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Evaluating the correlation between project selection criteria and organizational performance within the construction industry

Muhammad Ali Musarat [a,b], Ahsen Maqsoom [c], Muhammad Hassaan Naeem [d], Fahim Ullah [e], Alaa Salman [f], Wesam Salah Alaloul [a,*], Hafiz Zahoor [g]

[a] Department of Civil and Environmental Engineering, Universiti Teknologi PETRONAS, Bandar Seri Iskandar, Perak 32610, Malaysia
[b] Offshore Engineering Centre, Institute of Autonomous System, Universiti Teknologi PETRONAS, Bandar Seri Iskandar 32610, Malaysia
[c] Green Tech Institute, University Mohammed VI Polytechnic, Benguerir, Morocco
[d] Department of Management Sciences, COMSATS University Islamabad, Wah Campus, Wah Cantt 47040, Pakistan
[e] School of Surveying and Built Environment, University of Southern Queensland, Springfield 4300 QLD, Australia
[f] Department of Civil and Construction Engineering, Imam Abdulrahman Bin Faisal University, Dammam 34212, Saudi Arabia
[g] College of Civil Engineering, National University of Sciences and Technology, Risalpur Campus, Nowshera 24080, Pakistan

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ABSTRACT

The project selection criteria are required for an effective project lifecycle, and the selected projects should correspond with organizational aims and objectives; yet, the organization lacks severely in its ability to act decisively on the problem. Hence, this study aims to highlight the best project selection criteria that are related to organizational success. In this manner, a quantitative survey approach was used, with closed-ended questions distributed to employees in Pakistan's construction industry. The relationship between project selection criteria and organizational performance was evaluated using structural equation modelling in SmartPLS through measurement and structural models. The findings reveal that a significant positive correlation was found for all the project selection criteria, except for the financial criteria. Furthermore, the results demonstrate that project selection criteria are critical for organizational success; hence, the findings will assist organizations in making better project selection decisions.

1. Introduction

Organizations choose projects based on the many potential prospects that is why it is regarded as one of the most difficult decisions to make [1]. There are various aspects associated with project selection, such as cost, financial, and time-based criteria [2] and any mistreatment may result in an outbreak of an obstacle [3,4]. An organization's project selection problems develop when there are inadequate resources to take advantage of; hence, project selection criteria are devised to select the cost-effective projects [5,6]. A significant part of project management-related research revolves around organizational performance [7] which is critical for the success and survival of today's numerous commercial and economic operations due to market rivalry for cash, consumers and inputs [8]. Organizational performance is central to today's industrial activity [7,9] and is considered a collection of all the businesses accomplishments which are then committed towards a structural goal for organizations in a given period. The notion of organizational performance is linked with the persistence and achievements of a firm [8,10] where several constructs have been linked and studied afterwards [11]. Organizational performance measures comprise several financial measures including budgeting, cash flow cash flow, cost-cutting, and profitability [12].

The criteria used to select projects can vary depending on the organization's goals, industry, and available resources. The relationship between project selection criteria and organizational performance is complex and multidimensional [13,14]. The influence of project selection on organizational performance has been studied in various fields, including information technology, engineering, and construction. A few studies suggest that selecting projects based on strategic alignment and financial feasibility can improve project outcomes and overall organizational performance [15], while other studies have found that selecting projects based on risk and organizational capability can lead to better

* Corresponding author.
E-mail addresses: ali.musarat@utp.edu.my (M.A. Musarat), Ahsen.MAQSOOM@um6p.ma (A. Maqsoom), SP20-RPM-007@cuiwah.edu.pk (M.H. Naeem), Fahim.ullah@unisq.edu.au (F. Ullah), akalobaidi@iau.edu.sa (A. Salman), wesam.alaloul@utp.edu.my (W.S. Alaloul), hafiz.zahoor@mce.nust.edu.pk (H. Zahoor).

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project outcomes and performance [16]. Hsu [17] investigated the relationship between project selection and organizational performance in the construction industry and found that project selection criteria, such as financial viability, strategic fit, and technical feasibility, had a significant impact on project success. Similarly, Lind and Culler [18] investigated that the effect of project selection on the performance of information technology projects and found that effective project selection was positively associated with project success and organizational performance. Beldek, et al. [19] studied the financial, social, technical, and risk criteria in the context of Turkish industries, however, the study was limited to the number of selection factors. Hence, adding upon on their outcomes, the current research has added two more criteria namely environmental and management support criteria in the context of Pakistani industries as supported by Bhatti, et al. [11].

Project selection criteria change according to the organization's nature, business environment, and domain [20]. That is why, if the process is not inlined, the projects can encounter coordination and administration difficulties. For the organization to carefully select the beneficial projects, several analysis steps are required [21]. Furthermore, the selection criteria should also focus on organizational decision-making capabilities, namely resource and value management. These management talents help to achieve organizational performance goals by optimizing resources and creating competitive value [22,23]. An efficient and effective approach towards governance management paves a path for the organizational mechanisms to safeguard their growth [24]. The assessment, prioritization, and selection of projects is a difficult issue, particularly in project-based associations where it is needed to evaluate a bunch of proposals seeking controlled assets such as spending plans, equipment and labour [25]. A plausible composite project includes a subset of recommendations that can be set up thinking about a few irrefutable limitations on assets [26]. Project selection decisions are complicated, and project managers must respond to them for the project to run efficiently by employing all the resources [27].

The selection of projects can greatly affect the sustained performance of an organization, both in financial and non-financial terms. Projects that align with organizational goals and strategies can signficantly effect the overall business of organization. However, there has been limited research in developing countries on project selection criteria, creating a literature gap that needs to be filled as discussed earlier by Mohammed [28] and Kaswan, et al. [29]. Therefore, the current study aims to assess the influence of project selection criteria on organizational performance, specifically in the construction industry of Pakistan. The project selection criteria make an essential contribution to organizational performance because when projects are strategically aligned with one another, resource utilisation is efficient, profits are generated for the organization, and employees are motivated to improve organizational performance.

Therefore, for this research, six project selection criteria were carefully selected that are: financial, institutional, environmental, technical, risk, and management support. Return on capital and return on net assets have been utilized in several studies related to performance measurement. Various scholars have applied different ways to measure organizational performance [30] such as Delaney and Huselid [31] offered two methods for assessing organizational performance: market and financial performance. The study applies the organizational equilibrium theory to investigate the influence of project selection criteria on organizational performance through empirical observations in the construction industry context. The current study imparts to the empirical literature by utilizing a theoretical model adopted from the organizational equilibrium theory. The subsequent sections offer in-depth insights into constructing the theoretical framework, delving into each variable solely, and examining their interrelationships through a correlational lens.

