Proceedings of the International Conference on Industrial Engineering and Operations Management

Publisher: IEOM Society International, USA DOI: 10.46254/AF07.20260063
Published: May 13, 2026

A Data-Driven Model for Forecasting Cost and Schedule Overruns in Infrastructure Projects

Akinlo Olorunju Mogbojuri and Oludolapo Akanni Olanrewaju
Department of Industrial Engineering
Institute of System Science
Durban University of Technology, South Africa
akinlo.mogbojuri@gmail.com, akinlom@dut.ac.za, oludolapoo@dut.ac.za

Abstract

Infrastructure projects frequently encounter budgetary and schedule overruns. A cost overrun refers to the variance between anticipated and actual project expenditures, whereas a schedule overrun denotes the divergence between the actual duration of a project and the timeframe originally stipulated in the contract. This paper presents a predictive algorithm utilizing a gradient boosting model to forecast potential cost and schedule overruns during the project's earliest phase. The findings indicate the optimal hyperparameters for the Gradient Boosting Regressor, comprising 0.01 learning rate, a max tree depth of 3, and 300 estimators. The optimized model demonstrates commendable performance in predicting conceptual cost and schedule overruns, with R^2 approximately 0.96, RMSE approximately 5.68, MSE approximately 32.32, and MAE approximately 3.84, thereby affirming the suitability of data-driven machine learning techniques for forecasting cost and schedule overruns in infrastructure projects. The study demonstrates that early identification of potential overruns enables project managers and policymakers to implement proactive mitigation strategies, such as contingency planning, resource reallocation, and schedule optimization, while practitioners can utilize these strategies for real-time performance evaluation and risk mitigation.

Keywords
Cost overrun, Forecasting, Gradient boasting regressor, Infrastructure projects, Schedule overrun

1. Introduction

According to Abdelalim et al., (2025) Cost overrun, usually referred to as "price inflation" or " expenditure exceeding," is a fundamental theme in building theory. It is characterized as an unanticipated escalation in project expenses, or alternatively, as the ratio of actual expenditures to estimated costs. This denotes the surplus of actual costs above estimates, employing consistent baseline metrics, or is described as the divergence within actual finalized expenses and anticipated costs or agreements amounts adjusted for rising expenses. Gómez-Cabrera et al., (2025) delineate cost overruns or deviations as instances where the financial resources designated in the earliest phases of a project are inadequate to embed the expenditures induced while development. Such variances are classically demonstrated as a percentage variance between the total expenditure and earlier estimated expenses, a phenomena pragmatic in both affluent and economically disadvantaged nations (Gómez-Cabrera et al., 2025). Plebankiewicz, (2018) suggests that cost overrun is the disparity between the initial contract value and the expenses incurred upon practical execution. A cost overrun is the difference between projected and actual building expenses. The budget established at the decision to construct serves as the benchmark for assessing potential overruns, whereas real construction costs are defined as the accounted expenses at project completion. Lekraik & Ojekemi, (2025) assert that since the 1980s, the notion of project achievement has grown above the conventional 'iron triangle' which focuses on cost, time, and quality to encompass factors such as customer fulfillment, sustainable development, and social responsibility. Notwithstanding this comprehensive viewpoint, the cost aspect of these requirements remains vital for the majority of consumers.

