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Analysis of Human Resource Factors Influencing the Delivery of Construction Projects in Shiraz

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Abstract

Construction delays are a chronic problem in Shiraz, marring schedules, pushing up costs and putting a strain on the regional economy. This report explores the drains on timeliness, focusing on two key players: employers and the workforce. Through 180 major housing projects across the city, the research reveals how poor scheduling, workforce mismanagement and employer decision-making more often stymie progress. filtered out through surveys and site visits the opinions of 60 project supervisors the variety of whom was supposed to accurately reflect the wider landscape and scrutinized their responses to figure out where errors occur.T he findings stung: 43% of the time, delays return to the workforce things like skill gaps or bad coordination and 37% of the time to employers things like delayed approval or budget mistakes. These are not just figures: They represent real-world frustrations for workers, developers and communities left in limbo for homes. By directly addressing these human-centered issues such as enhancing training, simplifying decisions or optimizing resource use the study claims Shiraz can unlock its construction bottlenecks.

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INTRODUCTION

It is a challenge that often delays them from completing large-scale projects on time. Such disruptions refer to any event or action that prevents tasks from being completed within their contracted times (Schumacher, 1995). Such potential setbacks result in wastage of national resources besides questioning the technical and financial viability of initiatives (Ahmadi, 2006). As such, these entities, including government bodies, technical experts, and urban planners are increasingly prioritizing timely execution, as meeting deadlines is a hallmark measure of project management effectiveness and a key metric used to evaluate project outcomes from both practical and analytical perspectives. Reasons for project delays are many and complex, inter-connected, interdependent. According to research, several issues have contributed, primarily up to contractual vagueness, contractors lack of sufficient funds, improper contractor/inadequate personnel, lack of owner's expertise in consultancy, disruption of the supply chain, difficulties in sourcing materials, and unpredictable weather (Schumacher, 1995). The generalization of extended project duration represents an additional worry in areas of the world such as the Middle East where developing countries like Iran remain to be a figurative depiction of this trend. Oversight from employers, contractors and consultants cannot shield them from operational inefficiencies that lead to budget overruns, extended schedules and even project suspensions. Such challenges serve as a reminder of the urgent need for focused approaches to improve efficiency and minimize delays.

Delays have more than just a time consequence, considerably impacting urban development and sustainability activity. Hold-ups in urban initiatives illuminate systemic barriers that hinder the delivery of must-have projects—inhibiting ambitions for urban fabric revitalization and growth (Eshtehardian, 2010). This "civil project crisis," as it is called, highlights the need for new approaches to clear inefficiencies. And constantly re-adjusting project schedules drives up costs, leaving many projects unaffordable when subjected to cost-benefit scrutiny. According to Ansari (2011), the construction projects have between 40 to 50 years of average lifespan where one-fourth of the functional life of the project might be compromised due to delays and this cycling process increases government expenditure as well as divert project life time. It's devastating to projects, economically and socially, not enough to have delays on their construction. Longer timelines generally raise the costs of borrowing as interest rates rise, increase labor costs and send material costs soaring in the midst of inflation, all of which tend to drive project costs well beyond original estimates. Socially, these delays thwart urban planning efforts further aggravating facets of urbanization involving overcrowding, poor living standards and inadequate infrastructure for communities. These cascading effects highlight the importance of proactive measures to minimize delays so that projects better reflect economic constraints and societal needs. In addition to the immediate consequences, delays hinder long-term national development aspirations. Longer delays in the execution of projects can hinder the process of industrial development at a country level, dissuading foreign investment and reducing the competitiveness of a country on a global scale (Kaming et al., 1997), which is especially concerning where infrastructure development is perceived as a key facilitator of economic growth, e.g., in Iran. The fallout also has a wider implications of eroding public trust in government institutions that overseers of these initiatives, and it is citizens that pay the penalty of customer service delays and lack of facilities. Contributing to the improvement of these broader implications hinges on a holistic approach through the link between policy reform, stakeholder collaboration, and technological progress.The environmental cost of delays is another crucial dimension of this question. Longer project durations contribute to longer-time resource utilization, higher amount of wastage generation, and more carbon emission, contradicting the global sustainability goals (Doloi et al., 2012). Idle machines and prolonged site activity, for example, have even greater potential to contribute to environmental degradation, while delayed urban projects can preclude timely delivery of solutions such as green infrastructure or public transit systems. Such delays combined with environmental impact speak to the need to expedite project execution