2. Theoretical development

2.1. Project selection criteria

The selection criteria for a given project are influenced by the organization's kind, the business climate, and the project type [20] where a large number of analysis steps are essential for the organization to carefully identify those projects that will be beneficial [21]. The ability of the company to make resource and value decisions is one of the factors to consider [24]. Because these managerial abilities contribute to optimizing resources and the creation of competitive value, the performance objectives of a company can be reached more successfully [22]. Organizations with efficient and effective governance management can secure their growth and development [8]. Where many proposals for controlled assets, such as finances, equipment, and labour, must be assessed, prioritizing and selecting projects in project-based organizations can be challenging [25]. A few absolute asset constraints can be employed to design a realistic composite proposal comprised of a subset of ideas that are not mutually exclusive [26]. Project managers and higher-level officials must deal with the difficulties of project selection decisions for the process to function smoothly and successfully, making full use of all of the resources at their disposal [27].

An extensive literature base is devoted to project selection problems [25]. It incorporates a few methodologies which consider different parts of the issue. Factors for project choice and different subjective and quantitative task choice models have been discussed in the literature, which are the vital goals of the project undertaking [32]. Uncertainity regarding the affiliation between project selection and organizational performance complicates the problem of forecasting project performance when using traditional prediction methods [33]. Because traditional project selection methods are biased and not accurate as compared to the modern methods as studied by Sabahi and Parast [34].

Further, previous research did not constitute the influence of project selection criteria on organizational performance with numerous project selection criteria involved. Hence, the gap is setting priorities for an extensive literature [25]. There is a lot of discussion in the literature about choosing a project and different quantitative and subjective task choice models, which is the primary goal of advancing the project [32]. Project selection can benefit from Multi-Criteria Decision-Making (MCDM) techniques, which employ several decision-making factors. Several MCDM techniques have been utilized in the literature to achieve the best project selection solution, such as the analytic hierarchy process (AHP) [35], a technique for order performance by similarity to ideal solution (TOPSIS) [36], analytic network process (ANP) [37], Elimination and Choice Translating Reality (ELECTRE) also known as outranking method [38], multi-criteria optimization and compromise solution (VIKOR) [39], data envelopment analysis (DEA) [40] and also preference ranking organization method for enrichment evaluation (PROMETHEE) [41] is extensively discussed.

Environment criteria in the context of project selection are related to the internal and external environment. In this criterion, the foremost emphasis is on the organizational regulations, response to competition, the new industry standards, and customer requirements [42]. Financial criteria are related to the financial aspects of the project selection phase. In this criterion, the major focus is on the project's financial credibility in upholding the organization's returns. Financial criteria contain the benefits information to various assessments including (a) cost ratio, (b) the payback period, (c) the growth rate, (d) the rate of return, and the overall contribution towards profitability [43–45]. Institutional criteria deal with the organizational goals, aids the organization in the competing market, the critical success factors, future success, and functioning. These are some of an organization's expectations after the project selection phase [45,46]. Management support criteria deal with the end-user understanding of the project, support from the top management, support from the middle management, and the overall acceptance of the project. Risk criteria deal with project risks like

technical, structural, size, and cost overruns [45,47,48]. Technical criteria are related to the technicalities which arise in the projects, like availability of the needed technology, availability of skilled personnel, high visibility and transparency in the project, basic subsystem provided, and the simplicity of the project [45,49,50].

2.2. Organizational performance

Performance measurement is critical to a company's success [7], however, enhancing a system without measuring it first is not easy. How well a company does in terms of its market and financial objectives is "organizational performance" [51]. Academics rarely go into great detail about how companies succeed [52], while research has shown that economic and market metrics can also be used to evaluate an organization's performance, such as return on investment (ROI), customer base, and profit margin on sales [53]. Supply chain disruptions significantly impacts the organizational performance [54]. As per previous literature, the efficiency of a team or an individual can be used to determine the overall performance of an organization [55]. Time efficiency can be seen as a step toward accomplishing a goal, such as raising profits. According to Hancott [30], the terms "performance of the organization" and "effectiveness" are synonyms for each other in this context. In addition, the return on total assets, net asset growth, profit margins, return to shareholders, profit margins, number of new items, market share growth, and a range of other performance indicators are listed [30].

The return on capital and the return on net assets have been used in management sciences research in the context of performance measurement. Many academics have used various ways to determine an organization's success [30]. It is possible to analyze financial success and market performance in two different ways [31]. Tippins and Sohi [56] made a case for measuring organizational performance in four dimensions: relative profitability, investment return, total sales development, and customer retention. Project planning [32], performance evaluation [52], training staff [56], project performance [57], and job satisfaction [58] have a significant impact on organizational performance in empirical research. According to numerous research findings, successful human resource management (HRM) directly affects an organization's productivity [59]. Empirical research related to organizational performance examined that project management [32], performance appraisal [52], training personnel [56], project performance [57], and employee job satisfaction [58] had a substantial contribution towards organizational performance. Also, several studies compiled the consequences of effective HRM on organizational performance [59].

3. Research model and hypothesis development

Figure 1 shows the research model in which the Environment criteria, Financial criteria, Institutional criteria, Management support criteria, Risk criteria, and Technical criteria [19] are the independent variables and the organizational performance [60] is the dependent variable. The project selection criteria are important for an organization to uphold its performance and profitability. Bhatti, et al. [11] acknowledged that performance indicators could significantly affect the organization's overall performance. Therefore, it is hypothesized that the project selection criteria impact organizational performance.

3.1. Impact of environmental criteria on organizational performance

Following Rehman, et al. [61] findings, Fürstenberg, et al. [62] proposed that most factors contributing to organizational performance are environment related. Management of conflicts among employees is very important in project selection; it also determines project success [8]. Throughout development, the project faces huge difficulties like ecological, specialized, and board intricacy. Delivering the project deliverables requires the coordination of various groups to streamline different objectives [63]. Conflict can assist with making the representatives more open with one another, assuming they address it fittingly and instantly [33]. It can likewise hurt the group's efficiency and cause lower assurance in the working environment on the off chance that it passed on uncontrolled, which can make pessimistic feelings emerge and contribute towards the dangerous way of behaving, resulting in the poor performance of the overall project [64,65]. Due to unnecessary peer pressure workers often perform their tasks in a lethargic manner which results in conflicts and a destitute organizational environment [66].