Also, Gómez-Cabrera et al., (2025) opined that schedule overruns in infrastructure projects represent a worldwide concern that impacts the punctual completion of projects, resulting in considerable economic, social, and political repercussions. Schedule overruns lead to significant delays in the delivery of essential economic and social development projects, hence limiting their beneficial effects on adjacent communities. Similar to cost overruns, timetable delays manifest throughout construction when contractors encounter challenges in delivering tasks within the timelines set during the initial phases of the project. Such delays may result in adverse consequences, including litigation, lawsuits, and conflicts. Schedule variation, sometimes referred to as tardiness, is generally represented as the proportion of variation within planned and real building durations (Gómez-Cabrera et al., 2025). Infrastructure project delays are a pervasive global issue that profoundly impacts prices, timelines, and the quality of infrastructure delivery. In developing nations, these obstacles are especially detrimental, considering the crucial function of civil infrastructure in facilitating economic growth and public services (Yupari Bravo & Rodriguez Mogollon, 2025). Research indicates that project delays are a global phenomenon, including infrastructure projects on all continents experiencing such setbacks. Delays have occurred in multiple nations, as well as railway projects in Portugal, transportation investments in Australia, major infrastructure endeavors in Germany and New Zealand, significant infrastructure developments in Britain and America, government gigantic constructions in Italy, remote initiatives in Nepal, power infrastructure projects, and massive hydropower schemes in Brazil, among others (Andrić et al., 2025). Melaku Belay et al., (2021) examined the detrimental impacts of excess costs and tardiness on many different parties in construction projects, including owners, contractors, and practitioners. They note that, for contractors, it leads to financial losses owing to inadequate performance and defamation, which might damage the company's future contractual prospects if deemed guilty. To the customer or owner, both concerns in infrastructure projects signal an escalation in expenditure over the previously set contract amount, resulting to unsatisfactory investment returns. For practitioners, cost overruns and schedule delays signify an inability to fulfil the specified work, thereby damaging their reputations and eroding the confidence of important stakeholders (Melaku Belay et al., 2021).

1.1 Objectives

This study is to develop a predictive algorithm employing statistical and machine
learning methodologies to anticipate potential cost and schedule overruns in the initial phase of a project.

2. Literature Review

The extensive effects of schedule and cost irregularities noted in infrastructure projects across both industrialized and developing nations have prompted numerous studies. Love et al., (2012) observes that numerous extensive social infrastructure projects in Australia, such as hospitals, law enforcement facilities, museums, educational institutions, and recreational amenities, have encountered significant delays attributable to inadequate project governance and design flaws. The analysis of adopted case studies aims to identify the intermediary events and activities that led to project cost overruns. The examination of the case data resulted in the development of a conceptual framework for social infrastructure project overruns. Ismail et al., (2021) assesses the differences in cost overrun studies between rich and developing countries. An integrative approach adopting the Protocol, Search, Appraisal, Synthesis, Analysis, and Report (PSALSAR) paradigm in conjunction with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines was executed for screening and selection. Their study indicates that developing nations have conducted similar research on cost overruns as developed nations; however, most of the studies lack specificity regarding construction types, whereas developed nations have progressed towards focusing on more targeted projects. Melaku Belay et al., (2021) examined the extent and risks associated with cost overruns and timetable delays in building projects. The report advocates for the use of key performance indicators as benchmarks for primary stakeholders to alleviate the substantial threats of project cost overruns and associated time retards in the Ethiopian construction sector. Their analysis highlighted the extent of cost overruns and delays in construction and road infrastructure projects, providing recommendations for major players to improve the overall cost and time efficiency of infrastructure initiatives within the Ethiopian construction sector. Gómez-Cabrera et al., (2025) investigated disparities in time and price within minor road infrastructure projects in Colombia, highlighting the influence of public procurement characteristics. A four-stage procedure involving initial assessment, bivariate examination (as well as correlation and Kruskal–Wallis tests), and multiple-variate analysis using Random Forest and Bayesian networks was utilized. Their research offers empirical evidence to refine award procedures and facilitate more informed future project planning, assisting public bodies in minimizing discrepancies and improving infrastructure outcomes. Sourav et al., (2025) examined stakeholders' heterogeneous perceptions of delays in infrastructure projects. This study employed a novel methodology utilizing SEM to comprehend the variability in stakeholder views. The heterogeneity analysis revealed divergent reactions across stakeholders from the Engineering

