Critical Success Factors (CSF) of Construction Projects: A Case of Housing Projects in Pakistan

Burhan Sami* Ahmed Saeed Minhas** Usman Ahmad***

Abstract

This study examines the Critical Success Factors of housing projects in Karachi due to its unique geographic and industrial environment. This will be done by focusing on this demographic and thus enabling a more thorough and pertinent analysis. In this instance, the sample population consists of project management team personnel in the construction firms of Karachi. This study employed a purposive sampling and a survey approach on CSFs in Karachi housing developments. Partial Least Squares Structural Equation Modelling (PLS-SEM) is the data analysis technique. The sample size consists of 204 participants. The results have shown that business/work environment-related factors, client-related factors, contractor-related factors, design-related factors, project management-related factors, and procurement-related factors positively affect project success. In contrast, project manager-related factors positively and significantly affect project success. Construction companies must prioritize efficient project management techniques; also, businesses should invest in project managers with the necessary training and expertise to successfully plan, schedule, allocate resources, and communicate.

Keywords: Critical Success Factors (CSF); project success; housing schemes; Pakistan; PLS-SEM.

JEL Classification: O22, L74, M19

1. Introduction

The planning, design, execution, and administration of infrastructure and buildings are all included in the construction sector, which is a crucial pillar of the world's economy. It is essential for promoting economic expansion, urban growth, and job creation. This diversified industry meets various demands with impressive buildings and vital transit systems (Sayidganiev et al., 2022). The building sector is indeed getting on with the flow of new technology, stakeholders, and environmental regulations because an innovative nature

*PhD Scholar, Management Sciences DHA Suffa University Karachi,Pakistan.Email : burhansami007@gmail.com
** VC DHA Suffa University, Karachi, Pakistan.Email: ahmedsaeedminhas81@dsu.edu.pk
***Associate Professor, Management Sciences DHA Suffa University,Karachi,Pakistan.Email: Usmanahmadjee87@gmail.com

is necessary for its continuance. However, it does face difficulties, as well. These difficulties include cost management, regulatory compliance, and various environmental factors. As urbanization has rapidly accelerated, the building sector remains at the forefront of forming the contemporary world. It subsequently helps in balancing advancement and preservation (Li et al., 2023).

CSFs of housing projects are the factors that affect CSFs of the housing project success. These factors are significant and decide whether the construction process has achieved its objectives. Characteristics usually include implemented project management, smart buying techniques, respondents' satisfaction, solidified design concepts, required contractors, intelligent project managers and a productive work climate. Researchers mention that all factors placed in this category show an important difference in terms of the project's success or failure (Ali et al., 2023; Kumar et al., 2024; Wu et al., 2023; Zanjirchi & Moradi, 2012). Housing projects in Pakistan could improve their chances of completion on time, within budget, and to quality standards if they appropriately handle these critical success factors. Over time, this will help expand the construction sector and meet the fundamental housing requirements of the people (Zaman et al., 2022).

Several project areas can affect the CSFs, including project management and its manager, procurement, clients, design, contractors, and the company or work environment. Kumar et al. (2024) noted that the totality of these factors ultimately determines a project's outcome. Completing timely, cost-effective, and excellent-quality work is directly correlated to the level of meticulous project management. With this well-coordinated utilization of resources and procedures, everything can succeed while constructing any building (Bilir, 2022).

Since they affect resource efficiency and accessibility, procurement factors are essential. Strategic purchases of goods and services may reduce costs and streamline operations (Rafeh et al., 2023). Client-related indicators, especially those highlighting happy customers and open communication, also affect project performance. Happy clients indicate job performance, relationship building, and confidence (Oni et al., 2023). Long-term project profitability requires sustainable, efficient, and attractive design. Project managers' skills and contractor management affect success (Ismail et al., 2022). The firm and workplace shape the project's operational backdrop. This includes market dynamics and regulatory compliance. Pakistani housing projects can succeed in the competitive construction industry by optimizing seven linked CSFs (Malik, 2023).

The housing project sector has benefited from Pakistan's urbanization. The housing sector faces opportunities and dangers from rising low-cost home demand (Hussain et al., 2022). Government housing programs stimulate investment and new buildings to address the housing crisis. The business faces legislation, infrastructure, and site acquisition issues

(Hasmori et al., 2023). Pakistani housing and building projects face many challenges that could derail their success. These issues often include bureaucracy and complicated regulations. Licenses and permissions may take a long time under these conditions. Unfortunately, political instability in this country might cause market volatility. Ever-changing government rules are another issue (Khan et al., 2023a).

Material cost increases and supply chain delays can generate severe procurement challenges, affecting project timelines and budgets. Insufficiently skilled construction workers may also cause project delays and lower quality. This is widespread in underdeveloped nations like Pakistan due to unskilled labour (Akhtar et al., 2022). Risks to personnel and project outcomes result from a lack of strict enforcement of safety rules. Deficits in infrastructure, such as inadequate transportation and utility systems, can also affect project logistics and raise costs. Sustainable practices should be considered due to environmental factors, including pollution and lack of water, yet they can be challenging to implement (Somsopon et al., 2022).

The failure of project management and communication to meet the preferences and expectations of the client might lead to a problematic situation. Corruption and unethical behavior are other enemies of the company's projects since they cause significant increases in expenses and damage the integrity of the projects (Navaratnam et al., 2022). As a result of the fact that construction projects are vulnerable to natural disasters like earthquakes and floods, engineering and design standards are pretty stringent. Alterations in the value of a project's currency or the state of the economy may impact the project's feasibility and the funding available (Yu & He, 2022).

There is a dearth of thorough analysis in the existing literature on critical success factors (CSFs) in housing projects in Pakistan. Especially those that take into account the interdependence of project management-related factors, procurement-related factors, client-related factors, design-related factors, contractor-related factors, project manager-related factors, and business/work environment-related factors (Ahmad et al., 2022; Iqbal et al., 2023; Zaman et al., 2022). This paper addresses that gap by providing a complete analysis of these CSFs and how they affect project performance in the specific context of housing projects. Specifically, the paper focuses on Pakistan. In order to provide a more comprehensive picture, the PLS-SEM method will be utilized to analyze data. This strategy will provide a quantitative and integrative perspective (Haris & Yang, 2023).

In order to contribute to a more thorough understanding of project success in the construction industry, this study aims to examine the connections among CSFs in housing projects in Pakistan, specifically in Karachi. Hence, the research question for this study is:

RQ: What are the critical success factors (CSFs) influencing project success in housing developments in Pakistan, particularly in Karachi?

Furthermore, the primary motivation behind this research is the urgent need for cost-effective and environmentally friendly housing options in Pakistan's increasingly urbanizing environment. Finding and comprehending the CSFs that are unique to housing projects is crucial. Since the country struggles with a housing shortage and a growing urban population, by efficiently addressing these issues, Pakistan's urban population may live better lives, and the building industry can prosper. Additionally, this study fills a vacuum in the literature by providing a quantitative, comprehensive analysis of the aforementioned CSFs. Also, it shall offer helpful information to policymakers and other stakeholders.

2. Literature Review

2.1 Stakeholder theory

Stakeholder theory reflects a fundamental change in how organizations see and engage with their stakeholders. R. Edward Freeman first proposed it in the early 1980s. Freeman's work created the foundation for this idea. It was introduced initially in his book of 1984 "Strategic Management: A Stakeholder Approach" (Freeman, 1984). Stakeholder theory refutes the traditional opinion that the main function of a corporation is to maximize shareholder wealth (Dmytriyev et al., 2021). An inclusion of the view that business corporations should not stop at only the employees as it argues that workers are not the only ones who matter in the corporation anyway. Stakeholder might be the reason for their support or influence, involve their decisions or actions. Corporate stakeholders are the staff, customers, suppliers, and local government (Freeman, 1984).

Having recourse to this theory, the decision-making of the organization will consider and balance through different alternatives on which decision is to be made, determine the organization's values. The main features of decision-making are to consider consumer's interests and expectations (Freeman et al., 2020). It emphasizes strongly in identifying stakeholders and comprehending their viewpoints. Also, it involves actively interacting with these stakeholders to create relationships that benefit both parties (Phillips et al., 2003). The theory explains how to be fair in treating stakeholders and also ensuring that their interests are harmonized. It also encourages companies to build profits for all stakeholders. This would focus on sustainable and environment-friendly business activities(Freeman, 1984).

2.2 Theoretical Connectivity

Stakeholder theory reveals the point of view of CSF parameters integration in residential construction. The approach asserts that companies have many stakeholders who

interlink through complicated network trees that shape project planning and implementation (Zanjirchi & Moradi, 2012). Clients who plan and fund housing developments are pivotal to their success. According to stakeholder theory, clients set the project's requirements, expectations, and desired outcomes, making them as essential stakeholders. Thus, project success depends on client needs, preferences, and happiness. Project success and stakeholder interactions depend on client-related traits like communication, responsiveness, and meeting expectations (Mashali et al., 2023; Wu et al., 2023).Second, contractors build buildings. Therefore, they are also most definitely essential to housing developments. Stakeholders view contractors as having direct control over project outcomes. As a result, procurement, resource distribution, and project management directly impact clients (Samwel et al., 2023). Stakeholder theory promotes aligning contractor interests with project goals, communicating, and cooperating to maximize project performance (Kumar et al., 2024).