Task-related conflicts can also affect the organization long-term, causing multiple performances and efficiency-related issues [67]. Also, assigning the team members roles and responsibilities must be done without indistinctness [52] to avoid conflict and inspire teamwork from the project selection phase to the project end. According to Ho and Systems [51], communication and collaboration while selecting projects are considered important enabling factors for better performance. Ma, et al. [26] argued that "soft communication skills" significantly affect project effectiveness and efficiency, further improving the organizational environment. It has been emphasized that "the relationship and communication between managers and workers should be good and professional so that all the project lifecycle tasks can be conducted effectively and efficiently" [68,69]. A project which is most suitable for the environment of the organization amongst the available options when completed in time has a better chance to meet the organizational

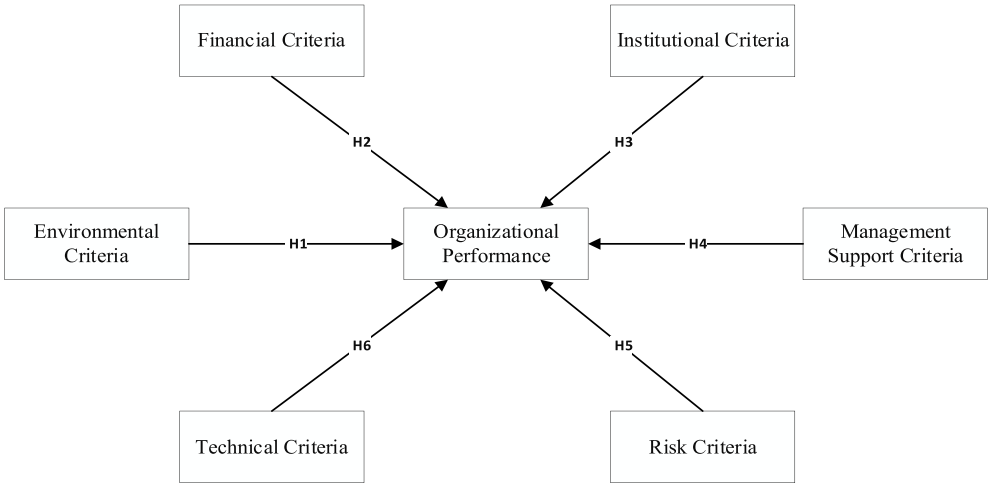

Fig. 1. Research Model.

performance standards and generate profits after deployment [52]. Based on the carried out argument, it is hypothesized that:

H1: Environmental Criteria have a significant and positive association with Organizational Performance.

3.2. Impact of financial criteria on organizational performance

Financial criteria help the organization develop a strategy that aligns with the operative use of project-driven approaches resulting in achieving the goals. According to Kaiser, et al. [25], finances should be dealt with in conjunction with business strategies to satisfy customer needs. Therefore, those projects should be worked upon first, providing maximum financial stability and benefits to the organization [70]. In addition, empirical studies [71,72] indicated that organizational competitiveness and quality of the products and services depend heavily upon effective project selection.

Similarly, Rehman, et al. [61] commented that upon project selection, it should be kept in mind that the projects should relate to the organization's core procedures, address customer issues that they think are critical to quality, and promote and increase revenue growth with cost and time reductions. Projects contributing to the organizational agenda positively contributes to the overall organizational performance. A successful project can set a good example for other projects and improve organizational performance in certain zones (such as efficiency, development, and innovation). Mostly, people involved in the project selection process are selected as sampling units. The main stakeholders regarding project selection are project managers, customers/clients of project and business teams, business heads, financial executives, marketing executives, team leads and owners of organizations working in the construction industry [73]. The above discussion also aligns with the organizational equilibrium theory. Notably, financial criteria have a positive correlation with organizational performance. Thus, it is hypothesized that:

H2: Financial Criteria have a significant and positive association with Organizational Performance.

3.3. Impact of institutional criteria on organizational performance

Project selection is critical for the organization's survival and success because of the uncertainty surrounding it in the modern business environment. The difference between selecting a good or poor project represents the difference between an operational life or death [74]. Subjectivity in the project selection can be reduced by proper modelling, good communication, and considering alternatives, strengthening the organization structure [52]. When decision-making is performed in groups, there is a chance of power instability and biases, but to reduce the effect of these factors organization's executives must realize the benefits of an organized approach [74]. Organizational criteria are responsible for the contribution towards organizational goals/objectives. It also assists a the firm in market competition and helps in internal political decisions for the firms's future success and functioning [45]. As the organizational criteria are fulfilled, it increases the chance of project success, and ultimately organizational performance flourishes [75]. Therefore, it is hypothesized that:

H3: Institutional Criteria have a significant and positive association with Organizational Performance.

3.4. Impact of management support criteria on organizational performance

Employee attitudinal responses such as organizational commitment and job satisfaction are the primary sources of organizational consequences explored in empirical research [69]. Related research highlights the relationship between management and organization at an individual level without further exploring the organizational consequences of those individual attitudes [76]. On the other hand, many researchers have also analyzed the relationship between the responses of employees and outcomes of the managerial and organizational levels of analysis [69,77]. Andrew [52] stated that the satisfaction and commitment of employees to their jobs might positively impact the organizational performance since employees with a high level of job satisfaction and organizational commitment will contribute wholesomely to the organization and will be eagerly working towards common attributes and objectives hence promoting organizational performance. The employee's managerial support is the strength of the employee's feelings towards the organization, confidence in its goals, identification of the organizational values, and an inborn desire to belong to the organization [78]. Hence, employees who are more satisfied and committed to engaging behaviours are more willfully capable of good organizational performance.

Based upon a *meta*-analytic review, Pang and Lu [58] found that performance positively relates to managerial support. An implied response believes a possible relationship exists between the employee attitudinal response and managerial outcome; the reverse also exists [74]. The research of Nikpour [74] in the public sector area empirically states that, if public employee satisfaction and organizational commitment increase, organizational performance will greatly enhance. Different structural fields of knowledge explore vast research areas and are far stretched and influenced by attitudes towards work [52]. Employees attribute to their organization partly due to how employees ensure their treatment as a member of the organization [79]. Management support criteria indicate end-user understanding, collaboration, and obligation to project, top, and middle management support. The psychological attachment and faithfulness to an organization characterize the similarity of in-depth values and beliefs of employee and their organization [73]. These arguments deduce the following hypothesis:

H4: Management Support Criteria have a significant and positive association with Organizational Performance.