Department, the Planning Office, and the Construction Firm/Industry. A significant group of stakeholders contends that their phase is not experiencing delays and that other phases necessitate focus. Pedron et al., (2025) developed a thorough and data-centric framework to alleviate construction delays employing the Analytical Hierarchy Process (AHP). Their investigation revealed seven primary factor categories: client-related, contractor-related, consultant-related, goods, staff and supplies, legal challenges, and outside forces. The AHP study identified administration of finances, scheduling and preparation, and coordination of regulations as the most critical variables. Yupari Bravo & Rodriguez Mogollon, (2025) utilized the AHP to identify and rank the primary reasons of tardiness in civil construction projects in Peru. The research reveals deficiencies in technical documentation, erroneous cost projections, and insufficient scheduling and preparation as the primary issues affecting project timelines and performance. Their study presents a prioritized approach for tackling these challenges and proposes actionable solutions to enhance planning, coordination, and risk reduction in forthcoming initiatives. Shafaay et al., (2025) examined the risk factors affecting construction cost overruns throughout the Front-End Engineering Design (FEED) phase of mining projects using Partial Least Squares Structural Equation Modelling (PLS-SEM). The study identified several significant risks, including an impractical project timeline, insufficient feasibility assessment, customer pressure to reduce the initial financial expenditure, inaccurate cost estimates, increasing prices, fluctuations in the nominal exchange rate, inadequate comprehension of the deposit's geological and geotechnical characteristics, delays in license obtaining and authorization, supply chain disruptions, and effects on nearby neighborhoods and infrastructure. Their study empowers stakeholders to adopt proactive strategies during the FEED process by providing practical knowledge, leading to more anticipated and effective project outcomes. It provides a comprehensive framework for alleviating excess expenditures in mining projects. Precious, (2025) examined the cost excesses and tardiness affecting four major development projects in the Greater Accra Region of Ghana. The research employed the standard correlation technique in SPSS version 25, revealing a complicated and inconsistent relationship between cost and schedule parameters. A notable inverse correlation was identified between these elements, while simultaneously indicating that cost overruns favorably affect schedule performance. Their research enhances the Triple Constraint Theory by elucidating intricate, non-linear interactions between cost and schedule factors that undermine traditional conceptions. Andrić et al., (2025) examined temporal efficiency and found the determinants of delays in infrastructure projects in South Asia. A multiple regression analysis was employed to determine the suitable function for modeling the intricate relationship between time overruns and many contributing factors, including delays from land acquisition and resettlement, procurement issues, contractor delays, and design modifications. The authors suggested that machine learning techniques, such as random forest regression, yield more effective and adaptable models, enhancing the comprehension of intricate relationships between delays and other parameters. Ultimately, the literature inadequately addresses issues of data quality, bias, benchmarking criteria, and the ethical deployment of prediction algorithms. The lack of standardized datasets and evaluation metrics obstructs comparison analysis, while ethical and governance issues restrict the acceptable use of predictive analytics into public infrastructure project management.

3. Methodology

3.1 Gradient Boosting Model

Gradient boosting is a collective learning technique employed for classification and regression applications. It is a refinement technique that develops a strong prediction model by integrating several weak learners. It operates by continuously training models, with each new model attempting to address the shortcomings of the previous one. Each successive model in gradient boosting is trained to minimize the loss function, such as mean squared error or cross-entropy, of the preceding model by gradient descent (Sahu et al., 2025). It is an ML approach utilized in regression and classification applications. It develops a predictive model by synthesizing numerous weak predictive models, usually decision trees. Gradient Boosting Machine (GBM) is a powerful machine learning technique utilized for regression and classification purposes. GBM incrementally develops an ensemble of trees, improving upon the residuals of the prior trees (Attar et al., 2025). The Gradient Boosting Regressor systematically builds a series of weak learners to minimize prediction errors, adeptly capturing complex, nonlinear interactions among variables in infrastructure projects (Özkaya et al., 2026). XGBoost is a suitable ensemble learning technique for delivering precise cost projections in the conceptual cost estimation of infrastructure projects, owing to the limited sample size of small-capitalization initiatives for two reasons. XGBoost routinely demonstrates superior performance, surpassing most machine learning algorithms in many estimate tasks, recognized for its excellent accuracy and model durability. Secondly, in contrast to numerous traditional machine learning algorithms, deep learning techniques, and various ensemble methods, XGBoost excels with large datasets while also demonstrating a notable capacity to handle smaller datasets and mitigate overfitting, attributable to the incorporation of a normalization function within its objective function (Zhang et al., 2025).