Project managers settle disagreements between project partners, coordinate tasks, distribute resources, and ensure project completion. According to stakeholder theory, project managers arbitrate between stakeholders' competing interests to accomplish their projects. Leadership ability, effective communication, and good decision-making skills are the top project manager traits that support project success and build stakeholder trust (Zanjirchi & Moradi, 2012). The stakeholder theory insists that project outcomes must comply with project objectives, user needs, and local preferences of the community. Stakeholder participation at the initial stages of the design process can raise user satisfaction, eliminate disputes, and improve the welfare of all the project stakeholders (Kumar et al., 2024).

Finally, stakeholder theory provides a comprehensive framework for understanding the interplay of variables in housing development's CSFs (Samwel et al., 2023). Policymakers and practitioners can design holistic project management strategies encouraging stakeholder participation, cooperation, and value creation (Mashali et al., 2023). The construction industry would benefit from the implementation of sustainable development and successful projects. Contractors, project managers, clients, and building design specialists should be seen as stakeholders. Their goals, hobbies, and relationships with them must be considered (Samwel et al., 2023; Wu et al., 2023).

2.3 Project Success

Housing projects are most successful when various outcomes and indicators demonstrate that project goals have been met and all stakeholders are satisfied. The degree to which a project is accomplished within schedule and budget restrictions is also considered a crucial factor in its success. Project success depends on timely completion because postponements can raise expenses and stakeholders' frustration/dissatisfaction (Mashali et al., 2023). Continuing from the above point related to rising expenses, cost-effectiveness is another aspect determining project success. It is supposed to stay within the

allocated budget. Cost overruns threaten financial viability. It strains resources and destroys stakeholder confidence (Samwel et al., 2023). The housing project's success depends on quality, particularly adhering to quality standards and specifications during construction. Project success depends on construction quality. It guarantees that dwelling units are durable, functional, and attractive, matching residents' needs (Kumar et al., 2024).

Customer satisfaction measures how happy the project's clients, homeowners, and end users are with the finished product (Samwel et al., 2023). A project's design, facilities, and aesthetics affect stakeholder perception and customer satisfaction. Another factor in project success is stakeholder engagement, which assesses stakeholders' involvement and activity throughout the project's lifecycle. Stakeholder management, teamwork, and communication improve project success (Wu et al., 2023). The housing project's long-term viability and sustainability are additional things that should be considered. The longevity of a project is impacted by factors such as energy efficiency, environmental impact, and maintenance. An essential factor in the success of a project is the overall impression and status of all partners. These actions influence both the organization's future and public perception of it. (Kumar et al., 2024; Zanjirchi & Moradi, 2012).

2.4 Development of the hypotheses

Project management-related factors play a pivotal role in ensuring the success of projects across various industries. Effective project management encompasses a range of practices and strategies that contribute to project success. One critical aspect is meticulous planning, which involves defining project objectives. Bilir (2022) noted that a well-defined project plan serves as a roadmap, which helps guide project teams toward achieving their goals efficiently. Muhammad et al. (2022) highlighted that on the other hand, project managers not only manage resources and schedule planning but also make sure that the right manpower, materials, and tools are available whenever needed.

In addition, communication and the involvement of stakeholders are also seen as significant components for the success of their projects (Zaman et al., 2023). Effective communication ensures that every team member gets the needed information while also aligning members and stakeholders with the project's targets and objectives. This will help in eliminating the possibility of misunderstandings and conflicts. Also, risk management is the other main component one essential stage of project management revealed by Hashmi et al. (2022), where identifying and mitigating potential issues contribute to project success. Finally, project Agile or Waterfall, project management methodologies offer ordered schemes that reinforce project management and agility. Therefore, the activities of the project should be synchronized with the constantly changing requirements (Abdulaali et al., 2022). Hence, the following hypothesis is proposed:

H1: Project management-related factors have a positive effect on project success.

Successful procurement contributes to performance positively by helping projects to run the acquisition of necessary resources. It can also assist in cost management and risk reduction. The main thing is supplier selection. A choice of supplier is the main factor that determines the product quality materials and services provided. Based on the findings of Naseer et al. (2022), the right choice will be made by suppliers who adhere to project goals by the provision of top-notch products and services that will boost the project's productivity. In addition, procurement processes could be used to negotiate rates and conditions that are in our favour, providing cost savings. Ahmad et al. (2023) highlighted that efficient procurement practices can reduce project costs through strategic sourcing and contract negotiation.

In addition, sourcing allows managers to handle such risks as a result of early identification at the beginning of the project cycle. Risk assessment alongside risk response planning is made cornerstone by the Project Management Institute (PMI). The time frame for project implementation depends on this process must be given during the procurement, minimizing disruptions (Soltanzadeh et al., 2022). Being sum up, procuring suppliers under contract; cost savings and risk management become important links in the successful project execution that results in its scheduled realization thanks to well-organized use of time and resources (Nanto, 2022; Rejeb & Appolloni, 2022). Hence, the following hypothesis is proposed:

H2: Procurement-related factors have a positive effect on project success.

Clients as the ultimate reason for doing a project should be highly considered. During the inception of the project, the clients are the ones who come up with an idea, a theme, or a proposed concept. Also, the clients set out the path that moves the project in a certain direction. Clients play a crucial role in gauging the success of a project. Often this type of client can have a catalysing effect on the accomplishment of the project by inputting clearly defined and comprehensive objectives, manageable expectations, and consistent support of the entire Implementation Lifecycle of the project (Risso, 2022). The necessity of clients and project teams straightforwardly interact with each other, effectively conducting information exchanges and including the clients' input is indispensable to avoid misinterpreting project needsand any further adjustments. This means of communication prevents scope creep and early deadlines in the process (Arora, 2022).

Client commitment also contributes significantly to project success. Committed clients are more likely to allocate necessary resources, including time and budget. They are willing to invest in the project's success (Hotha, 2023). Additionally, the client's involvement in decision-making processes and issue resolution fosters a collaborative atmosphere. This enhances project efficiency and effectiveness (Salman & Auso, 2022).

Moreover, satisfied clients tend to provide valuable feedback and endorsements. These remarks can positively impact the reputation of the project team and foster even better future opportunities (Khan et al., 2023b). Hence, the following hypothesis is proposed:

H3: Client-related factors have a positive effect on project success.

Excellent organized design is the key to successful project delivery and execution. This target is reached by creating clear guidance and by defining project goals. Among other benefits, good design not only helps convey what the project is meant to do but also guarantees alignment with the expectations of the stakeholders expectations (Weinstein et al., 2023). Similarly, a comprehensive design phase helps us to do the correct risk assessment and risk management. This provides teams with valuable information about impediments they may encounter and encourages them to act proactively and take measures to prevent them (Thompson et al., 2022).

Firstly, a comprehensive design framework helps to develop interpersonal relations and interaction among the various project stakeholders. The newest research revealed that this empowers the group to reach a shared goal in terms of the project requirements (Issa et al., 2023). Such alignments from team members, sponsors, and users will consequently reduce the chances of uneconomical modifications (Elkhatib et al., 2022). Apart from that, design-oriented factors, for instance, are the key to the solution of this problem as well. The existence of a well-formulated design platform translates to efficient resource allocation thereby ensuring that the resources are utilized effectively to achieve the project objectives (Issa et al., 2023). The detailed design as well, helps with planning and sequencing activities to be performed. Consequently, it will help in time management and achieving the project‘s goals without wasting time. Hence the activity phase can help build a platform for a successful execution of a project and achieving this will be possible. Accomplishment of this is possible if they spend attention and time in the design process (Jang et al., 2022). Hence, the following hypothesis is proposed:

H4: Design-related factors have a positive effect on project success.

The contractor’s level of expertise and experience has a considerable impact on the project’s success. An experienced and qualified contractor can adequately manage resources. This type of contractor carries out duties expediently and lessens the likelihood of potential problems. It will eventually result in a more successful project (Farouk et al., 2023). Moreover, the contractor’s ability to maintain a skilled workforce and subcontractors ensures compliance with safety regulations. Also, they will be able to adhere to project schedules, which is critical in achieving project success (Artpairin & Pinmanee, 2023). Secondly, effective communication and collaboration between stakeholders, including contractors, are crucial. A contractor who fosters open and transparent communication with stakeholders can

facilitate a smoother project execution process and address issues promptly (Omotayo et al., 2022).

Furthermore, a contractor's financial stability and resourcefulness are essential for project success. Financially secure contractors are better positioned to manage unexpected costs. Additionally, they can procure quality materials and invest in innovative construction techniques (Watermeyer, 2022). As a result, a capable contractor who excels in these areas can enhance project efficiency, reduce risks, and ultimately contribute to the successful completion of construction projects (Gao, 2022). Hence, the following hypothesis is proposed:

H5: Contractor-related factors have a positive effect on project success.