3.5. Impact of risk criteria on organizational performance

Due to increased competition among businesses all around the globe, risk management is gaining importance, which is a movement within project management [8,80]. Risks pose a significant threat to the success of any organization across five major aspects: time, cost, quality, customer experience, and transparency in business operations. The impact of risks on time cannot be overstated; project delays and unexpected obstacles can hinder the timely completion of tasks and projects. Similarly, costs are directly affected by risks, leading to budget overruns, resource wastage, and increased expenditures. The quality of products or services may be compromised when risks disrupt the normal workflow or introduce uncertainties in production processes. Additionally, risks can severely harm customer experience by causing service interruptions, delivery delays, or compromising the overall satisfaction of clients. Furthermore, transparency in business operations can suffer as risks may lead to information gaps, miscommunication, or a lack of clarity in decision-making processes. To ensure the smooth functioning of organizations across these key dimensions, effective risk management is crucial [81]. A series of steps concerning risk management includes establishing the context, classifying, investigating, assessing, solving, monitoring, and communicating risks, which allow simultaneous decision-making effectiveness [82,83]. Besides, the contract selection also possesses a substantial impact on the organizational performance [84]. V Siskos [21] stated that project management disasters and related issues could be eradicated if proper explanation and determination processes for these hazards could be done appropriately. According to Sooyoung Choe [85], sustainable profits can be increased by the implementation of risk, which will, in turn, effectively reduce unexpected surprises and effective distribution of resources. Risk management can also improve communication and provide a precise summary of dangers the organization can face, ultimately helping them make better power-making decisions. Risk administration is highly important

in disaster management, building bridges, mechanical, civil, and other engineering fields [86–88]. Consequently, it could be deduced that:

H5: Risk Criteria have a significant and positive association with Organizational Performance.

3.6. Impact of technical criteria on organizational performance

Organizations having a better technological structure have a competitive advantage in achieving better performance [60]. Sirisomboonsuk, et al. [89] explain that technology's presence in an organization as a critical force in the competitive environment enables it to surpass its performance limits. Atkinson [90] explained technology as a grave competitive advantage; this discussion is found widely in economics and management literature. Jiang, et al. [45] claim that advanced technology is one of the critical factor for an organization to achieve long-term profitability. Costantino, et al. [2] stated that for the completion of the technical criteria of a project, it is recommended that project managers in the early stages of a project should examine the success criteria, which will report the requirements of evaluating the projects using simple measures, progress, and maintain communication with key investors for the better utilization and better yield performance. Given these overall arguments for the relationship between technical criteria and organizational performance, it is hypothesized that:

H6: Technical Criteria have a significant and positive association with Organizational Performance.

4. Research methodology

4.1. Research design

The deductive approach was selected for this study, and the survey method approach was used for the collection of data. The statistical tool for this study was the SMART PLS 3; it was used to test all the hypotheses and perform statistical analysis. SmartPLS utilizes Structural Equation Modeling (SEM), a statistical method applied in research to scrutinize intricate relationships among variables. Tailored specifically for Partial Least Squares (PLS) structural equation modelling, SmartPLS proves especially beneficial when researchers aim to investigate complex connections among multiple variables. This approach enables the simultaneous analysis of both observed and latent variables within a unified model. A distinguishing feature of SEM in SmartPLS is its clear differentiation between measurement and structural models. This distinction empowers researchers to evaluate the reliability and validity of measurement instruments through the measurement model while concurrently exploring relationships among latent variables within the structural model, all within a unified analysis. Moreover, SmartPLS offers notable advantages in terms of flexibility. It is recognized for its adaptability to smaller sample sizes and its ability to handle non-normally distributed data. The aim of this research is to identify a minimum variance of 10 % in the endogenous construct with a 95 % confidence level when a maximum of six arrows are directed towards the criterion variable of organizational performance. According to Cohen's rule [91], a sample of at least 129 responses is needed to estimate statistical relationships at 80 % statistical power. Consequently, the survey was administered to the employees working in construction firms in Rawalpindi which yielded 150 valid responses after excluding 10 incomplete or unresponsive responses.

4.2. Measures

Considering the study's requirement, measurements were adopted from the empirical literature. 5-point Likert scale was used defined as 1 = Not Important; 2 = Slightly Important; 3 = Somewhat Important; 4 = Important; 5 = Very Important. The 5-point Likert scale provides a moderate number of response options, preventing respondents from being compelled to choose extreme categories and producing ordinal data that is appropriate for statistical analyses. This scale is widely employed, resulting in consistency across research studies, and it frequently demonstrates good reliability and validity, making it a reliable tool for measuring attitudes and opinions [92]. Jiang, et al. [45] scale was used as a reference to measure environmental (EC), institutional (IC), risk (RC), and technical criteria (TC). Financial (FC) and management support criteria (MSC) were measured using the instrument from Beldek, et al. [19]. Organizational performance was adopted from Perry-Smith and Blum [93]. The items of each construct are described in Table 1 and the questionnaire is attached as Appendix (Table A4) below.

4.3. Data collection

According to research done by Pakistan Credit Rating Agency Limited (PCRA), the construction industry has a substantial influence on the country's GDP, contributing 14.3 % in 2021 and predicted to climb to 14.8 % in 2022. This industry employs 7 % of the worldwide workforce on average. To conduct the survey, the Pakistan Engineering Council (PEC) provided a list of construction enterprises working in the Rawalpindi region and the questionnaire was emailed. The employees were assured that their personal information would not be disclosed to any third party. Also, the data will be used for research purposes only. Purposive sampling was utilized because it is useful in situations where respondents are unable to contribute relevant data [95]. The analysis unit comprises Site Supervisor, Site Worker, Site Engineer, Project Manager, and Construction Manager. The guidelines of Hair, et al. [96] were used to determine the minimum sample required for this study. When employing Partial Least Squares (PLS), the sample size must be equal to or more than ten times the greatest number of indicators used to quantify one construct. As a result, the minimal sample size for this study is 80, because the construct with the most signs is complexity risk. In total 200 questionnaires were sent, and 150 valid replies were obtained, yielding a 75 % response rate.