4. Data Collection

The data for this study were collected from a regional agency responsible for managing public infrastructure projects in the Niger Delta, Nigeria, specifically regarding health infrastructure. The dataset comprises 59 projects for the development of comprehensive health centers, distinguished by essential parameters like project type, starting project cost, final project cost, project length, and final duration, as illustrated in Table 1. The costs of project contracts vary from around NGR 19.2 million to NGR 249.8 million, culminating in a total of approximately NGR 6.8 billion, with project durations extending from 12 to 15 months.

Table 1. Overview of the project data

S/N	Project Description	Initial Project Cost (₦)	Final Project Cost (₦)	Duration (Months)	Final Durations (Months)
1	Construction of Comprehensive Health Care Centre	249,050,000.09	348,670,000.13	15	16
2	Construction of Mega Caring Heart Centre	250,000,000.88	300,000,001.06	15	16
3	Construction and Equipping of Mother and Child Hospital	200,000,000.00	260,000,000.00	15	16
4	Reconstruction of Health Centre	24,287,185.00	24,287,185.00	12	15
5	Construction of Wooden Comprehensive Health Centre	29,309,767.50	43,964,651.25	12	16
6	Construction of Comprehensive Health Centre	29,600,000.00	41,440,000.00	15	15
7	Construction of Wooden Comprehensive Health Centre	29,309,767.50	35,171,721.00	12	15
8	Construction of Comprehensive Health Centre	33,409,633.50	50,114,450.25	15	17
9	Construction of Comprehensive Health Centre	43,948,268.10	57,132,748.53	15	15
10	Construction of Comprehensive Health Centre	249,500,000.00	249,500,000.00	15	16
11	Construction of Comprehensive Health Centre	249,500,000.00	299,400,000.00	15	16
12	Construction of Comprehensive Health Centre (Wooden)	19,240,650.00	26,936,910.00	12	18
13	Construction of Wooden Comprehensive Health Centre	43,436,040.67	56,466,852.87	12	13
14	Construction of Wooden Comprehensive Health Centre	22,682,356.30	34,023,534.45	12	15
15	Construction of Mortuary Building	79,743,557.50	95,692,269.00	12	15
16	Construction of Health Centre	22,682,356.20	27,218,827.44	12	15
17	Comprehensive Health Centre	43,436,040.00	43,436,040.00	15	15
18	Construction of Comprehensive Health Centre	43,436,040.60	60,810,456.84	15	18
19	Construction of Comprehensive Health Centre	27,167,899.80	35,318,269.74	15	17
20	Construction of comprehensive health centre	90,175,041.60	135,262,562.40	15	17
21	Construction of community health centre	49,952,071.50	64,937,692.95	15	16
22	Construction of Comprehensive Health Centre	43,436,040.05	60,810,456.07	15	17
23	Construction and equipping of mother and child hospital	199,402,426.08	239,282,911.30	15	16

