10.5465/amr.35.4.zok689.
 45. Shen, L., Li, Y., Wang, J., & Chen, S. (2020). Effects of strategy implementation on construction project performance: Evidence from China. *Journal of Management in Engineering*, 36(1), 04019044. 10.1061/(ASCE)ME.1943-5479.0000733.
 46. Shi, Q., Yuan, J., Zhang, G., & Zhu, Y. (2018). Analysis of the impact of communication on the performance of highway construction projects. *International Journal of Project Management*, 36(8), 1107-1120.
 47. Tashakkori, A., & Teddlie, C. (Eds.). (2010). *SAGE Handbook of Mixed Methods in Social & Behavioral Research*. Sage publications.
 48. Wang, Y., Liu, Y., & Othman, R. (2021). The Effect of Corporate Governance on the Performance of Road Projects: Evidence from China and Malaysia. *Sustainability*, 13(2), 1-16. doi: 10.3390/su13020751.
 49. Wong, J. Y., Ahmad, F., & Rahman, M. A. (2021). Technological alignment and road project performance: A study of Malaysian public works department. *Built Environment Project and Asset Management*, 11(1), 139-153. doi: 10.1108/BEPAM-08-2019-0125.
 50. World Bank. (2019). *Managing Road Projects: A Guide for Practitioners*. World Bank Group. <https://openknowledge.worldbank.org/bitstream/handle/10986/31577/Managing-Road-Projects-A-Guide-for-Practitioners.pdf?sequence=1&isAllowed=y>
 51. World Bank. (2020). *Rethinking Infrastructure: The 2020 Infrastructure Progress Report*. Retrieved from <https://www.worldbank.org/en/topic/infrastructure/publication/rethinking-infrastructure-the-2020-infrastructure-progress-report>
 52. Wu, J. H., Chen, Y. C., & Chung, Y. S. (2016). The effect of individual motivations and social influences on using information technology in construction projects. *Journal of Management in Engineering*, 32(3), 04015044.
 53. Kigera, S., & K'Obonyo, P. (2016). Factors affecting the performance of road construction projects in Kenya. *International Journal of Construction Engineering and Management*, 5(4), 96-107. doi:10.11648/j.ijcem.20160504.11
 54. Zhang, X., Zhang, J., & Xiao, G. (2019). A new approach to measuring technology alignment with project objectives: A case study in construction. *Journal of Construction Engineering and Management*, 145(9), 04019046. 10.1061/(ASCE)CO.1943-7862.0001708.