In Table 2, demographic characteritics such as gender, age, qualification, job experience, employment status, and designation are provided. The first variable is gender, in which 93 % (140 out of 150) of respondents were male, and 7 % (10 out of 150) were female. The second variable is age, with 20 % (30 out of 150) of respondents between 20 and 25 years old, 47 % (70 out of 150) between 26 and 30 years old, 17 % (25 out of 150) between 31 and 35 years old, 13 % (20 out of 150) between 36 and 40 years old, and 3 % (5 out of 150) over the age of 40. The third variable in the table is education. The minimum number of respondents had a matriculation qualification, accounting for 9 % (13 out of 150) of the total, and only 3 % (5 out of 150) had a PhD. The maximum number of respondents had a bachelor's degree, accounting for 60 % (90 out of 150), while the remaining respondents had an intermediate qualification (11 %, 17 out of 150) or a master's degree (17 %, 25 out of 150). The fourth variable is job experience, which shows that 57 % (85 out of 150) of respondents had less than five years of experience, 23 % (34 out of 150) had between 5 and 10 years of experience, 14 % (21 out of 150) had between 11 and 15 years of experience, and only 7 % (10 out of 150) had more than 15 years of experience. The fifth variable in the table is employment status, which shows that 63 %

Table 1
Construct and measures.

Variable	Code	Item	Source
Environmental Criteria	EC	05	[45,94]
Financial Criteria	FC	06	[19]
Institutional Criteria	IC	08	[19,45]
Management Support Criteria	MSC	06	[45,94]
Risk Criteria	RC	05	[45,94]
Technical Criteria	TC	07	[19,45]
Organizational Performance	OP	05	[93]

Table 2
Frequencies and Percentages of Demographic Variables.

Demographics	Frequency	Percentage
Age (in years)	70	46.67
20–25	25	16.67
26–30	20	13.34
31–35	05	03.34
36–40		
Above 40		
Qualification	17	11.34
Matric	90	60.00
Intermediate	2505	16.6703.34
Bachelor		
MS/M.Phil.PhD		
Total Job Experience	34	22.67
Less than 5 years	2110	14.0006.67
5–10 years		
11–15 years		
More than 15 years		
Employment Status	35	23.34
Permanent	1505	10.0003.34
Contractual		
Daily WagesInternee		
Designation	35	23.34
Site Supervisor	30	20.00
Site Worker	3525	23.3416.67
Site Engineer		
Project ManagerConstruction Manager		

(95 out of 150) of employees were permanent, 23 % (35 out of 150) were on a contractual basis, 10 % (15 out of 150) worked on a daily wage, and 3 % (5 out of 150) were interns. The last variable in the table is the designation, with 16.67 % (25 out of 150) of respondents being site supervisors, 23.34 % (35 out of 150) being site workers, 20.00 % (30 out of 150) being site engineers, 23.34 % (35 out of 150) being project managers, and 16.67 % (25 out of 150) being construction managers. This data shows that very few respondents were project managers. Overall, this survey data concludes that most of the respondents were male, had less than five years of experience, were between the ages of 20–25, and were permanent employees.

4.4. Data analysis

PLS-SEM offers a solution for small sample sizes, as it allows for the calculation of the measurement and structural model relationships separately rather than relying on a large number of items [96]. Using ordinary least squares regression, the PLS-SEM algorithm calculates the partial regression relationships in the measurement and structural models separately [97]. In PLS-SEM, the reliability and validity of the scales are assessed in the measurement-model stage. The authors confidently utilized SEM in SmartPLS, owing to its multifaceted advantages. Its capability for moderation and mediation analysis, along with a user-friendly interface, made it accessible for researchers with varying statistical expertise. Moreover, the flexibility in sample size requirements and the ability to compare alternative models enhanced the precision and reliability of the study's findings, making SEM in SmartPLS an indispensable tool for advancing research in the field [98].

4.5. Measurement model estimation

The first step in testing a theoretical model is to assess the measurement model, also known as the outer model. The measurement model enables construct validity assessment and specifies each construct's indicators. All variables in this study have reflective measurement models. The criteria for evaluating a reflective model differ from those for a formative model. When the model is reflective, outer loadings are examined, whereas outer weights are examined for formative models [96]. The reflective model is evaluated based on internal consistency, indicator reliability, convergent validity, and discriminant validity. The evaluation process is different from the formative model, where outer weights are examined.

To assess internal consistency and convergent validity, composite reliability (CR) and average variance extracted (AVE) are examined, respectively. Internal consistency is the first step in evaluating the reflective model. Cronbach's alpha is a traditional approach for assessing internal consistency, which considers the reliability of all indicators. However, PLS-SEM prioritizes individual reliability, making Cronbach's alpha limited in this regard. Thus, composite reliability is used in this research. A benchmark between 0.6 and 0.7 is significant and acceptable, while a value between 0.7 and 0.9 is considered satisfactory [99]. Values above 0.95 are not considered acceptable because such high values suggest that all items of the variable are measuring the same thing, leading to potential issues with construct validity. On the other hand, values below 0.6 indicate poor internal consistency and suggest that the items are not measuring the same construct. Generally, values between 0.7 and 0.9 are considered satisfactory for composite reliability.

According to Hair, et al. [96], Convergent validity refers to the degree to which items are positively related to alternative items that measure the same construct. To establish convergent validity, the average variance extracted (AVE) is used, which is defined as the "constructs associated with the mean value of square loadings." A value greater than 0.5 indicates that the construct captures 50 % of the indicator variance, while values less than 0.5 suggest that there are more errors in the indicators. Discriminant validity is assessed using the Forner-Larcker criterion, cross-loadings, and the Heterotrait-Monotrait ratio (HTMT) (see Appendix A; Tables A1, A2 and A3). The Fornell-Larcker criteria is seen to be more cautious when evaluating discriminant validity. The square root of each variable's AVE is extracted and compared to the correlation of the latent variables in this technique. Indeed, "the square root of each variable's AVE must be larger than its highest correlation with the other variable". This strategy is justified by the fact that a variable should have greater variation with its own indicators than with the indicators of other variables. The results show that all Cronbach's alpha and composite reliability values are above the crucial level. The highest values of Cronbach's alpha and composite reliability are both for IC (0.913 & 0.929), while the lowest values belong to EC (0.774 & 0.836). These values indicate strong internal consistency reliability. Indicator reliability is also evaluated through outer loadings. High values of outer loadings indicate a strong association between a construct's indicators, known as indicator reliability [96].