24	Construction of comprehensive health centre	29,309,767.50	29,309,767.50	12	16
25	Construction of comprehensive health centre	100,000,000.00	150,000,000.00	12	17
26	Construction and equipping of modern health centre	149,586,384.00	194,462,299.20	15	16
27	Construction and equipment of basic health centre	238,756,824.00	334,259,553.60	15	15
28	Construction of comprehensive health centre	43,436,040.60	43,436,040.60	15	18
29	Construction of health centre	43,436,040.60	65,154,060.90	15	16
30	Renovation of General hospital	43,436,040.60	60,810,456.84	12	15
31	Renovation of General hospital	43,436,040.60	52,123,248.72	12	17
32	Building of Comprehensive Health Care Centre	249,050,000.00	249,050,000.00	15	17
33	Building of Mega Caring Health Centre	250,000,000.00	300,000,000.00	15	15
34	Building and Equipping of Mother and Child Hospital	200,000,000.00	280,000,000.00	15	16
35	Building of Comprehensive Health Centre	43,948,268.10	65,922,402.15	15	16
36	Building of Comprehensive Health Centre	249,500,000.00	249,500,000.00	15	15
37	Building of Comprehensive Health Centre	249,500,000.00	299,400,000.00	15	17
38	Construction of Mortuary Building	79,743,557.50	103,666,624.75	15	17
39	Construction of Comprehensive Health Centre	90,175,041.60	135,262,562.40	15	17
40	Construction and Equipping of Mother and Child Hospital	199,402,426.00	259,223,153.80	15	16
41	Building of Comprehensive Health Centre	100,000,000.00	120,000,000.00	15	16
42	Building and Equipping of Modern Health Centre	149,586,384.00	149,586,384.00	15	18
43	Construction and Equipment of Basic Health Centre	238,756,824.00	358,135,236.00	15	16
44	Construction of Comprehensive Health	43,436,040.60	60,810,456.84	15	16
45	Construction of Health Centre	43,436,040.60	52,123,248.72	15	16
46	Supply and Installation of Medical Equipment at General Hospital	200,000,000.00	260,000,000.00	15	16
47	Mother and Child Hospital	187,286,789.13	280,930,183.70	12	15
48	Construction of Model Health Centre	118,715,208.22	118,715,208.22	12	15
49	Model Basic Health Centre	98,455,965.45	118,147,158.54	12	16
50	Building of a Health centre	149,586,384.00	194,462,299.20	15	15
51	Building of a Health centre	43,436,040.60	65,154,060.90	15	15
52	Building of a Health Centre	200,000,000.00	280,000,000.00	15	17
53	Construction of a Health centre	79,743,557.50	95,692,269.00	15	15
54	Construction of Heath Centre	249,500,000.00	249,500,000.00	15	16
55	Building of Health Centre	100,000,000.00	140,000,000.00	15	16
56	Building of Health centre	43,436,040.60	43,436,040.60	15	18
57	Building of Health centre	249,500,000.00	324,350,000.00	15	17
58	Building of Health centre	118,715,208.22	166,201,291.51	15	17
59	Construction of Health centre	90,175,041.60	108,210,049.92	15	17

5. Results and Discussion

The proposed gradient boosting model was programmed and debugged in the Python 3.12.7 environment with, Pandas 3.0. The result in Tables 2 and 3, shows that the optimal hyperparameters for the gradient boosting regressor and performance evaluation metrics test set. Figure 1 shows the comparison of actual and predicted final project costs.

Table 2. The optimal hyperparameter combinations determined by GS.

	learning_rate	max_depth	n_estimators
Grid Search (GS)	0.01	3	300

Table 3. Model performance evaluation metrics.