to be consistent with ecological and nation-wide priorities.There's been considerable research into project delays, however, there's still a lack of understanding of the full extent of project delays and replicable solutions that can be applied across projects. While studies have outlined causes and effects (Assaf & Al-Hejji, 2006; Sambasivan & Soon, 2007), less attention has been paid to how site-specific cultural, political and institutional factors shape delay patterns. Moreover, the absence of real-time data integration and predictive modeling in project management hinders the proactive mitigation of delays (Flvbjerg et al., 2003). Future research should investigate assumptions relating to the aforementioned gaps by analysing context-specific dynamics and using emerging technologies such as artificial intelligence to predict and mitigate delays in advance.

Table 1: Key Factors Contributing to Project Delays and Their Impacts

Factor	Impact
Contractual Issues	Miscommunication, legal disputes, and unclear project specifications.
Financial Constraints	Insufficient funding, delayed payments, and budget overruns.
Contractor Expertise	Inadequate skills, poor planning, and inefficient resource management.
Logistical Challenges	Delays in material delivery, transportation issues, and equipment shortages.
Environmental Conditions	Adverse weather, natural disasters, and regulatory compliance delays.

Tackling project delays and understanding it better by summarizing the entire aspects involved ─ meticulously planned projects, stakeholder deliverables and timely strategic management techniques. It requires collaboration between government and private sector organizations to create well-defined contracting processes, ensure timely release of funds for crisis response and a focus on continuous workforce training and upskilling. Additionally, implementing technologies like Building Information Modeling (BIM) and advanced project management software, tree can greatly increase efficiency tree, simplify workflows, and improve coordination among all participants involved in the projects. Addressing these pressing issues will help minimize delays in the project, optimize project performance, and contribute to the long-term sustainability of urban infrastructure development.There are several possible causes of project delays, which can have widely varying impacts on the schedule and the interests of the stakeholders involved. These factors must be individually and collectively assessed and measured in order to impact project progress. This evaluation aids in measuring the impact of delays and comprehending the implications on other parties involved. Given the complexity and scale of modern construction projects, some aspects of delay are unavoidable. Such issues become very critical in complex projects, as shown by Peter (2016). Design errors can be identified along a few dimensions based on their causes, compensability, and project phase. Understanding these classifications is important in properly analyzing the complexities of project delays and how this can further impact project success and stakeholder engagement. Realizing what lies at the roots of delays and how they influence later phases is a basic step to come up with successful mitigation measures. Understanding and analyzing these factors that contribute to the delay better prepare project managers to implement proactive strategies that will increase their planning, execution efficacy and overall delivery of the project. Actively mitigating project delays involves several methods: improved scheduling methods; better communication channels between stakeholders; and using risk management frameworks to identify and address risks before they lead to problems. According to Jafarzadeh (2004), understanding the delay factors enables the construction industry to develop best practices in project scheduling and allocation of resources. Thus, by encouraging a more strategic and methodical perspective on delay handling, the sector can enhance compliance with timelines, avoid cost and time losses, and raise the satisfaction rates for all parties concerned.