The results also indicate that all outer loadings are below 0.500, which is acceptable. To determine convergent validity, the average variance is also considered. From the results, it is evident that organizational performance has a higher AVE value (0.670) while environmental criteria have a lower AVE value (0.509). Furthermore, the results show that the square root value of AVE for organizational performance is the highest (0.819). It is evident from these values that the square root value of AVE is greater than the correlation with other variables. Therefore, discriminant validity is established using the Fornell-Larcker criterion.

5. Results

5.1. Structural model estimation

The second step after the reliability and validity of the constructs is to evaluate the results of the structural model. It measures the relationship between the constructs and involves the examination of the predictive capabilities of a model. Structural model assessment is performed in five steps. According to Hair, et al. [96], the first step of the structural model is to assess the issue of collinearity. The second step is the path coefficient, and the third involves assessing R2. The fourth step includes F2, and the last step is to evaluate Q2 of the model. Hypotheses

are tested using path coefficients. The path coefficient's significance level serves as a foundation for retaining or rejecting a hypothesis. PLS-SEM use bootstrapping to assess whether the route coefficients are statistically significant. Bootstrapping is a method of determining the importance of a coefficient based on its standard error findings. T value is evaluated from this standard error as presented in Table 3.

The coefficient is significant only when the t value is greater than the critical value, and for the tail test, the critical value is 2.57 (level of significance 1 %), and 1.96 (level of significance 5 %). Both t and p values are observed to analyze the significance level. The coefficient of determinant R2 is used to measure the structural model. Hair, et al. [96], defined it as a model calculated as the squared correlation between specific endogenous variable actual and predicted value. The range to test R2 is from 0 to 1, where values closer to 1 indicate a higher magnitude of change. From a multivariable regression model perspective, the effect size (F2) allows for the advancement of native effect size, which refers to the effect of one variable. To assess F2, guidelines suggest that an effect size of 0 to 0.15 represents a small effect, while an effect size from 0.15 to 0.3 is considered a medium effect. An effect size greater than 0.3 represents a large effect.

It can be seen in Table 4 (model summary) that all values are significant at a 95 % confidence interval except the financial criteria. The R2 value of 0.836 indicates that 83.6 % of the variance in the endogenous construct of organizational performance is explained by the predictors i.e., project selection criteria. Moreover, the Q2 value is greater than zero suggesting the predictive relevance of the research model of the study.Further,The the path coefficients represent beta coefficients (Table 4). The path coefficient ($\beta = 0.211$) and corresponding t-value (2.727) of environmental criteria are significant. The β value of 0.211 implies that holding all other variables constant, a one-unit change in environmental criteria will result in a 0.211-unit change in organizational performance. However, the f2 value of 0.103 indicates that the effect size for environmental criteria on organizational performance might be small. The findings presented in Table 4 support H1, H3, H4, H5, and H6. Regarding financial criteria (H2), a high p-value of 0.381 and a low path coefficient value of 0.042 indicate an insignificant positive path. Therefore, H2 is not supported.

Table 3
Convergent validity of constructs.

Construct	Indicator	Outer loading	Cronbach's Alpha	rho_A	CR	AVE
EC (5-items)	EC1	0.601	0.774	0.824	0.836	0.509
	EC2	0.807				
	EC3	0.747				
	EC4	0.639				
	EC5	0.751				
FC (6-items)	FC1	0.738	0.816	0.837	0.864	0.516
	FC2	0.640				
	FC3	0.697				
	FC4	0.764				
	FC5	0.663				
	FC6	0.793				
IC (8-items)	IC1	0.752	0.913	0.915	0.929	0.622
	IC2	0.780				
	IC3	0.839				
	IC4	0.795				
	IC5	0.791				
	IC6	0.767				
	IC7	0.848				
	IC8	0.732				
MSC (6-items)	MSC1	0.837	0.876	0.901	0.907	0.620
	MSC2	0.823				
	MSC3	0.759				
	MSC4	0.829				
	MSC5	0.794				
	MSC6	0.670				
RC (5-items)	RC1	0.777	0.856	0.859	0.897	0.637
	RC2	0.840				
	RC3	0.842				
	RC4	0.830				
	RC5	0.690				
TC (7-items)	TC1	0.711	0.882	0.904	0.908	0.586
	TC2	0.734				
	TC3	0.756				
	TC4	0.808				
	TC5	0.794				
	TC6	0.766				
	TC7	0.785				
OP (5-items)	OP1	0.809	0.876	0.881	0.910	0.670
	OP2	0.757				
	OP3	0.839				
	OP4	0.817				
	OP5	0.868				

Note: EC: Environmental Criteria, FC: Financial Criteria, IC: Institutional Criteria, MSC: Management Support Criteria, RC: Risk Criteria, TC: Technical Criteria, OP: Organizational Performance.

6. Discussion

In this study, it was overall hypothesized that project selection criteria would positively influence the organizational performance of a construction firm. Six hypotheses were formulated and tested, and it was found that there is a significant and positive relationship between environmental criteria, institutional criteria, management support criteria, risk criteria, technical criteria, and organizational performance. Therefore, hypotheses H1, H3, H4, H5, and H6 were accepted, leading to the conclusion that project selection criteria positively impact organizational performance. However, the results for financial criteria were found to be insignificant.

In the first hypothesis, it was demonstrated that environmental criteria have a significant influence on organizational performance. The current study's analysis shows that environmental criteria significantly positively affect organizational performance at a 95 % confidence interval which is consistent with the past studies that also reported a significant relationship between the said project selection criteria and organizational performance [26]. Construction firms can enhance their performance and competitiveness by giving priority to environmentally sustainable projects and implementing green practices [100]. Related to the second hypothesis, the results suggest that the influence of financial criteria on organizational performance is insignificant. However, previous research has indicated a significant relationship between project finance and profitable performance. Therefore, despite the lack of significance in this study, it is important for future research to further investigate the relationship between financial criteria and organizational performance in the context of construction projects [90].

The third hypothesis suggests that institutional criteria positively influence organizational performance. The results show that institutional criteria positively affect organizational performance, and the results are significant at a 95 % confidence interval. These findings align with previous studies that have also reported a positive relationship between meeting organizational standards and improved performance [24]. The alignment of construction firms' practices with institutional criteria, including regulatory requirements, industry standards, and governance principles, leads to enhanced organizational performance [101]. By conforming to these criteria, construction firms ensure compliance, promote effective governance practices and achieve overall operational effectiveness.