	R^2	RMSE	MSE	MAE
Grid Search (GS)	0.76	5.68	32.32	3.84

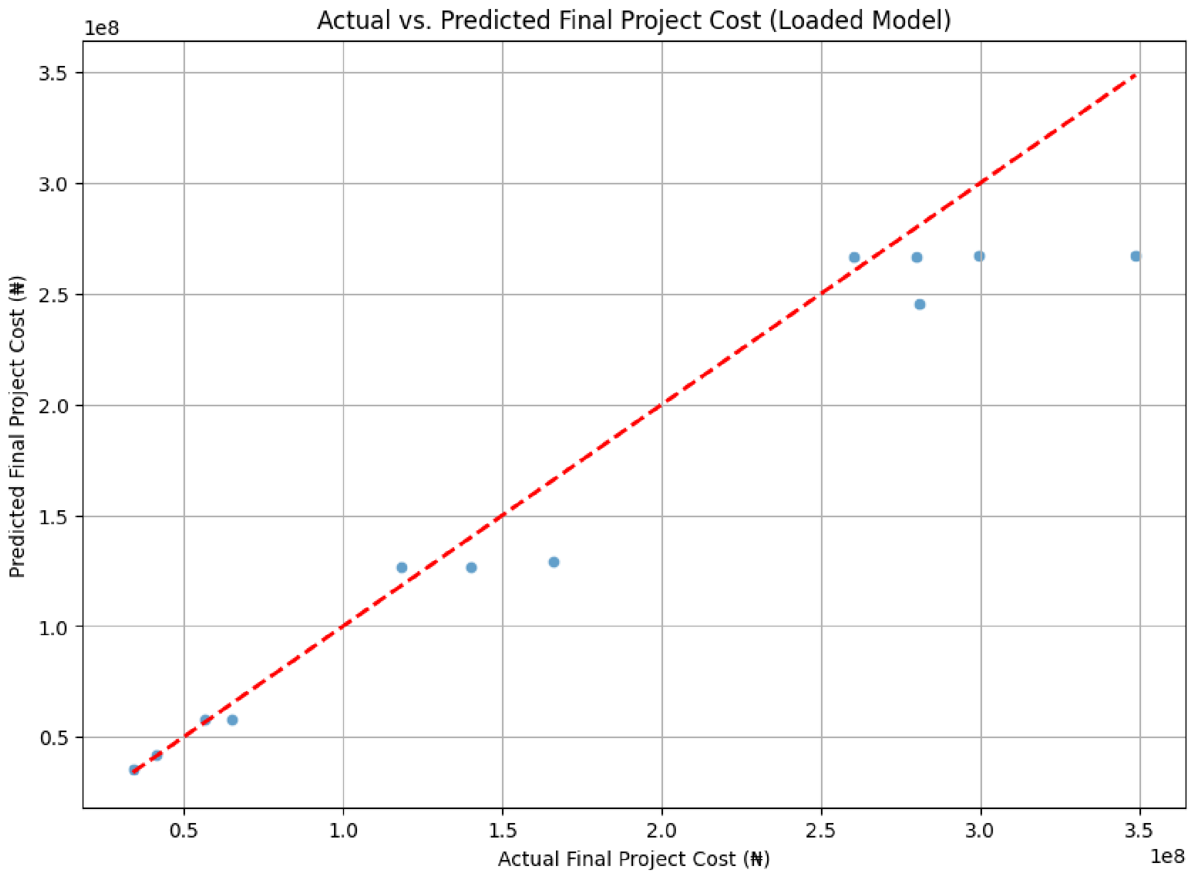

Figure 1. Comparison of actual and predicted final project costs, showing strong alignment with the ideal prediction line and minor underestimation for high-cost projects.

In Table 2, the chosen low learning rate (0.01) suggests that the model benefits from incremental learning and an indication of the need to avoid overfitting given that the dataset is small (59 projects). It mitigates the risk of overestimation and improving generalization across various infrastructure project datasets. The limited tree depth (max_depth = 3) indicates that cost and schedule overruns are more effectively elucidated by relatively straightforward factors, making it most appropriate for delineating the fundamental linkages between project parameters and these overruns. Simultaneously, the increased number of estimators (300) offsets the reduced learning rate, enabling the ensemble model to discern stable patterns and nonlinear correlations through repeated boosting. The Grid Search-optimized model in Table 3 attained an R^2 of 0.76, indicating that approximately 76% of the variance in cost and schedule overruns in infrastructure projects is explained. This degree of explanatory power is deemed robust in the realm of infrastructure projects, where project outcomes are influenced by numerous unknown technical, financial, and environmental factors. The RMSE of 5.68 indicates the model's average magnitude of prediction error. The inherent volatility of infrastructure project costs and timetables implies that forecasts are reasonably good. The MSE value of 32.32 further substantiates that severe prediction deviations are constrained, reinforcing the model's stability. The Mean Absolute Error (MAE) of 3.84 indicates that, on average, expected overruns differ from actual values by less than 4 units (e.g., percentage points, months, or cost indices, depending on the measurement). This illustrates practical use for preliminary forecasting, budget modifications, and anticipatory project control. Figure 1, illustrates a robust positive correlation between actual and expected costs, signifying that the model effectively captures the fundamental cost trends in infrastructure projects. The majority of data points are concentrated near the reference line, indicating strong prediction accuracy and uniformity across various project cost ranges. The graph illustrates that the suggested data-driven approach yields dependable and somewhat precise cost forecasts, with little underestimating at the higher cost extremes.