Project manager-related factors also play a pivotal role in determining the success of a project. Successful project management is not only about task supervision; it means dealing with the wide scope of knowledge and techniques that directly correlate with the project's success or failure. One of the existing studies by Plattfaut (2022)showed that strong leadership contributes to favorable outcomes of projects. This is achieved by influencing the front-line staff, creating concise goals, and resolving disputes smoothly. On the other hand, the communication skills of the project manager have also a lot to offer. Good verbal and written communication assist in describing project purposes and goals to others. These skills also facilitate managing expectations and guide that all the parties involved agree to this process(Chang & Wongwatkit, 2023).

Moreover, the ability to manage risks is vital for project success. A proficient project manager identifies potential threats. Also, s/he develops risk mitigation strategies and ensures proactive risk management throughout the project lifecycle (Bahamid et al., 2022). Time management skills are equally important, enabling the project manager to create and adhere to realistic schedules. This will help avoid delays and cost overruns (Omolloh et al., 2023). Furthermore, a project manager's adaptability and problem-solving capabilities are invaluable in addressing unexpected challenges and changes in project scope. These traits are supported by research conducted by Ciric Lalic et al. (2022). Researchers emphasize the importance of flexibility in project management. Finally, stakeholder engagement and fostering collaboration among team members and external parties are essential for project success (Rankinen et al., 2022). Hence, the following hypothesis is proposed:

H6: Project manager-related factors have a positive effect on project success.

Business and work environment-related factors play a pivotal role in determining the success of projects. Clear and consistent communication channels facilitate the exchange of information. They are simultaneously facilitating the exchange of expectations and feedback. This will ultimately enhance project coordination and minimize misunderstandings (Lee et

al., 2023). Furthermore, a supportive organizational culture fosters employee motivation and commitment. This drives them to go the extra mile to ensure project success (Shamsudin & Velmurugan, 2023). When employees feel valued, engaged, and empowered, they are likelier to take ownership of their tasks and collaborate effectively with team members. Resource allocation and availability are also crucial aspects. Sufficient budget allocation and timely resource provision enable teams to execute tasks without unnecessary delays, ensuring that projects adhere to schedules (Lee et al., 2023).

Access to skilled and well-trained personnel is also essential for task execution and problem-solving. This helps in positively impacting project success (Abdulkadir, 2023). Another significant factor is leadership and management competence. Competent project managers can effectively plan, monitor, and adapt to changing circumstances. Meanwhile, mitigating risks and ensuring project success (Shamsudin & Velmurugan, 2023).

Moreover, an organization's ability to adapt to market changes and embrace technological advancements can enhance project success by promoting innovation and competitiveness. Consequently, these factors enable organizations to optimize their project management practices. It also improves team performance and achieves booming project success (Nawaz & Tian, 2022). Hence, the following hypothesis is proposed:

H7: Business/work environment-related factors have a positive effect on project success.

Research framework

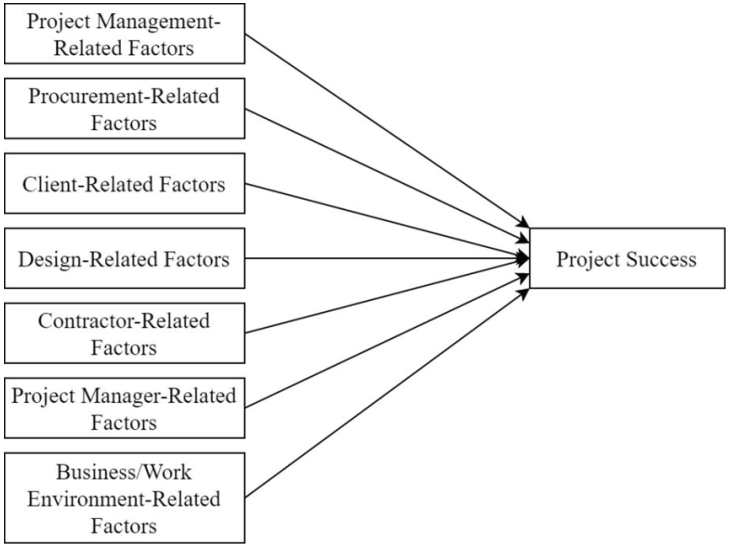

Figure 1: Research Model

3. Methodology

3.1 Research Design

This study employs a quantitative research methodology, relying on numerical data analysis from PLS-SEM, to examine the connections among CSFs in housing projects in Karachi, Pakistan. Furthermore, it follows a deductive approach, beginning with a hypothesis or theory about the relationships among variables and testing this theory using empirical data (Goel, 2007). The explanatory study aims to explain the relationships between various factors and project success in housing developments (Buchanan et al., 2013). Additionally, it adopts a cross-sectional design, as data is collected from project management personnel within construction firms at a single point (Kesmodel, 2018), providing a snapshot of their perspectives and experiences.

3.2 Sample and population

The term "sample population" refers to a specific set of people chosen to participate in a study. The sample population in this instance consists of "Personnel of Project Management Teams in the Construction Firms of Karachi." These people are the ones from whom the research's data will be gathered and then analyzed (Barreiro & Albandoz, 2001).

The research specifically focuses on understanding the CSFs of housing projects in Karachi, Pakistan. This led to selecting the sample population, i.e., project management teams at construction companies in Karachi. The research intends to collect specialized information and experiences linked to housing project performance in Karachi's unique geographic and industrial environment. This will be done by focusing on this demographic and thus enabling a more thorough and pertinent analysis (Kwofie et al., 2014).

According to their competence, relevance, or familiarity with the research subject, researchers purposefully choose particular individuals or groups to be included in a study using the non-random selection approach (Etikan et al., 2016). Purposive sampling has been employed in this study on CSFs in housing projects in Karachi because it enables the selection of project management teams in construction firms with specialized knowledge and expertise in the construction sector. These participants are beneficial sources since they have firsthand experience with Karachi's housing developments, which aligns with the research's particular goals of gathering context-relevant and knowledgeable perspectives (Rai & Thapa, 2015).

Table 1
shows the demographic profile of the respondents.
Demographic Profile (n = 204)

		Frequency	Percent
Gender	Male	94	46.1
	Female	110	53.9
Age	18-24 years	42	20.6
	25-31 years	47	23
	32-38 years	43	21.1
	39-45 years	44	21.6
	Above 45 years	28	13.7
Education	Undergraduate	74	36.3
	Graduate	79	38.7
	Postgraduate	51	25
Years of Experience	1 to 5	55	27
	5 to 10	42	20.6
	10 to 15	47	23
	More than 15	60	29.4
Designation	Project Officer	43	21.1
	Project Manager	32	15.7
	Sr. Project Manager	27	13.2
	Project Coordinator	44	21.6
	Project Controller	24	11.8
	Project Officer	34	16.7
The scale of Housing Projects	Small	58	28.4
	Medium	75	36.8
	Large	71	34.8

The table provides a snapshot of the demographic composition of 204 individuals. Regarding gender, there were 94 males, accounting for 46.1% of the total, while females constituted the majority, with 110 participants making up 53.9% of the sample. Regarding age distribution, the largest group consisted of individuals aged between 25 and 31, comprising 47 respondents (23%). The second-largest age group was 32 to 38, encompassing 43 participants (21.1%). Participants aged 39 to 45 represented 44 individuals (21.6%), followed by those above 45 with 28 respondents (13.7%). Regarding educational attainment, most participants were either graduates (79 individuals, 38.7%) or undergraduates (74 individuals, 36.3%). Postgraduates, with 51 participants (25%), constituted a slightly smaller portion. Examining years of experience, the largest group fell within the 10 to 15 years bracket, comprising 47 individuals (23%). The next significant category was those with more than 15

years of experience, accounting for 60 respondents (29.4%). Participants with 1 to 5 years of experience constituted 55 individuals (27%), while those with 5 to 10 years of experience numbered 42 (20.6%). Regarding designation, Project Coordinators and Project Officers were the most common roles, each with 44 and 43 individuals (21.6% and 21.1%, respectively). Senior Project Managers and Project Managers constituted 27 and 32 participants (13.2% and 15.7%, respectively), while Project Controllers were the least numerous, with 24 individuals (11.8%). When considering the scale of housing projects, medium-sized projects were the most prevalent, with 75 respondents (36.8%). Large-scale projects were the next most common, accounting for 71 participants (34.8%), followed by small-scale projects with 58 individuals (28.4%).

3.3 Measures

Project management-related factors

The term "project management-related factors" refers to the essential components and variables that affect the effective planning, execution, and completion of a project, including scope, time, cost, quality, resources, and risk (Bilir, 2022). The study has adapted seven measures from Gashaw (2021) based on a five-point Likert scale and an alpha coefficient (or reliability) of 0.854.