The fourth hypothesis suggested that management support criteria positively impact organizational performance. The results indicate that management support criteria indeed have a significant positive effect on organizational performance at a 95 % confidence interval. These results are consistent with previous studies that have shown that effective management support and communication can enhance project success and overall organizational performance. Accordingly, strong support from management and clear communication between project teams can lead to better decision-making, improved coordination, and ultimately improved project outcomes [62].

Table 4
Model summary.

N	IV	DV	Path Coefficient (β)	T value	P value	F2	R2	Q2
1	Environmental Criteria	Organizational Performance	0.211	2.727	0.007	0.103	0.836	0.368
2	Financial Criteria	Organizational Performance	0.042	0.877	0.381	0.035		
3	Institutional Criteria	Organizational Performance	0.398	3.624	0.000	0.150		
4	Management Support Criteria	Organizational Performance	0.517	6.363	0.000	0.268		
5	Risk Criteria	Organizational Performance	0.245	2.597	0.010	0.101		
6	Technical Criteria	Organizational Performance	0.276	3.447	0.001	0.113		

Hypothesis five posited that risk criteria would positively influence organizational performance. The results indicate a statistically significant positive relationship between risk criteria and organizational performance at a 95 % confidence interval. These findings are consistent with prior research highlighting the importance of effectively managing risks to improve project outcomes. Specifically, early identification and mitigation of potential risks can help avoid costly delays and disruptions later in the project lifecycle [82]. Through a systematic evaluation of risks during the project selection process, construction firms can take proactive measures to address potential challenges, make well-informed decisions, and ultimately enhance their organizational performance [102].

The sixth hypothesis demonstrated that technical criteria positively influence organizational performance. The results show that technical criteria significantly positively impact organizational performance at a 95 % confidence interval. These findings are consistent with previous studies that report a competitive advantage for organizations with better technological structures in achieving superior performance [60]. Construction organizations that make investments in and effectively utilize advanced technologies can experience increased productivity, cost savings, and improved project outcomes, ultimately leading to a competitive advantage in the market [103].

7. Conclusion

The relationship between project selection criteria and organizational performance is complex and multidimensional. Few studies have investigated this relationship in service industries and identified institutional, financial, risk and technical criteria as key criteria for project selection, however, still, there is a gap in the body of knowledge that has been covered by this work. Hence, this research aimed to investigate the impact of project selection criteria on organizational performance through a quantitative analysis. Based on the assessment, the general significant finding is the positive relationship between project selection criteria and organizational performance, which confirms previous studies' findings emphasizing the crucial role of project selection criteria for individual and organizational performance. Overall, the results support the constructs and validate the positive relationships between the five project selection criteria mentioned above and organizational performance. Only the relationship between financial criteria and organizational performance was insignificant in this study. The findings of this research can aid higher-ups in construction organizations in better project selection for their organizations. This research contributes to previous literature by adding two more criteria namely environmental and management support criteria in the context of the construction industry.

7.1. Implications

This research has various theoretical and practical implications. It is the first study to look at the link between project selection criteria and organizational performance in the fast-developing construction sector. By considering the six project selection criteria as a contributing factor towards organizational performance, the study has added to the existing literature. It is important to select the project based on specific criteria as per the conditions of the economy of a country as well as the resources available, otherwise, the project may face failure and leave a negative impact on organizational performance. To achieve this, managers must follow several steps, including expounding project goals, defining project scope, checking quality standards, and making necessary interpretations to avoid ambiguity and nonconformity from important points. Project managers should be aware of all the project selection criteria and their appropriate use in different situations since each criterion has unique attributes, and some may not be effective in certain organizations.

Several suggestions were provided by researchers that serves as contributing factors in this study. For example, Ahmad [70] suggested that project performance is greatly impacted by the schemes of project selection in different settings. This study also answered the question posed by Sabahi and Parast [34], who suggested that "project managers still need to assess the success of a project concerning time, cost, and quality; further, it is important to identify the determinants of organizational performance from an individual's perspective".

Moreover, this research has identified new metrics that impact organizational performance through different project selection criteria. Therefore, it is critical to ensure that project members exhibit the selection criteria according to their specific requirements across the project selection phase, as discussed in this paper. This is one way managers can ensure that projects achieve their desired outcomes. Lastly, having a comprehensive knowledge of stakeholders' culture is essential to effectively build trust and confidence among external parties.

7.2. Limitations and future studies

One of the limitation of this study is that the questionnaire based data was collected from construction sector only belonging to a developing country, meaning that the findings may not apply to other well-developed countries. Also, this questionnaire was addressed to the employees responsible for key positions at the sites/organizations. However, a significant part of the respondents who replied to the questionnaire were young age and had less professional experience. Though unintended, this may limit the point of view presented in the paper to be representative of younger, less experienced employees. This also shows the willingness of younger employees to participate in such activities compared to experienced and busy professionals. Further as indicated by Ullah, et al. [104] and Ullah, et al. [105], younger employees are more tech-savvy and comfortable in participating in activities such as data collection, hence the findings are not surprising. Nevertheless, future study needs to target the employees with more experience. Another limitation is that this study considered only one aspect of financial criteria i.e., the project cost. Other financial criteria, such as return on investment, may also impact organizational performance and need to be explored in future.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A

Table A1
Fornell-Larcker Criterion Test Outputs.

Indicator	EC	FC	IC	MSC	OP	RC	TC
EC	0.713						
FC	−0.043	0.718					
IC	0.158	0.221	0.789				
MSC	0.186	0.294	0.862	0.787			
OP	0.278	0.233	0.850	0.867	0.819		
RC	0.224	0.269	0.774	0.762	0.793	0.798	
TC	0.059	0.252	0.400	0.371	0.479	0.438	0.765

Table A2
Heterotrait-Monotrait Ratio Test Results.

Indicator	EC	FC	IC	MSC	OP	RC	TC
EC							
FC	0.167						
IC	0.176	0.254					
MSC	0.189	0.324	0.865				
OP	0.294	0.250	0.743	0.889			
RC	0.258	0.302	0.777	0.883	0.814		
TC	0.150	0.295	0.445	0.417	0.542	0.498	

Table A3
Cross Loadings of Constructs.