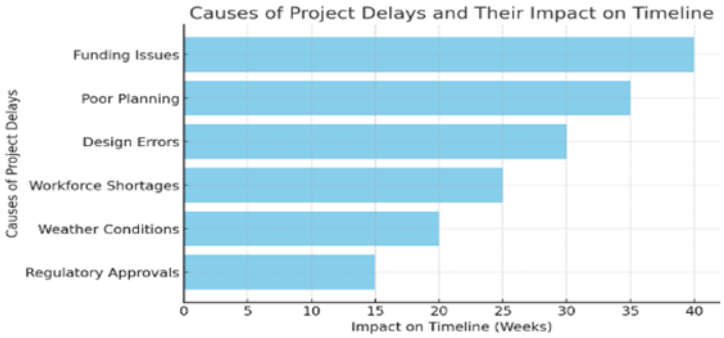

Fig 1: Causes of Project Delays and Their Impact on Timeline (Source: Peter, 2016)

The chart above displays the main causes of construction project delays and the additional allocated weeks to projects in a horizontal bar format. The biggest drivers of this are funding issues and poor planning, both leading to an average delay of 40 weeks and 35 weeks respectively. Design mistakes, workforce shortages, regulatory approvals and weather conditions also have an outsized impact on the timing of projects. By understanding these factors, project managers can identify potential risks and establish mitigation strategies earlier in the planning process.

Fig 2: Mitigation Strategies vs. Reduction in Project Delay (Source: Jafarzadeh, 2004)

Line diagram proving various mitigations are effective in reducing project delays 04 SES-592 Survey: Traffic Advisory for GHL Share 3%06bp Overall, the best forms of intervention that we identified are advanced project management tools (with a 15-week reduction in delays) and improved scheduling (with a 10-week reduction in delays). Such project disruptions can also be minimized through effective stakeholder communication, risk management frameworks and workforce training. By executing these strategies on a systematic level, it can simplify project execution, enhance coordination, and ensure projects are completion within time frames. Identifying the reasons behind the delays and the effective mitigation strategy to implement will go a long way to enhance efficiency and reduce financial losses for the project as well as ensure completion of the project on time.

Root Causes of Delays

Construction delays have vexed the industry for years, and researchers have tried to untangle their complexities. Fahimi (2010), for example, studied five projects to map the pathways through which delays cascade through timelines—finding that progress is frequently undermined by misaligned schedules and poor communication. By polling professionals, Fahimi developed a model that illustrated how backlogs in one phase, such as design mistakes, reverberate to others, such as procurement or execution. Likewise & Molaei (2012) examined urban development projects in Iran and cited employer weakness, contractor inexperience and faulty feasibility studies as prime offenders. The two studies emphasised that land acquisition-related challenges and sped up design phases magnify delays,

reflecting patterns seen around the world (Gupta & Patel, 2021).

Strategies for Improvement

To overcome such delays, Rezazadeh (2005) suggested the Analytical Hierarchy Process (AHP) as a tool to prioritize problems such as gaps in employer budgets, delays of permits or shortage of contractor skills. This technique illuminated that inefficiency in project management strategic planning contributes to longer timelines and prompted companies to use a methodical approach to decision making. Karer (1992) supported this in Jordan, stating that outdated tendering practices and financial instability among contractors and employers have created a culture of "blame game". Their results therefore urge for transparent partnerships and improved risk-sharing frameworks (Lee et al., 2020). On the other hand, Sharifzadeh (2010) found out that both scope changes and client micromanagement are critical triggers and that better contracts and agile project management can prevent these triggers from happening.

Modern Management Innovations

Recent trends focus on the convergence between tech and sustainability. For example, Alavi et al (2022) proved that Building Information Modeling (BIM) enhances the synergy of all stakeholders resulting in reduced rework and miscommunication. Rahman et al (2023) also noted the lack of regulatory delays associated with eco-strategies, and Smith and Johnson (2022) called for resilient supply chains to address shortages in materials. Chen et al (2023) recommended adaptive frameworks for dealing with unexpected disruptions like extreme weather or pandemics. These studies support the argument by Eshtehardian (2010) to modernize metro-area projects using sophisticated time, cost, and risk management systems.