3.4 Procurement-related factors

Procurement-related factors influence product or service acquisition, such as supplier selection, cost analysis, quality assurance, and regulatory compliance, which impact an organization's procurement process and outcomes (Rejeb et al., 2023). The study has adapted three measures from Gashaw (2021) based on a five-point Likert scale. And an alpha coefficient (or reliability) of 0.869.

3.5 Client-related factors

The particular traits, requirements, and situations of people or other entities who use a company's services or goods are referred to as client-related factors. They impact customer interactions and satisfaction (Chrityakierne, 2022). The study has modified few measures unit from Gashaw (2021) using a five-point Likert scale. And the alpha coefficient (or reliability) of 0.714.

3.6 Design-related factors

Design-associated factors relate to the manufacture of objects, spaces, or image a multitude of ways. Such elements encompass both factors of aesthetics, usability, functionality and unit design. Which helps to reach the set objectives, while being respondent to consumer

tastes and requirements demands (Zhou et al., 2023). The study has adapted five measures from Naseer et al. (2022) based on a five-point Likert scale. And the alpha coefficient (or reliability) of 0.665.

3.7 Contractor-related factors

Expertise, dependability, resources, and adherence to contractual requirements are only a few examples of the external factors known as "contractor-related factors." They affect the performance and results of a project that has been contracted (Breesam & Rajab, 2023). The study has adapted six measures from Gashaw (2021) based on a five-point Likert scale. And an alpha coefficient (or reliability) of 0.791.

3.8 Project manager-related factors

Project manager-related factors involve the person in charge of a project's planning, execution, and supervision. These may make or break its outcome (YOHANNES, 2022). The study has adapted four measures from Gashaw (2021) based on a five-point Likert scale. As well as an alpha coefficient (or reliability) of 0.853.

3.9 Business/work environment-related factors

"business/work environment-related factors" refers to the outside circumstances and components that influence an organization's operations. These may or may not include the physical workplace, culture, technology, rules, and economic climate, which affect employee productivity and performance (Elte et al., 2023). The study has adapted seven measures from Gashaw (2021) based on a five-point Likert scale. And an alpha coefficient (or reliability) of 0.897.

3.9.1 Project success

The completion of predetermined goals within the constraints of time, money, quality, and stakeholder satisfaction is referred to as project success. It ensures the project achieves its intended aims and satisfies organizational objectives (Shenhar et al., 2023). The study has adapted six measures from Javani et al. (2022) based on a five-point Likert scale and an alpha coefficient (or reliability) of 0.62.

3.9.2 Data collection

Data was collected through questionnaires or interviews of the sample using the survey approach. The survey method was effective and scalable, which made it particularly valuable for the present research. The surveys offer construction firms an opportunity to

collect information from a large sample of project management teams in a reasonable and time-saving way. This facilitates the examination at the required level of complexity in regard to diverse housing issues e.g. community well-being (Law et al., 2009). Through this method, researchers determine whether the experimental factors associated with conditioned stimuli (CSFs) led to the mathematical assessment of participants' impressions and attitudes. Therefore, such experiment could make statistics results much more usable (Morgan & Harmon, 2001).

4. Data Analysis

PLS-SEM model is a statistical way that assesses the links among all variables in the model's structure. It is also exceptionally applicable to research situations where the primary aim is to make predictions and explain complex interactions among variables(Memon et al., 2021). Also, PLS-SEM is suitable for the application of both the formative (indicators determine the construct) and the reflecting (latent constructs are evaluated by various indicators) measurement models. As well, it is useful in studies which are concerned with assembling complex relationships or frameworks. The PLS-SEM mainly answers the question about the relationships between the hidden constructs and observable variables (Hair Jr et al., 2017).

The study used f PLS-SEM for several reasons, to probe the critical success factors in housing development of Karachi. First of all, PLS-SEM is quite flexible and can deal with the more complicated, multi-dimensional constructions. Consistently with multilateral aspects of the CSFs, building projects usually elaborate (Hair et al., 2011b). Second, it is appropriate for exploratory studies that aim to comprehend the connections and interactions between variables. The research uses PLS-SEM as a valuable technique to find and examine the intricate relationships between CSFs (Hair et al., 2011b; Hair Jr et al., 2017).

5. Results and Discussions

5.1 Measurement model

The evaluation of the measurement model's construct and convergent validity using estimates from the PLS method is shown in Table 2.

Table 2
Measurement Model

	Loadings	Prob.	VIF	CR	AVE
BWF3 <- BWRF	0.717	0.000	1.665		
BWF4 <- BWRF	0.812	0.000	1.823	0.875	0.637
BWF5 <- BWRF	0.792	0.000	1.898		
BWF6 <- BWRF	0.863	0.000	2.134		
CLRF1 <- CLRF	0.876	0.000	1.475	0.879	0.783
CLRF2 <- CLRF	0.894	0.000	1.475		
CRF4 <- CRF	0.651	0.000	1.067	0.757	0.615
CRF5 <- CRF	0.898	0.000	1.067		
DRF1 <- DRF	0.813	0.000	1.556		
DRF2 <- DRF	0.830	0.000	2.909		
DRF3 <- DRF	0.648	0.000	1.727	0.886	0.611
DRF4 <- DRF	0.788	0.000	2.375		
DRF5 <- DRF	0.814	0.000	3.366		
PMAF3 <- PMRF	0.785	0.000	2.127		
PMAF4 <- PMRF	0.822	0.000	2.138		
PMAF5 <- PMRF	0.764	0.000	2.236	0.892	0.623
PMAF6 <- PMRF	0.729	0.000	1.860		
PMAF7 <- PMRF	0.841	0.000	2.311		
PMF1 <- PMGRF	0.953	0.019	1.465		
PMF2 <- PMGRF	0.554	0.097	1.201	0.794	0.574
PMF4 <- PMGRF	0.711	0.023	1.437		
PRF1 <- PRF	0.798	0.000	1.416		
PRF2 <- PRF	0.818	0.000	1.808	0.871	0.693
PRF3 <- PRF	0.880	0.000	1.876		
PS1 <- PS	0.806	0.000	1.336		
PS3 <- PS	0.697	0.000	1.237	0.796	0.567
PS5 <- PS	0.751	0.000	1.177		

Hair et al. (2011a) recommended that all the values of outer loadings must be higher than 0.70 for acceptance. Hair et al. (2014) also recommended a threshold for CR that values should be higher than 0.70; for AVE, it should be higher than 0.50. In addition, all the latent constructs have an alpha coefficient higher than 0.70. The above table shows that indicators and constructs have met these criteria, and, therefore, construct validity and convergent validity have been achieved.

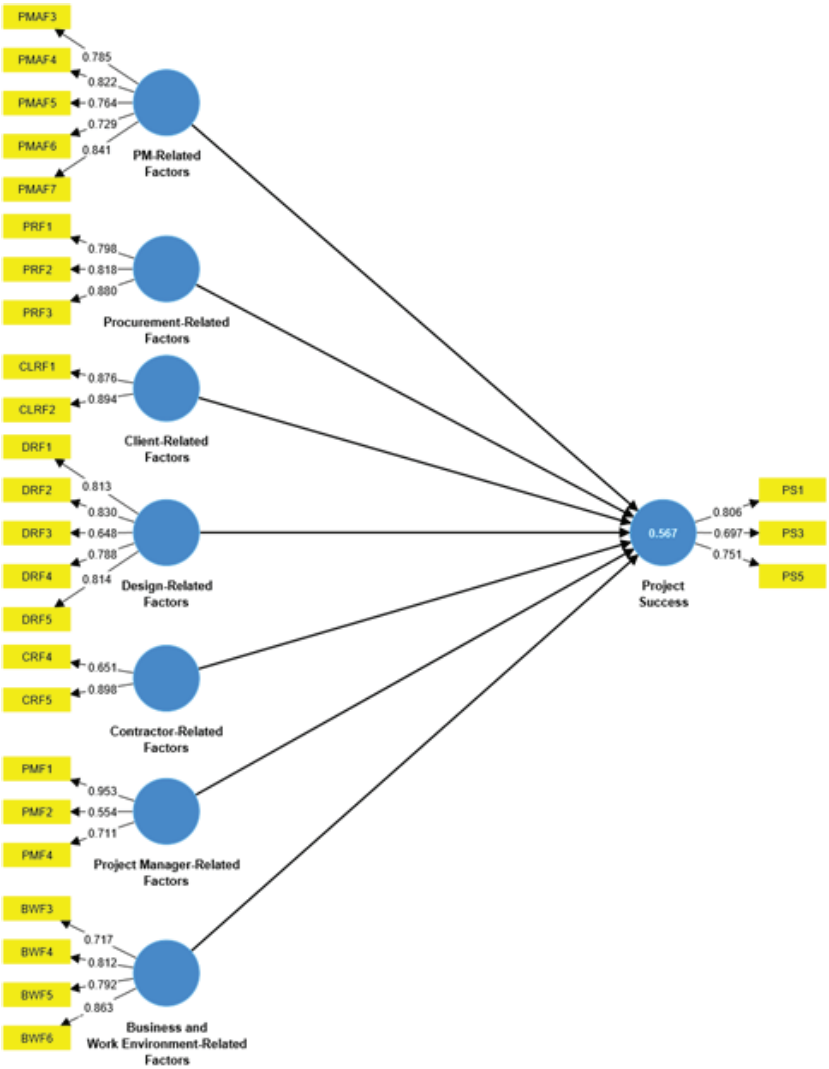

Figure 2: PLS Algorithm

5.2 Discriminant validity

The result of the HTMT ratio for the PLS algorithm's assessment of discriminant validity is shown in Table 3 below.