Indicator	**EC**	**FC**	**IC**	**MSC**	**OP**	**RC**	**TC**
EC1	0.601	−0.111	0.080	0.075	0.118	0.106	−0.056
EC2	0.807	0.001	0.106	0.153	0.231	0.144	0.151
EC3	0.747	−0.103	0.034	0.054	0.136	0.073	−0.048
EC4	0.639	−0.098	0.029	0.068	0.113	0.089	−0.003
EC5	0.751	0.036	0.212	0.213	0.284	0.278	0.059
FC1	−0.189	0.738	0.191	0.193	0.108	0.195	0.178
FC2	0.003	0.640	0.079	0.138	0.095	0.109	0.149
FC3	−0.040	0.697	0.043	0.096	0.129	0.089	0.189
FC4	−0.003	0.764	0.238	0.305	0.208	0.221	0.179
FC5	−0.057	0.663	0.155	0.198	0.154	0.221	0.171
FC6	0.024	0.793	0.181	0.253	0.230	0.255	0.211
IC1	0.082	0.059	0.752	0.620	0.662	0.542	0.369
IC2	0.180	0.168	0.780	0.704	0.746	0.586	0.276
IC3	0.121	0.186	0.839	0.670	0.609	0.619	0.283
IC4	0.131	0.205	0.795	0.663	0.654	0.593	0.344
IC5	0.122	0.171	0.791	0.666	0.630	0.625	0.283
IC6	0.097	0.195	0.767	0.703	0.654	0.634	0.353
IC7	0.200	0.185	0.848	0.717	0.740	0.709	0.328
IC8	0.046	0.226	0.632	0.688	0.638	0.568	0.289
MSC1	0.146	0.225	0.692	0.837	0.759	0.631	0.347
MSC2	0.218	0.240	0.648	0.823	0.680	0.603	0.284
MSC3	0.190	0.264	0.623	0.759	0.587	0.586	0.291
MSC4	0.106	0.269	0.682	0.829	0.665	0.617	0.262
MSC5	0.159	0.287	0.591	0.794	0.601	0.671	0.353
MSC6	0.045	0.089	0.538	0.670	0.588	0.477	0.197
OP1	0.193	0.171	0.707	0.648	0.809	0.592	0.434
OP2	0.168	0.145	0.582	0.659	0.757	0.603	0.354
OP3	0.274	0.182	0.681	0.689	0.839	0.694	0.383
OP4	0.281	0.223	0.722	0.698	0.817	0.651	0.402
OP5	0.217	0.225	0.772	0.653	0.868	0.702	0.386
RC1	0.295	0.141	0.587	0.570	0.648	0.777	0.270
RC2	0.184	0.272	0.649	0.613	0.669	0.840	0.426
RC3	0.243	0.223	0.609	0.593	0.667	0.842	0.412
RC4	0.114	0.199	0.624	0.614	0.593	0.830	0.396
RC5	0.037	0.240	0.622	0.659	0.476	0.690	0.231
TC1	−0.005	0.346	0.256	0.294	0.358	0.310	0.711
TC2	0.098	0.180	0.291	0.283	0.397	0.345	0.734
TC3	−0.012	0.123	0.330	0.239	0.325	0.277	0.756
TC4	0.034	0.291	0.261	0.260	0.344	0.299	0.808
TC5	0.000	0.150	0.274	0.315	0.368	0.300	0.794
TC6	0.110	0.131	0.343	0.280	0.352	0.376	0.766
TC7	0.079	0.134	0.380	0.307	0.406	0.421	0.785

Note: EC = environmental criteria, FC = financial criteria, IC = institutional criteria, MSC = management support criteria, RC = risk criteria, TC = technical criteria.

Table A4

Questionnaire of the Constructs.

Scale (1 = Not Important; 2 = Slightly Important; 3 = Somewhat Important; 4 = Important; 5 = Very Important)						
1.	*Project Selection Criteria*					
Financial Criteria						
Sr. #		1	2	3	4	5
1	Benefit/cost ratio					
2	Rate of return					
3	Contribution of profitability (e.g., reducing manufacturing cost, minimizing inventory) in project selection?					
4	Growth rate					
5	Payback period					
6	Overall importance of above financial criteria					
Institutional Criteria						
1	Contribution to organizational goals/objectives					
2	The capacity to aid the organization in competing in market					
3	Internal political decisions (e.g., personal preference of decision makers) on?					
4	Organization's future success					
5	Functioning of the organization					
6	Public relations effect (e.g., improve corporate image)					
7	Organization's critical success factors					
8	The overall importance of above organizational criteria					
Environmental Criteria						
1	Required by regulations (e.g., Federal, State)					
2	Response to competition (e.g., response time must be equal or better than competitors)					
3	Required by customers/suppliers					
4	New industry standards					
5	The overall importance of the above criteria					
Technical Criteria						
1	Isolated, simple, and modular project					
2	High visibility of project					
3	Basic subsystem to system					
4	Basic module for operations (e.g., data base system)					
5	Availability of skilled personnel					
6	Availability of needed technology					
7	The overall importance of the above criteria					
Risk Criteria						
1	Technical risk (e.g., degree of knowledge)					
2	Structure risk (e.g., change of organizational structure, procedures)					
3	Risk of cost overruns					
4	Size risk (e.g., Number of parties involved, estimated project time)					
5	The overall importance of the above risk criteria					
Management Support Criteria						
1	Political acceptance					
2	End-user understanding, cooperation, and commitment to project					
3	Top management support					
4	Match with users' interest/workload					
5	Middle management support					
6	The overall importance of the above criteria					
2.	*Organizational Performance*					
Sr. #		1	2	3	4	5
2	Organization achieving the desired profit target (Quality of service and product)					
3	The strategy used by the company has achieved profit (New product, service, and program)					
4	Internal and external factors effect achieving company's profit and loss (Customer and client satisfaction)					
5	Changing in profit or loss affected work performance					

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Wesam Salah Alaloul research interests lie in construction management and automation, BIM and digital twin technology, construction materials, and lifecycle cost assessment. Additionally, he is a certified PMP and a trainer for construction costing and sustainability issues. Currently he is Associate Professor at the civil engineering University of Technology Petronas, with 20 years of experience in both industry and academia and served as a member of various evaluation committees for development and research project. He has also published numerous research papers in international conferences and reputable journals.