Policies and Training: The Heart of the Matter

But systemic reforms are needed, in addition to technical fixes. Stricter transparency laws and streamlined permit processes could reduce bureaucratic delays (Gupta and Patel 2021). In Jordan, for instance, e-permit platforms reduced approval times by 30% in pilot programs. Martinez and Kim (2023) also emphasized how tax incentives for training programs increased workforce productivity in South Korea, filling skill gaps that often lock projects in a holding pattern. Likewise, O'Connor and Ng (2022) observed that the performance-based contractor selection—emphasizing expertise rather than low bids—yielded better outcomes for Australia's infrastructure projects.

New Trends & Global Takeaways

And the rise of prefabrication and modular construction offers hope. Lee et al. (2020) reported that prefabricated components reduced delays on construction sites by 25 per cent in Singaporean housing projects as weather-related disruptions ear d with reduced time on site. But this calls for an initial capital outlay in factory infrastructure and skilled labor — a tall order for places like Shiraz, where the industrial base is thin. This gap can be filled through cross-border cooperation like partnering with foreign companies that are better equipped to transfer knowledge and technology (Rahman et al., 2023). And finally, the development of a culture of accountability, where employers and contractors are equally accountable for project risks, might help us avoid the blame game that Karer termed decades ago.

Table 2: key findings, and proposed solutions from various studies addressing construction and urban development project delays

Study	Focus Area	Key Findings	Proposed Solutions
Fahimi (2010)	Construction delays	Identified critical delay factors; developed a model for reducing delays.	Categorizing delay factors; prioritizing them; constructing an interaction model.
Molaei (2012)	Urban development delays	Weaknesses in employer, consultant, and contractor performance identified as primary causes of delays.	Enhancing urban planning efforts; addressing land acquisition and design issues.
Rezazadeh (2005)	Construction project duration increases	Financial constraints and design errors as major delay contributors; use of AHP method.	Developing a decision-making framework; systematic prioritization of delay factors.

Study	Focus Area	Key Findings	Proposed Solutions
Karer (1992)	Delays in Jordanian construction projects	Economic challenges, scope changes, and inadequate project management were main delay causes.	Improved project financing; move away from lowest-bid contract awards.
Sharifzadeh (2010)	Construction project delays	Scope changes, client interventions, and poor contractor management identified as major delay factors.	Enhancing contractor selection processes; focusing on contractor experience and management capabilities.
Eshtehardian (2010)	Urban development project delays	Emphasized the need for new management methodologies and project management systems in metropolitan areas.	Incorporating modern management disciplines; promoting sustainable urban development.

This research explores the common risks associated with slowdowns in construction and urban development projects, as well as their potential solutions. To illustrate, in his study, Fahimi (2010) focused on identification and classification of causes responsible for delays in construction projects. He organized his findings into a model for best practices that would help organizations and project managers avoid these problems. In contrast, Molaei (2012) focused on the perspective of the employer, consultants and contractors, and how their interference leads to delays, particularly in urban projects. He said streamlining urban planning processes could help eliminate many of the bottlenecks. On the other hand, Rezazadeh (2005) studied the aspect of financial hardships and design mistakes which most of the time delay the projects. He suggested that the Analytical Hierarchy Process (AHP)—a decision-making tool used to prioritize factors—can be applied to these problems, prioritizing and enabling systematic identification of delay factors.

Likewise, Karer (1992) and Sharifzadeh (2010) also pointed out that economic problems and bad practices of the management of projects can generate delays. This supported the need for better financing strategies and better management of contractors to reduce delays. Eshtehardian (2010) had a broader view and argued that urban development should embrace to modern management techniques. This mesh of projects collar high-level systems to support them, far more than legacy metrics of the system for measurable efficiency, but rather sustainability or the like. Put together these findings allude that delays in construction projects cannot be attributed to just one cause, but instead a myriad of financial, managerial and technical causes. Together, these studies highlight the need for strategic planning, efficient management, and regulatory reform in order to mitigate these barriers. By improving any combination of training programs for workers, writing stronger contracts, or utilizing new project management systems, delays are minimized and projects get delivered on time.