The findings validate the appropriateness of data-driven machine learning methodologies for forecasting cost and schedule variances in infrastructure projects. In contrast to conventional deterministic or judgment-based forecasting techniques, the proposed model has a greater capacity to elucidate intricate, nonlinear interactions among project variables. The comparatively high R^2 value underscores the importance of data-driven insights for understanding overrun behavior, while the low MAE reinforces the model's applicability for operational decision-making. These findings indicate that early detection of potential overruns enables project managers and policymakers to implement proactive mitigation measures, including contingency planning, resource reallocation, and schedule optimization. The model functions as a decision-support tool for infrastructure institutions, facilitating risk assessment and budgeting by delivering reasonably accurate early warnings of potential overruns, thereby enabling project managers to allocate contingency funds more efficiently or implement preventive measures. Theoretically, the work contributes to the existing literature by incorporating machine learning methodologies into project management and construction finance.

6. Conclusion

The findings indicate that the proposed data-driven model provides a robust and reliable method for forecasting cost and schedule overruns in infrastructure projects. The work enhances methodological rigor and practical relevance by integrating optimal hyperparameters, multi-metric evaluation, and cross-validation, thereby underscoring the significance of machine learning in contemporary project management. The shown predictive performance indicates that machine learning models might facilitate evidence-based project governance, especially in public infrastructure delivery, where cost and schedule overruns have considerable socio-economic consequences. Policymakers may utilize these models to enhance project evaluation, oversight, and accountability systems, while practitioners can employ them for real-time performance assessment and risk mitigation.

References

Abdelalim, A. M., Salem, M., Salem, M., Al-Adwani, M., & Tantawy, M. An Analysis of Factors Contributing to Cost Overruns in the Global Construction Industry. *Buildings*, *15*(18), 1–22, 2025, https://doi.org/10.3390/buildings15010018

Andrić, J. M., Lin, S., Cheng, Y., & Sun, B. Investigating the possible regression functions for modelling delays in infrastructure projects in South Asia. *KSCE Journal of Civil Engineering*, *29*(9), 1–12, 2025, https://doi.org/10.1016/j.kscej.2025.100209

Attar, P., Kanekar, P., Varsi, A., & Sayyad, S. Integrated framework for contractor selection using fuzzy TOPSIS and gradient boosting machine in construction industry. *Asian Journal of Civil Engineering*, 1–19, 2025.

Gómez-Cabrera, A., Cortés, S., Rojas, J., Sánchez, O., & Torres, A. Data-Driven Analysis of Contracting Process Impact on Schedule and Cost Performance in Road Infrastructure Projects in Colombia. *Buildings*, *15*(3739), 2025. https://doi.org/10.3390/buildings15203739

Ismail, M. Z., Ramly, Z. M., & Adul, R. Systematic Review of Cost Overrun Research in the Developed and Developing Countries. *INTERNATIONAL JOURNAL OF SUSTAINABLE CONSTRUCTION ENGINEERING AND TECHNOLOGY*, *12*(1), 196–211, 2021.

Lekraik, M. J. M., & Ojekemi, O. S. Advancing Digital Project Management Through AI : An Interpretable POA-LightGBM Framework for Cost Overrun Prediction. *Systems*, *13*(1047), 1–21, 2025.

Love, P. E. D., Edwards, D. J., & Irani, Z. Moving Beyond Optimism Bias and Strategic Misrepresentation : An Explanation for Social Infrastructure Project Cost Overruns. *IEEE Transactions on Engineering Management*, *59*(4), 560–571, 2012, https://doi.org/10.1109/TEM.2011.2163628

Melaku Belay, S., Tilahun, S., Yehualaw, M., Matos, J., Sousa, H., & Workneh, E. T. Analysis of Cost Overrun and Schedule Delays of Infrastructure Projects in Low Income Economies: Case Studies in Ethiopia. *Advances in Civil Engineering*, (4991204), 1–15, 2021, https://doi.org/10.1155/2021/4991204

Özkaya, B., Dikmen, F., Demir, A., Raza, M. O., Alsubai, S., & Osman, O. Harnessing machine learning to mitigate water pollution in support of climate action. *Discover Artificial Intelligence*, *6*(10), 1–16, 2026.