Table 3
HTMT Ratio

	BWRF	CLRF	CRF	DRF	PMGRF	PMRF	PRF	PS
BWRF								
CLRF	0.552							
CRF	0.397	0.319						
DRF	0.196	0.333	0.315					
PMGRF	0.131	0.276	0.089	0.184				
PMRF	0.549	0.629	0.379	0.196	0.113			
PRF	0.228	0.640	0.273	0.174	0.133	0.422		
PS	0.686	0.698	0.627	0.255	0.153	0.710	0.647	

Table 4 shows the result of the HTMT ratio for discriminant validity, and therein, Henseler et al. (2016); Henseler et al. (2015) suggested that the HTMT ratio should not be higher than 0.85 for acceptable divergence between latent constructs. Therefore, it has been manifested that the highest HTMT ratio of 0.647 is between PS and PRF.

5.3 Structural model

The outcomes of the hypothesis testing using PLS path modeling analysis are displayed in Table 4

Table 4
Hypothesis Testing using PLS Path Modeling Analysis

	Estimate	t-Stats	Prob.	VIF	f^2
Business/Work Environment-Related Factors	0.192	3.124	0.002	1.472	0.058
Client-Related Factors	0.149	2.288	0.022	1.747	0.029
Contractor-Related Factors	0.222	4.063	0.000	1.090	0.104
Design-Related Factors	0.281	5.021	0.000	1.125	0.162
Project Manager-Related Factors	0.037	0.546	0.585	1.046	0.003
Project Management-Related Factors	0.224	4.290	0.000	1.540	0.075
Procurement-Related Factors	0.304	3.777	0.000	1.362	0.157

Dependent Variable: Project Success; R-Square = 0.567; Q-Square = 0.519

The above table has shown that business/work environment-related factors (ß = 0.192, $p < 0.05$) positively affect project success. Client-related factors (ß = 0.149, $p < 0.05$) positively and significantly affect project success. Contractor-related factors (ß = 0.222, $p < 0.05$) positively affect project success. Design-related factors (ß = 0.281, $p < 0.05$) positively affect project success. Project manager-related factors (ß = 0.037, $p > 0.05$) have a positive

and insignificant effect on project success. Project management-related factors (ß = 0.224, p < 0.05) positively affect project success. Procurement-related factors (ß = 0.304, p <0.05) positively and significantly affect project success.

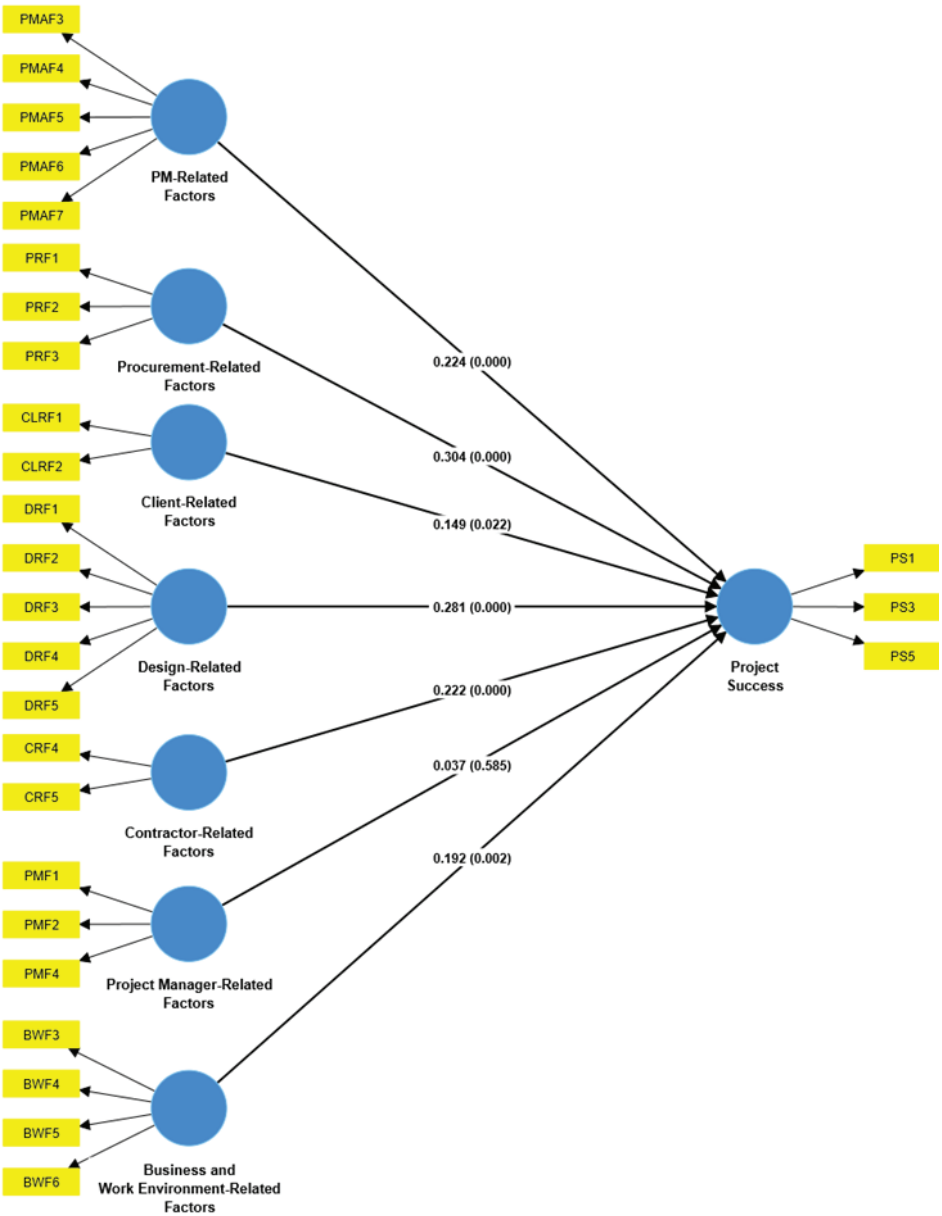

Figure 3: PLS Bootstrapping

6. Discussions

The study results have shown that business/work environment-related factors positively affect project success. The results are similar to the study of Lee et al. (2023). Due to their direct influence on resource availability, team cooperation, and overall operational efficiency, business/work environment-related aspects substantially positively affect the project's success. A positive work atmosphere encourages open communication, reduces disturbances, and supports an accountability culture. Additionally, it promotes employee motivation and fulfilment, which raises production levels. Furthermore, a well-run and encouraging work atmosphere promotes prompt decision-making and efficient problem-solving, eventually aiding in completing projects (Abdulkadir, 2023).

Also, client-related factors have a positive and significant effect on project success. The results are in line with the conclusions made by Risso (2022). The justification for this is that a supportive and involved customer aligns with expectations, improves project clarity, and reduces ambiguities. The possibility of scope creep is decreased through clear client communication, which produces well-defined project scopes and objectives. An actively participating customer also offers quick feedback, which speeds up issue-solving and decision-making. The practical completion of projects within allotted deadlines and financial constraints is the end consequence of this active relationship, which creates trust and satisfaction, inspires teams to go above and beyond, and ultimately pays off (Salman & Auso, 2022).

It has also been revealed that contractor-related factors have a positively significant effect on project success. The results are similar to the study of Gao (2022). Contractor-related characteristics benefit project success since their knowledge, effectiveness, and dependability directly affect how the project is carried out. Professional contractors contribute technical expertise and sector knowledge to ensure quality work. They avoid delays and expense overruns by sticking to budgets and deadlines. Effective contractor communication promotes cooperation and addresses concerns swiftly. A reliable contractor builds stakeholder trust and project progress. This skill and reliability streamline initiatives, resulting in good results (Farouk et al., 2023).

Moreover, design-related factors have a positively significant effect on project success. The results align with the conclusions made by Thompson et al. (2022). Design-related features help a project succeed by establishing its usefulness, aesthetic appeal, and financial viability. A well-planned design eliminates construction errors and changes, saving time and money. It ensures the project meets client needs. A good design maximizes materials and space for cost savings. A careful design reduces risks by considering safety and legality. Project success depends on thorough planning and attention to detail (Issa et al., 2023).