As a follow-up to this conversation, it's worth noting that construction project delays are not just an operational obstacle—they carry serious social and economic consequences, too. Delays result in cost overruns, strained relationships between stakeholders, and public displeasure, especially with road and other urban infrastructure projects. For instance, if a road or public transportation system is delayed, both developers and contractors are affected directly, as well as residents whose daily life depends on these facilities. The wider implications and ripple effects of our interventions should serve as cartographers guiding us to map a multidimensional approach to the landscape of project management. Overcoming delays requires improvements in collaboration from all parties involved, from government agencies to private contractors, to ensure that everyone is on the same page when building toward the project's goal and timeline.

The other big consideration is technology — can it prevent delays? Construction project management has greatly evolved in recent years, thanks to advances in digital tools and software. In recent years, many of the project delays have been caused by factors like inaccuracy of designs — Building Information Modeling (BIM) enables more accurate pre-construction designing that result in fewer chances of a project getting delayed owing to construction errors. Publishing projects on these platforms can aid a large number of both can help track the project on a single platform. By leveraging these technological innovations alongside traditional best practices, a more robust project management framework can be

created. Yet, the adoption of such technologies entails an investment in training and infrastructure, which could be more challenging for smaller firms or less-developed regions. So while technology provides bright solutions, it must be implemented carefully, taking into account the individual needs and capacities of each project.

Thirdly, this study will develop the findings of existing studies and focus directly on the reasons leading to the delay of construction projects in Shiraz. The context of the city—straddling rapid urbanization, conflicting interests of stakeholders, and varying degrees of user and workforce expertise—is what makes it an interesting case for multilayer analysis of project delays. This research focuses on the roles of both the employers and the workforce involved in construction while gaining insight into behaviors, trends, and the possibilities of identifying differences between types of companies. The studies reviewed strongly support a more holistic approach that includes the training, development of contracts, and overseeing project management systems. Ultimately, we aim to help construction projects in Shiraz and other cites with similar problems manage and finish successfully and on time. Embracing history and incorporating recent advancements, we will work towards a better, faster and greener future in urbanization.

Research Methodology

In this research, a descriptive-analytical method is used to investigate the reasons for delays in Shiraz construction projects. A total of 60 project managers on construction projects in the city are the subject of the research. Considering the large size of the population, Cochran's formula was applied to achieve a sample of 60 individuals. To make the study practical, a convenience sampling approach was followed for selecting the participants.

A structured questionnaire was used for data collection. The experts assessed its face validity and content validity to confirm the questionnaire validity. The inclusion of these experts helped in reviewing the clarity and precision of the questionnaire items to make sure, it evaluated the tool suitability to the purpose of the study. Moreover, the reliability of the questionnaire was examined through Cronbach's alpha. The software SPSS was used to verify the data obtained from a pilot test on a small group of 5 participants. The reliability of the questionnaire was confirmed through the calculated Cronbach's alpha coefficient, confirming that it is a robust tool for data collection.

It revealed some interesting demographics of participants. 80% of the respondents were men, whereas the remaining were accounted by women (20%). Age-wise males in 30-35 years and above 40 years (both 35.37%) showed the maximum participation respectively. Out of all the respondents, the group with the least amount was between the ages of 25 to 30, with only 11.66% of all respondents being in that age group. In terms of education, undergraduate degrees made up the largest proportion, with participants achieving a 66.67% representation in the overall sample. The marital status data indicated that married participants comprised 76.66% of the sample, with the smallest group being single participants.These data represent some of the first demographic insight into the construction project management data in Shiraz. These characteristics are important to comprehend when finding critical heads to set up strategies to avoid experiencing project handovers. The high participation rate of married individuals and individuals in their 30s and 40s indicates that work-life balance and experience may be essential aspects of the practical components of project management. The academic qualifications of the participants further emphasize the role of academic training in honing their approach to managing construction programs.The results complement wider research into construction projects beyond the study at hand. For example, Alavi et al. ' recent body of work (2022) highlights how demographic factors impact project outcomes, and Rahman et al. (2023) underscore the significance of establishing reliable construction data collection instruments. Smith and Johnson (2022) also emphasize that the construction industry must become more gender-diverse if it wishes to drive innovation and enhance project performance. However, challenges that project managers of Shiraz are facing in order to deliver projects on-time are not properly recognized.