Pedron, J. M. O., Gonzales, D. R., Silva, D. L., Villaverde, B. S., Adina, E. M., Gacu, J. G., & Monjardin, C. E. F. A Strategic AHP-Based Framework for Mitigating Delays in Road Construction Projects in the Philippines. *Future Transportation*, *5*(80), 1–34, 2025.

Plebankiewicz, E. Model of Predicting Cost Overrun in Construction Projects. *Sustainability*, *10*(4387), 2–14, 2018. https://doi.org/10.3390/su10124387

Precious, D. Infrastructure project cost overrun and schedule delay in Ghana: Is it an issue of resource misallocation or financial constraints? *Project Leadership and Society*, *6*(100188), 1–11, 2025, https://doi.org/10.1016/j.plas.2025.100188

Sahu, P., Bera, D. K., Parhi, P. K., & Kandpal, M. SMART DELAY PREDICTION : SUPERVISED MACHINE LEARNING SOLUTIONS FOR CONSTRUCTION. *JOURNAL OF MECHANICS OF CONTINUA AND MATHEMATICAL SCIENCES*, *20*(6), 154–167, 2025.

Shafaay, M., Alqahtani, F. K., Alsharef, A., & Chen, G. Modeling construction cost overrun risks at the FEED stage for mining projects using PLS-SEM ABSTRACT. *Journal of Asian Architecture and Building Engineering*, 1–17, 2025, https://doi.org/10.1080/13467581.2025.2481242

Sourav, M. I., Islam, M. R., Rahman, S. M., & Jahan, I. Heterogeneity in stakeholder ' s perceptions on delays in infrastructure projects : scenario of Bangladesh. *Engineering, Construction and Architectural Management*, *32*(6), 0969–9988, 2025, https://doi.org/10.1108/ECAM-04-2023-0330

Yupari Bravo, C. R., & Rodriguez Mogollon, W. O. Identification of Delay Causes in Peruvian Construction Projects: An Expert AHP Approach. *Revista Ingenieria de Construccion*, *40*(2), 1–9, 2025, https://doi.org/10.7764/RIC.00153.21

Zhang, J., Yuan, J., Mahmoudi, A., Ji, W., & Fang, Q. A data-driven framework for conceptual cost estimation of infrastructure projects using XGBoost and Bayesian optimization. *Journal of Asian Architecture and Building Engineering*, *24*(2), 751–774, 2025, https://doi.org/10.1080/13467581.2023.2294871

Biographies

Akinlo Olorunju Mogbojuri is a Postdoctoral Fellow in the Industrial Engineering department and Institute of System Science, Durban University of Technology, South Africa. He received his Bachelor's and master's degrees in industrial engineering from the University of Ibadan, Nigeria, and his Doctorate in Industrial Engineering from the Durban University of Technology, South Africa. His area of interest focuses on operations management, project management, operations research, optimization, inventory management, and transportation. His research profiles include https://orcid.org/0000-0002-1615-0842. and SCOPUS ID: 57469053200. He also has relevant experience in research and community services.

Prof Oludolapo Akanni Olanrewaju He is the Interim Director, Institute of System Science, and the Head of Department of Industrial Engineering, Durban University of Technology, Durban, South Africa. He earned his BSc Honours in Electrical Electronics Engineering and MSc in Industrial Engineering from the University of Ibadan, Nigeria, and his Doctorate in Industrial Engineering from the Tshwane University of Technology, South Africa. He has co-authored more than 150 publications which include journals, conference proceedings and book chapters. He is a recipient of awards both locally and internationally, is an associate member of the Southern African Institute of Industrial Engineering (SAIIE) and NRF rated researcher in South Africa. His research profiles include https://orchid.org/0000-0002-3099-9295 and Olanrewaju, O. A. – Author details – Scopus Preview among others. Area of Expertise or Research and Innovation Areas: not limited to energy/greenhouse gas analysis/management, life cycle assessment, application of artificial intelligence techniques, and 3D Modelling.