Similarly, the study results concluded that project manager-related factors have a positive but insignificant effect on project success. The results are similar to the study of Plattfaut (2022). Project manager-related variables may not affect project success if the manager lacks leadership or expertise. In such cases, their actions may not affect project success. Other decisive project environment factors may overshadow the project manager's efforts. Ineffective communication or resource management by the project manager may restrict their benefits. Project managers are crucial. However, their impact on success depends on their skills and the project (Bahamid et al., 2022).

The research has also shown that project management-related factors have a positively significant effect on project success. The results align with the conclusions made by Bilir (2022). The success of a project is positively and significantly influenced by characteristics linked to project management. Project management is essential in planning, organizing, and managing project operations. Having well-defined goals, allocating resources appropriately, and employing risk mitigation strategies are all components of efficient project management. It streamlines the process by setting deadlines, tracking progress, and encouraging quick decisions. A successful project manager will increase work, decrease conflict, and foster stakeholder engagement, teamwork, and communication. Project success depends on their capacity to respond to unanticipated events and connect their roles with the organization's goals (Zaman et al., 2023).

Lastly, procurement-related factors positively and significantly affect project success, in agreement with Naseer et al. (2022). Procurement-related elements positively impact project success because they affect resource and service acquisition. Effective procurement practices ensure timely, high-quality goods and services and prevent delays. Cost-effective procurement tactics improve resource efficiency and budget adherence. Efficient procurement management reduces supplier performance and contract compliance issues. Careful vendor selection and bright negotiating lead to reasonable terms. Timely and cost-effective procurement improves project completion (Nanto, 2022; Rejeb & Appolloni, 2022).

6.1 Conclusion and Recommendations

This study examines CSFs in Karachi housing projects to improve our understanding of project success determinants in Pakistan's construction sector. Researchers carefully selected samples for their investigation. This Karachi housing project CSF study used a survey method due to its efficacy and scalability. The PLS-SEM method will bridge the literature gap and provide a complete picture of Pakistani housing project performance. This strategy adds a quantitative and integrative perspective. The results have shown that business/work environment-related factors, client-related factors, contractor-related factors, design-related factors, project management-related factors, and procurement-related factors

positively affect project success. In contrast, project manager-related factors have a positive but statistically insignificant effect on project success.

This study's concentration on Pakistan's construction industry makes it an essential project management subfield. Contractors, managers, and politicians must understand the CSFs that affect project success in this sector. This data's potential for risk management, resource allocation, and strategic decision-making can improve project execution. The ever-changing construction industry makes it vital to explore CSFs in depth; doing so may assist in building standards and principles that support worker innovation and excellence.

6.2 Recommendations

The construction industry should prioritize project management efficiency. CSFs for project management are crucial. Companies should recruit resource allocation, coordination, and arrangement-trained project managers to attain this goal. Communication channels the project management team sets up determine whether a project is completed on time and under budget. In markets with supply chain interruptions and material price variations, procurement issues affect project performance disproportionately. Construction enterprises should carefully monitor their procurement procedures, employ successful and cost-effective methods, and create long-term collaborations with reliable suppliers. Flexibility during procurement and monitoring material prices can boost project success and reduce risk.

A project's client-centric phases emphasize client participation and enjoyment. Construction organizations should prioritize client feedback, inquiries, and issues by responding quickly. Positive client-contractor relationships may result in repeat business and referrals, which ultimately helps the firm's reputation and growth. Practically, they may help finish jobs. Design requires contemporary, functional, and technical methods, not aesthetic ones. Businesses should prioritize sustainable, disaster-proof, and functional designs. These characteristics help projects flourish and promote resilient and sustainable building. Contractor issues emphasize the importance of choosing licensed contractors and following safety measures. Firms should evaluate contractors thoroughly to prioritize skilled personnel and select trustworthy companions to avoid project delays and ensure safety. Project managers demonstrate the need for good project leadership. The most crucial aspect of project success is providing project managers with the skills to make decisions, solve problems, and understand local regulations.

From a policymaker perspective, the insights derived from this research can inform policy decisions. These aim to enhance the construction fields' regulatory framework and enterprise requirements. Comprehending CSFs promotes greater mission accomplishment, policymakers can now broaden the scope of targeted interventions and activities that encourage positive behavioral changes. It might demand imposing rules that provide rewards

and punishment for CSFs adherence. Consequently, the initiative will also create a top-of-the-class and innovation culture and structures to share knowledge as well as to diffuse best practices among the industry stakeholders. Lastly, construction companies need to adopt a flexible and responsive approach in dealing with variables such as the ever-changing business environment as well as the workplace. This incorporates shifting the plans in line with some of the challenges such as market trends, legislative changes and economic situations. Construction companies working in residential projects in Pakistan can have a more positive outcome of the projects and help the ongoing development of the construction industry in the area through the implementation of this management advice.

6.3 Limitations and future research

This study on the critical success factors (CSFs) in Karachi housing complexes may have some limitations. One possible drawback of this research on the CSFs of Karachi´s residential complexes could be that, with purposive sampling, findings may be distorted. This could complicate achieving universal acceptance of results outside of a particular project management team. On the other hand, the participants might choose to give socially appropriate survey answers that do not exactly represent the actual procedures. Additionally, longitudinal designs, that follow CSFs' changes over time, would be great study advancement in the field. An improvement from its use of a smaller sample, by including areas from rural and urban cities, would improve the contextualization of the study. One strategy that may be used to make an honest comparison with Pakistan to other countries could also offer useful lessons about the construction sector which is its problem and maybe its opportunities.

References

Abdulaali, A., Alnoor, A., Al-Abrrow, H., Abdullah, H., & Abbas, S. (2022). The influence of financial critical success factors on project success: Evidence from several electric power projects in Iraq. Proceedings of 2nd International Multi-Disciplinary Conference Theme: Integrated Sciences and Technologies, IMDC-IST 2021, 7-9 September 2021, Sakarya, Turkey. DOI: 10.4108/eai.7-9-2021.2314877

Abdulkadir, M. (2023). Project Management Schedule Planning for a Short-distance Factory Relocation: A case study. URL: https://urn.fi/URN:NBN:fi-fe2023053050389.

Ahmad, S., Aftab, F., Eltayeb, T., & Siddiqui, K. (2023). Identifying critical success factors for construction projects in Saudi Arabia. E3S Web of Conferences. DOI: 10.1051/e3sconf/202337102047

Ahmad, U., Sami, B., & Khan, A. A. (2022). Risk Identification and Assessment in Sustainable Housing Project: A Case of Housing Sector in Pakistan. *Journal of Accounting and Finance in Emerging Economies, 8*(2), 275-286. DOI: 10.26710/jafee. v8i2.2288

Akhtar, N., Habib, R. I., & Madni, A. (2022). Naya Pakistan housing program: An analytical study of mortgage-backed security model and legal framework for low-cost accessible housing scheme in Pakistan. In *Accessible Housing for South Asia: Needs, Implementation and Impacts* (pp. 259-270). Springer. DOI: 10.1007/978-3-030-88881-7_14

Ali, A. H., Elyamany, A., Ibrahim, A. H., Kineber, A. F., & Daoud, A. O. (2023). Modelling the relationship between modular construction adoption and critical success factors for residential projects in developing countries. *International Journal of Construction Management*, 1-12. DOI: 10.1080/15623599.2023.2185940

Arora, R. (2022). Project Management. Washington: Amazon Publisher.

Artpairin, A., & Pinmanee, S. (2023). Critical success factors in the management of petrochemical construction projects for contractors and subcontractors during the COVID-19 pandemic. *International Journal of Construction Management, 23*(11), 1956-1968. DOI: 10.1080/15623599.2022.2029678

Bahamid, R. A., Doh, S. I., Khoiry, M. A., Kassem, M. A., & Al-Sharafi, M. A. (2022). The Current Risk Management Practices and Knowledge in the Construction Industry. *Buildings, 12*(7), 1016. DOI: 10.3390/buildings12071016

Barreiro, P. L., & Albandoz, J. P. (2001). Population and sample. Sampling techniques. *Management mathematics for European schools, 1*(1), 1-18. URL: http://www.mathematik.unikl.de/mamaeusch.

Bilir, C. (2022). Project success criteria, critical success factors (CSF), and agile projects. *Contemporary challenges for Agile project management*, 52-72. DOI: 10.4018/978-1-7998-7872-8.ch004

Breesam, H. K., & Rajab, H. A. M. (2023). The Role of Project Health Check Reports in Identifying Indicative Factors of a Troubled Project. *Journal of Engineering, 29*(08), 61-75. DOI: 10.31026/j.eng.2023.08.05

Buchanan, G. M., Seligman, M. E., & Seligman, M. (2013). Explanatory style. Routledge.

Chang, S.-C., & Wongwatkit, C. (2023). Effects of a peer assessment-based scrum project learning system on computer programming's learning motivation, collaboration, communication, critical thinking, and cognitive load. *Education and Information Technologies*, 1-24. DOI: 10.1007/978-3-031-60227-6_11

Chrityakierne, K. (2022). Properties of Key Audit Matters: Determinants and Impacts on the Capital Market. URL: https://hdl.handle.net/2123/29913.