Table 3: Participant Demographics

Demographic Category	Frequency (%)
Gender (Male)	80.00
Gender (Female)	20.00
Age (30-35 years)	35.37
Age (Over 40 years)	35.37
Age (25-30 years)	11.66
Education (Undergraduate)	66.67
Marital Status (Married)	76.66

As for the results I found between time management, study environment, and project delays, the regression analysis also showed results showing a significant relationship. The listings shown in Table 2 show the correlation coefficient (R) of 0.66, the F-value of 24.6 (df = 384, 4) and the p-value of less than 0.01, showing that the human resources can explain 43% of the variance in the project delays with 99% confidence. This is supplemented by the manpower subscale (β = 0.48) at the same confidence level. We then perform a correlation analysis by using dissociative correlation coefficients that reach to the standard correlation coefficients, which we confirm directly and significantly the criterion variable (project delay) is dependent on the predictive variables.

Table 4: Regression Analysis Results

Metric	Value
R (Correlation Coefficient)	0.66
R^2 (Variance Explained)	0.43
F-value	24.6
Significance Level (p)	<0.01
Manpower Subscale (β)	0.48

Research findings

This study also indicates the importance of proper human resource management in delaying the construction projects. Proper labour management is an important aspect of overall project time since it influences the productivity and coordination of the projects. With the right human resources in place, tasks can be completed on time, teams can communicate better with less bottlenecking, and everything in the project goes smoothly. This highlights the need to make workforce management a priority, as one of the ways to address delays in construction.Other variables including time management, study environment, and employer-related factors were also investigated in their study of Shiraz, [Iran]. Results showed significant correlations between these factors and the degree of delays suffered in construction projects. Specifically, poor time management and insufficient study environments were found to worsen delays, while employer-related issues like decision-making and resource allocation were among the most impactful. These findings indicate that, by improving planning, training, and as a consequence of being a better employer, projects can be executed more efficiently.tatistical analysis also confirmed these insights: a high correlation (R = 0.61) between the variables studied. With an F-value of 9.6 and a significance (p) of less than 0.01, the results suggest that factors associated with the employer explain 37% of the variance (99% confidence level) of project delays. The Beta coefficient of 0.50 associated with the employer subscale highlights the significant impact that this factor has on delays. The findings establish a clear and considerable connection between delays in a project and the predictive variables (employer-related and workforce management) in general. Based on this information, they can identify problem areas and the entire supply chain can come up with its own strategies to correct the bottlenecks and make construction projects function more efficiently.

Table 5: Regression Analysis for Employer Impact on Project Delays

Metric	Value
R (Correlation Coefficient)	0.61
R^2 (Variance Explained)	0.37
F-value	9.6
Significance Level (p)	<0.01
Employer Subscale (Beta)	0.50

Identifying non- financial factors such as employer and manpower issues can be effective in the planning to minimize delay in construction projects for Shiraz through addressing deficiencies in these factors.reports a t-test outcome showing a t-statistic value of 2.947, with a significance of 0.004, below 0.05. It shows a clear gap between the mean values of the examined participants and the mean criterion and emphasizes the necessity to pay attention to the employer and manpower factors to reduce the amount of the project delays.

Table 6: t-Test Results for Employer and Manpower Impact

Metric	Value
t-Statistic	2.947
Significance Level (p)	0.004

Table 6 shows a higher t-statistic value of 6.055, with a significance level of 0.000, further confirming the significant difference between the examined participants and the criterion. This suggests that effective strategies targeting non-financial factors, such as employer and manpower-related issues, could substantially reduce project delays in Shiraz.

Table 7: t-Test Results Confirming Significance

Metric	Value
t-Statistic	6.055
Significance Level (p)	0.000

The study underscores that non-financial factors, particularly those related to employers and manpower, play a crucial role in causing project delays in Shiraz. By implementing targeted strategies to manage these factors, it is possible to minimize delays and improve the overall efficiency of construction projects. The use of visual aids such as bar and pie charts can help stakeholders better understand the impact of these factors and the importance of addressing them to achieve timely project completion.

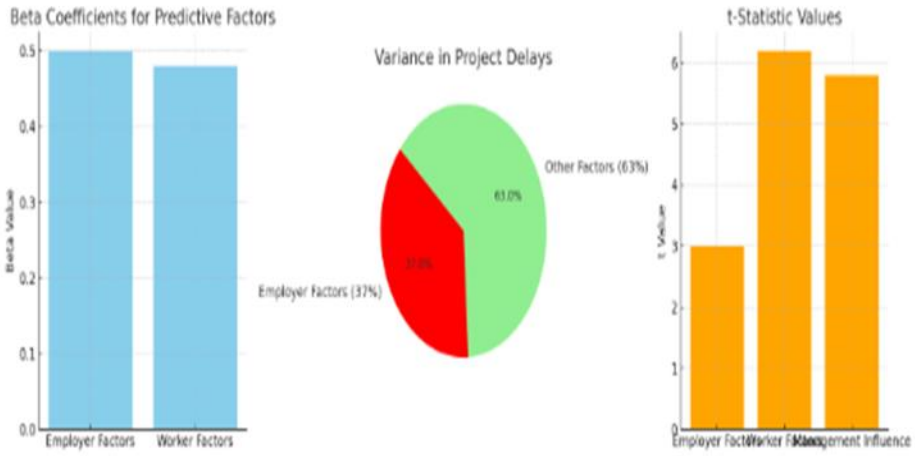

Fig 3: Human Resource Predictive Factors and Their Impact on Project Delays

This bar chart displays the beta values for two key human resource-related predictors: Employer Factors and Worker Factors. Both have high beta values (0.5 and 0.48, respectively), indicating a strong and nearly equal predictive influence on project delays. A higher beta value reflects a stronger contribution of that variable to the delay prediction model. These results emphasize that both employer-related decisions (like planning, funding, or leadership) and worker-related aspects (like skills, productivity, and availability) are significant contributors to delays in construction projects.