Ciric Lalic, D., Lalic, B., Delić, M., Gracanin, D., & Stefanovic, D. (2022). How project management approach impact project success? From traditional to agile. *International Journal of Managing Projects in Business, 15*(3), 494-521. DOI: 10.1108/IJMPB-04-2021-0108.

Dmytriyev, S. D., Freeman, R. E., & Hörisch, J. (2021). The relationship between stakeholder theory and corporate social responsibility: Differences, similarities, and implications for social issues in management. *Journal of Management Studies, 58*(6), 1441-1470. DOI: 10.1111/joms.12684

Elkhatib, M., Al Hosani, A., Al Hosani, I., & Albuflasa, K. (2022). Agile Project Management and Project Risks Improvements: Pros and Cons. *Modern Economy, 13*(9), 1157-1176. DOI: 10.4236/me.2022.139061

Elte, Y., Acton, K., Martin, J., Nielen, M., van Weeren, R., & Wolframm, I. (2023). Engage and enjoy–investigating predictors of employee engagement and work satisfaction in equine veterinary professionals. Frontiers in Veterinary Science, 10, 1036388. DOI: 10.3389/fvets.2023.1036388

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics, 5*(1), 1-4. DOI: 10.11648/j.ajtas.20160501.11

Farouk, A. M., Zulhisham, A. Z., Lee, Y. S., Rajabi, M. S., & Rahman, R. A. (2023). Factors, challenges and strategies of trust in BIM-Based construction projects: A case study in Malaysia. *Infrastructures, 8*(1), 13. DOI: 10.3390/infrastructures8010013

Freeman, R. (1984). Strategic Management: A Stakeholder Approach Pitman Publishing Inc. Marshfield, MA.

Freeman, R. E., Phillips, R., & Sisodia, R. (2020). Tensions in stakeholder theory. *Business & Society, 59*(2), 213-231. DOI: 10.1177/0007650318773750

Gao, J. (2022). Analysis of enterprise financial accounting information management from the perspective of big data. *International Journal of Science and Research (IJSR), 11*(5), 1272-1276.DOI: 10.21275/SR22514203358

Gashaw, S. (2021). Critical success factors for projects financed by development bank of ethiopia st. mary's university. URL: http://hdl.handle.net/123456789/6404.

Goel, V. (2007). Anatomy of deductive reasoning. *Trends in cognitive sciences, 11*(10), 435-441. DOI: 10.1016/j.tics.2007.09.003

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed, a silver bullet. *Journal of Marketing theory and Practice, 19*(2), 139-152. DOI: 10.2753/MTP1069-6679190202

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *European Business Review, 26*(2), 106-121. DOI: 10.1108/EBR-10-2013-0128

Hair Jr, J. F., Matthews, L. M., Matthews, R. L., & Sarstedt, M. (2017). PLS-SEM or CB-SEM: updated guidelines on which method to use. *International Journal of Multivariate Data Analysis, 1*(2), 107-123. DOI: 10.1504/IJMDA.2017.087624

Haris, M., & Yang, Q. (2023). Investigating the Moderating Role of Political Factors on Internal Success Factors and Project Success: Empirical Evidence from Pakistan. *Sustainability, 15*(11), 8910. DOI: 10.3390/su15118910

Hashmi, S. D., Shahzad, K., & Izhar, M. (2022). Proposing total quality management as a buffer between global software development challenges and project success. *The TQM Journal, 34*(5), 1432-1447. DOI: 10.1108/TQM-08-2020-0192

Hasmori, M. F., Memon, M. H., & Ismail, R. (2023). Critical Factors and Mitigating Measures of Construction Delays of Pakistani Building Construction Projects. *International Journal of Sustainable Construction Engineering and Technology, 14*(2), 240-249. URL: https://penerbit.uthm.edu.my/ojs/index.php/IJSCET/article/view/13984.

Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Industrial management & data systems, 116*(1), 2-20. DOI: 10.1108/IMDS-09-2015-0382

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the academy of marketing science, 43*(1), 115-135. DOI: 10.1007/s11747-014-0403-8

Hotha, K. K. (2023). Unleashing the Power of Innovation in CDMOs through Customer-Centricity and Culture of Service. *American Journal of Industrial and Business Management, 13*(4), 234-246. DOI: 10.4236/ajibm.2023.134016

Hussain, A., Ahmed, A., & Hussain, W. (2022). Increasing Housing Demand in Pakistan. In Accessible Housing for South Asia: Needs, *Implementation and Impacts* (pp. 103-125). Springer. DOI: https://doi.org/10.1007/978-3-030-88881-7_6

Iqbal, M., Ma, J., Ahmad, N., Ullah, Z., & Hassan, A. (2023). Energy-Efficient supply chains in construction industry: An analysis of critical success factors using ISM-MICMAC approach. *International Journal of Green Energy, 20*(3), 265-283. DOI: 10.1080/15435075.2022.2038609

Ismail, H. B. B., Sarbini, N. N. B., Ariffin, H. L. B. T., Ibrahim, I. S. B., & Rahman, M. F. B. A. (2022). Causal Factors of Accident Related to Design Aspect in Construction Industry. *In Sustainability Management Strategies and Impact in Developing Countries* (pp. 149-164). Emerald Publishing Limited. DOI: 10.1108/S2040-726220220000026012

Issa, H., Liana, Y., & Mazana, M. Y. (2023). Designing a Project Governance Framework for ICT Project Implementation in Public Sectors in Tanzania. *European Journal of Theoretical and Applied Sciences, 1*(4), 836-850. DOI: 10.59324/ejtas.2023.1(4).77

Jang, Y., Lee, J.-M., & Son, J. (2022). Development and application of an integrated management system for off-site construction projects. *Buildings, 12*(7), 1063. DOI: 10.3390/buildings12071063

Javani, B., Mamena, H., & Dewa, M. (2022). Effective risk management practice and project success: the case of a water utility's construction projects. 33rd Annual Southern African Institute of Industrial Engineering Conference. URL: https://hdl.handle.net/10321/4490.

Kesmodel, U. S. (2018). Cross-sectional studies–what are they good for? *Acta obstetricia et gynecologica Scandinavica, 97*(4), 388-393. DOI: 10.1111/aogs.13331

Khan, M. K., Abdul Rasid, S. Z., Bardai, B., & Saruchi, S. A. (2023a). Framework of affordable cooperative housing through an innovative waqf-based source of finance in Karachi. *Journal of Islamic Accounting and Business Research, 14*(3), 379-397. DOI: 10.1108/JIABR-05-2021-0140

Khan, S. U., Khan, A. W., Khan, F., Khan, J., & Lee, Y. (2023b). Factors influencing vendor organizations in the selection of DevOps for global software development: an exploratory study using a systematic literature review. Cognition, *Technology & Work*, 1-16. DOI: 10.1007/s10111-023-00733-7

Kumar, V., Singh, R., & Pandey, A. (2024). Multiple stakeholders' critical success factors scale for success on large construction projects. *Asian Journal of Civil Engineering, 25*(2), 1691-1705. DOI: 10.1007/s42107-023-00871-3

Kwofie, T. E., Fugar, F., Adinyira, E., & Ahadzie, D. (2014). A conceptual framework for evaluating communication performance among mass housing project team. Procs. 3rd International Conference on Infrastructure Development in Africa.

Law, E. L.-C., Roto, V., Hassenzahl, M., Vermeeren, A. P., & Kort, J. (2009). Understanding, scoping and defining user experience: a survey approach. Proceedings of the SIGCHI conference on human factors in computing systems. DOI: 10.1145/1518701.1518813

Lee, K.-T., Ahn, H., & Kim, J.-H. (2023). Project Coordinators' Perceptions according to the Organization Structure to Reduce Communication Risks in Multinational Project. KSCE *Journal of Civil Engineering, 27*(3), 915-929. DOI: 10.1007/s12205-023-0862-x

Li, F., Laili, Y., Chen, X., Lou, Y., Wang, C., Yang, H., Gao, X., & Han, H. (2023). Towards big data driven construction industry. *Journal of Industrial Information Integration*, 100483. DOI: 10.1016/j.jii.2023.100483

Malik, S. (2023). Beneficiary Expectation from Low-Income Housing Projects: A Post-Occupancy Evaluation Study from Punjab, Pakistan. *Annals of Human and Social Sciences, 4*(2), 599-614. DOI: 10.35484/ahss.2023(4-II)55

Mashali, A., Elbeltagi, E., Motawa, I., & Elshikh, M. (2023). Stakeholder management challenges in mega construction projects: critical success factors. *Journal of Engineering, Design and Technology, 21*(2), 358-375. DOI: 10.1108/JEDT-09-2021-0483

Memon, M. A., Ramayah, T., Cheah, J.-H., Ting, H., Chuah, F., & Cham, T. H. (2021). PLS SEM statistical programs: a review. *Journal of Applied Structural Equation Modeling, 5*(1), 1-14. DOI: 10.47263/JASEM.50-6

Morgan, G. A., & Harmon, R. J. (2001). Data collection techniques. Journal-American Academy of Child and Adolescent Psychiatry, 40(8), 973-976. https://www.researchgate.net/profile/George-Morgan-4/publication/11842651_Data_Collection_Techniques/links/5b8813234585151fd13c8cdd/Data-Collection-Techniques.pdf.