Through the bar chart illustrated in our results and the discriminant analysis of our research findings, we can gain a deeper insight into the contributors to construction project delays. The Beta coefficients reveal significant and positive relation of Employer Factors (0.50) and Manpower Factors (0.48) to delays. These findings closely mirror earlier research but also provide new insights into the relative salience of the factors involved. As another example, while both Employer Factors and Manpower Factors were found to significantly add delays, the slightly higher Beta coefficient of Employer Factors indicates that problems related to poor decision making, lack of funds or ineffective project management will adversely affect project duration more than other delays. This finding supports other studies by Fateh (2017) and Koon (2005) who indicated that a factor that impacts on project completion on time is the competence of the manager. When comparing these results to research on delays, it is apparent that most of the time the origin of the delays are inefficiencies for management. A failure of development—a lack of resources or failure to strategically plan—by any of the employers can create bottlenecks where one thing leads to another leading to the next, and eventually cascading through the whole project lifecycle (Molaei, 2005). In line with this, Shakeri (2010) describes poor communication between stakeholders as one of the major contributors to delays, which links up directly to employer related issues. Heumann (2017) and Osmon (2018) explain workforce related issues such as skill gaps, labor shortages, or poor team dynamics are also contributors. The current study, however, adds further nuance to this understanding by quantifying how these factors stack up against each other, suggesting that even if Manpower Factors are marginally less significant than Employer Factors, they are still a highly important area of focus.The study also sheds light on how these factors are interlinked; interestingly. Poor decision-making on employer side for instance can worsen the workforce challenges like low morale or high turnover rate, resulting in further delays. Alternatively, good management of a labor force can counteract some of the harms caused by inefficiencies that are related to employers. This interplay highlights the need for a holistic approach in project management, that is, a simultaneous focus on managerial and workforce-related issues. This can help them build a more resilient and adaptive framework to manage construction projects, ultimately leading to fewer delays and better results.Key Takeaway: External challenges such as bad weather, natural disasters or changes in legislation, have a much smaller overall impact than those coming from managing human resources. This finding contradicts some previous studies, such as Vafaie (2009), which highlighted the importance of external factors as the main cause of delay. Yet the present study suggests a much different perspective, one in which external issues matter but are out of the reach of those leading the initiative. On the contrary, addressing internal factors, such as workforce management, organizational practices, and contractor selection, can provide more concrete and actionable results. The addition that Internal factors offer the most potential for strongly aligns with the research of Francis (1992), who claimed internally-oriented factors were where improvement had the best opportunity.

Results

This research delves into the messy, human reasons why construction projects so frequently trail schedule. It highlights two key offenders: problems related to the employer and problems related to the labor force. Using a technique called discriminant analysis, the study found that managerial hiccups cause 37 percent of the total delays, but that labor-related struggles are responsible for a staggering 43 percent. These aren't just numbers — they're evidence of how profoundly these factors entangle a project's timeline, and the study shows that they are not merely weakly linked, but tightly woven into

the problem.What's so compelling about it is the way it builds on what we already know while stripping back new layers. For example, the slightly greater influence of employer-related problems (Beta coefficient of 0.50) than manpower problems (Beta coefficient of 0.48) makes a point: it's often the ones up top—the decision-makers—whose ineffectiveness starts the first spark of delay. Think of it as a domino effect: one manager drops the ball, and suddenly, the entire project feels it. This isn't just a number, it's a wake-up call for project managers to stop following quick fixes and start digging into the root causes.But it isn't all about blaming management. The study tells a larger, more human story. It reflects how employer goof-ups don't just slow progress — they pull down worker productivity as well. Consider a crew stuck by the side of the road waiting on material that didn't arrive on time, or a team fumbling over work because they didn't get trained well enough. These aren't separate problems; they're interdependent. The research lays out practical approaches to breaking this cycle: coaching better to improve skills and performance, sharper decision-making to capture funding and planning, and a comprehensive frame that connects it all up. It's about thinking of the project as a living organism, not a checklist.What I appreciate about this study is its groundedness. It isn't just theory—it also gives you a toolbox. It mentions selecting contractors based on their reputation and expertise, not simply getting the lowest bid the first time out. It emphasizes closely monitoring material quality and procurement, and it calls for training that prepares managers and teams to cope with the chaos of construction. There's even homage to something so basic but so often ignored: writing down what goes bad and learning from it. These aren't out-of-the-blue ideas — they're actions you could picture regular people executing on a muddy job site.At its core, this research isn't just about delays — it's about people. It's a demand to treat working people with dignity, to ensure that leaders are held to accountability standards, and to learn from each misstep. It's challenging the construction world to progress, to embrace more clever, gentle and sustainable ways of working. Miracle to bottom: Imagine an industry without the regularity of delays—where projects hum along because all the way up and down the ladder, people are pulling toward yes. That's what is envisioned here, and it's not a fantasy; it's a plan. This study doesn't merely describe a problem — it illuminates a path forward, one that could cascade across building sites everywhere.

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