Muhammad, S., Alasan, I. I., & Afridi, F. K. (2022). Impact of Success Factors on Project Success: Empirical Evidence from Khyber Pakhtunkhwa. *International Journal of Special Education, 37*(3).

Nanto, S. G. (2022). Integration, challenges, and risk management processes of contractors in Renewable Energy Projects University of Johannesburg. URL: https://hdl.handle.net/10210/502627.

Naseer, S., Abbass, K., Asif, M., Hashmi, H. B. A., Naseer, S., & Achim, M. V. (2022). Impact of Critical Success Factors on Project Success Through the Mediation of Knowledge Creation. *Frontiers in Psychology, 13*, 892488. DOI: 10.3389/fpsyg.2022.892488

Navaratnam, S., Satheeskumar, A., Zhang, G., Nguyen, K., Venkatesan, S., & Poologanathan, K. (2022). The challenges confronting the growth of sustainable prefabricated building construction in Australia: Construction industry views. *Journal of Building Engineering, 48*, 103935. DOI: 10.1016/j.jobe.2021.103935

Nawaz, A., & Tian, R. (2022). The impact of authentic leadership on project success: the mediating effect of organizational learning and innovation. *International Journal of Managing Projects in Business, 15*(6), 960-982. DOI: 10.1108/IJMPB-12-2021-0329

Omolloh, J., Were, S., & Muchelule, Y. (2023). Timemanagement and performance of county referral hospitals in kenya; the moderating role of stakeholder participation. *International Journal of Management and Business Research, 5*(1), 444-457.

Omotayo, T. S., Danvers-Watson, O., & Oyegoke, A. S. (2022). Subcontractor trust issues on payment and valuation practices in UK private projects. *Journal of Financial Management of Property and Construction, 28*(1), 64-90. DOI: 10.1108/JFMPC-07-2021-0048

Oni, O. Z., Olanrewaju, A., & Khor, S. C. (2023). Review of critical success factors affecting Malaysia's construction industry's sustainable health and safety practices. *Frontiers in Engineering and Built Environment, 3*(1), 48-62. DOI: 10.1108/FEBE-05-2022-0019

Phillips, R., Freeman, R. E., & Wicks, A. C. (2003). What stakeholder theory is not. *Business ethics quarterly, 13*(4), 479-502. DOI: 10.5840/beq200313434

Plattfaut, R. (2022). On the Importance of Project Management Capabilities for Sustainable Business Process Management. *Sustainability, 14*(13), 7612. DOI: 10.3390/su14137612

Rafeh, A., Qureshi, M. U., Hameed, A., & Rasool, A. M. (2023). Ranking and grouping of critical success factors for stakeholder management in construction projects. *Journal of Asian Architecture and Building Engineering*, 1-14. DOI: 10.1080/13467581.2023.2193609

Rai, N., & Thapa, B. (2015). A study on purposive sampling method in research. Kathmandu: Kathmandu School of Law, 5.

Rankinen, J.-A., Lakkala, S., Haapasalo, H., & Hirvonen-Kantola, S. (2022). Stakeholder management in PED projects: challenges and management model. *International Journal of Sustainable Energy Planning and Management, 34*, 91-106. DOI: 10.54337/ijsepm.6979

Rejeb, A., & Appolloni, A. (2022). The nexus of Industry 4.0 and circular procurement: A systematic literature review and research agenda. *Sustainability, 14*(23), 15633. DOI: 10.3390/su142315633

Rejeb, A., Rejeb, K., Appolloni, A., Keogh, J. G., & Iranmanesh, M. (2023). Uncovering the Green Procurement Knowledge Structure: A Systematic Citation Network Analysis. *Circular Economy and Sustainability*, 1-30. DOI: 10.1007/s43615-023-00287-w

Risso, D. (2022). Integrating sustainability into an organization: a project, program, and portfolio management approach Politecnico di Torino. URI: http://webthesis.biblio.polito.it/id/eprint/25631.

Salman, D. A., & Auso, K. A. (2022). The Sequential Influence of Creative Leadership and Organizational Environment on Strategic Performance. *Journal of Environmental & Public Health*. DOI: 10.1155/2022/5948806

Samwel, K., Nyamiaka, M., Wamaitha, L., & Waichigo, S. (2023). Influence of Stakeholders' Management on Public Project Success: Evidence from Kenya. *International Journal of Entrepreneurship and Project Management, 8*(1), 35-43. DOI: 10.47604/ijepm.2059

Sayidganiev, Z. S. U., Karimbaev, B. B. U., & Achilov, O. R. (2022). Advantages and disadvantages of construction industries. *Academic research in educational sciences, 3*(Special Issue 2), 123-127.

Shamsudin, S., & Velmurugan, V. (2023). A study on the drivers of corporate culture impacting employee performance in IT industry. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev., 8*(2), 13.

Shenhar, A., Milosevic, D., & Dvir, D. (2023). Project planning unveiled: decoding its significance in shaping project success-a case of the skills development fund (sdf) in kigali, rwanda. Interdisciplinary *Journal of Linguistics, Marketing and Communication (IJLMC), 10*(3), 41-66. DOI: 10.5281/zenodo.8184120

Soltanzadeh, A., Mahdinia, M., Omidi Oskouei, A., Jafarinia, E., Zarei, E., & Sadeghi-Yarandi, M. (2022). Analyzing health, safety, and environmental risks of construction projects using the fuzzy analytic hierarchy process: A field study based on a project management body of knowledge. *Sustainability, 14*(24), 16555. DOI: 10.3390/su142416555

Somsopon, W., Kim, S. M., Nitivattananon, V., Kusakabe, K., & Nguyen, T. P. L. (2022). Issues and Needs of Elderly in Community Facilities and Services: A Case Study of Urban Housing Projects in Bangkok, Thailand. *Sustainability, 14*(14), 8388. DOI: 10.3390/su14148388

Thompson, M. P., O'Connor, C. D., Gannon, B. M., Caggiano, M. D., Dunn, C. J., Schultz, C. A., Calkin, D. E., Pietruszka, B., Greiner, S. M., & Stratton, R. (2022). Potential operational delineations: new horizons for proactive, risk-informed strategic land and fire management. *Fire Ecology, 18*(1), 1-20. DOI: 10.1186/s42408-022-00139-2

Watermeyer, R. (2022). 18. Procurement and delivery management. Research companion to construction economics, 371. DOI: 10.4337/9781839108235

Weinstein, E. R., Herrera, C. M., Pla Serrano, L., Martí Kring, E., & Harkness, A. (2023). Promoting health equity in HIV prevention and treatment research: a practical guide to establishing, implementing, and sustaining community advisory boards. Therapeutic advances in infectious disease, 10, 20499361231151508. DOI: 10.1177/20499361231151508

Wu, S.-W., Yan, Y., Pan, J., & Wu, K.-S. (2023). Linking Sustainable Project Management with Construction Project Success: Moderating Influence of Stakeholder Engagement. *Buildings, 13*(10), 2634. DOI: 10.3390/buildings13102634

Yohannes, H. (2022). Practice and impact of balanced scorecard on the performance of ethiopian agricutural businesses corporation (eabc) st. mary's university. URL: http://hdl.handle.net/123456789/7725.

Yu, D., & He, Z. (2022). Digital twin-driven intelligence disaster prevention and mitigation for infrastructure: Advances, challenges, and opportunities. *Natural hazards, 112*(1), 1-36. DOI: 10.1007/s11069-021-05190-x

Zaman, S., Wang, Z., Rasool, S. F., uz Zaman, Q., & Raza, H. (2022). Impact of critical success factors and supportive leadership on sustainable success of renewable energy projects: Empirical evidence from Pakistan. *Energy Policy, 162*, 112793. DOI: 10.1016/j.enpol.2022.112793

Zaman, U., Naeni, L. M., Huda, N. u., & Khwaja, M. G. (2023). Time Flies When You are Having Fun: The Mediating Effects of Project Opportunity Management in the Relationship Between Project Leaders' Self-Efficacy and Multidimensional Project Success. *Project Management Journal, 54*(2), 132-148. DOI: 10.1177/8756 9728221134524

Zanjirchi, S. M., & Moradi, M. (2012). Construction project success analysis from stakeholders' theory perspective. *African Journal of Business Management, 6*(15), 5218. DOI: 10.5897/AJBM11.2437

Zhou, X., Miyauchi, R., & Inoue, Y. (2023). Sustainable Fashion Product Innovation: Continuous Value of Apparel Products on Second-Hand Product Trading Platforms. *Sustainability, 15*(10), 7881. DOI: 10.3390/su15107881