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Research Article

The Impact of Poor Planning on The Duration and Cost of The Projects

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ABSTRACT

This study explores how inadequate planning affects the duration and cost of projects, based on a questionnaire survey conducted among project management practitioners. The survey aimed to evaluate the impact of poor planning on key project outcomes, including risk forecasting, project success, and overall cost and time efficiency. The results show that 55.8% of respondents believe that poor planning significantly impacts risk forecasting, while 60.4% reported a major negative effect on overall project success. In response to these challenges, project management teams implemented various mitigation strategies, with 34% focusing on enhancing communication and 26.4% reorganizing execution phases and increasing fieldwork.
Additionally, when reflecting on lessons learned for future projects, 77% of respondents recognized that they gained valuable insights, while 23% indicated only partial learning. The findings emphasize the crucial role of effective planning in reducing delays and cost overruns, as poor planning was seen to significantly increase both. This highlights the necessity for better communication, strategic reorganization, and more flexible planning processes to ensure successful project delivery. In conclusion, the study illustrates that effective planning is vital for project efficiency, and failing to plan adequately can lead to heightened risks, extended timelines, and increased costs, making it a key area for ongoing improvement in project management.

1. INTRODUCTION

It has been established that planning is the most crucial element in the management of projects. Planning is a process of developing a framework for achieving the project's goals by stipulating activities, resources, time frame, cost estimates, and methods of monitoring and controlling. By doing so, it gives all stakeholders a direction to follow and makes sure that the project is on track. Key Impacts of Effective Planning is:
Time management: A well-structured plan has goals and timeframes and can help teams monitor the progression and adapt the schedule if necessary. Another advantage of planning is that it minimizes or eliminates waits since it takes into consideration areas that are likely to have traffic jams and ensures that resources are adequately marshalled [1].
Cost control: Both accurate budgeting and financial forecasting are also important elements of proper planning. Since costs need to be estimated in advance and risks are anticipated, project managers may prevent the project from attaining a bloated price range. the research which reveals that according to the surveys, only 18% of the projects are successfully completed within the set budget [2]. Proper planning also helps in minimizing the financial risks involved because the projects are kept financially sustainable [3].
Resource Optimization: It keeps track with human resource, financial and any other necessary resources needed in the implementation of the plan. It makes it possible to harmonize actions, avoid replication and duplication as well as enhance efficiency. They allow for the optimal utilization of human, financial, and material resources in order to enhance output and reduce costs [4]. Effective planning for the coordination of efforts improves operational effectiveness is vital to attaining competitive advantage [5].
Risk Mitigation: Risk assessment in the planning phase is vital in the creation of the risk management plans that can avoid or at least reduce the occurrence of risks during the implementation phase. This prevents avoidable delay which would have been very costly [3].
The challenges of managing projects are that poor planning could bring several undesirable effects such as delays and costs. When the goals of the project are not clear the workers can be working in the wrong direction, then more time is taken as the energies are shifted. Inaccuracies in time scheduling and planning cause setting of wrong time frames and hence fails to meet stipulated time effectively hence lengthening project duration. When resources are not effectively managed, there can be issues such as over-proportioning or under-proportioning of resources to specific tasks that render tasks to take more time than necessary

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or end up congesting the project plan [6]. Due to poor cost control, the cost estimates are usually inaccurate, and possible risks are ignored, leading to cost escalation. Such costs are incurred due to changes as consultants need to make modifications at the last minute, purchase something on an emergency basis or require more resources to complete work within the stipulated time. Schedule problems affect mainly undesigned projects which include rework problems due to lack of requirement definition, coordination, or quality assurance which results in increased expenses. Among various factors affecting costs, longer project duration presents the most logical explanation, as this means that the team has to work longer than planned to deliver the project on time [7].

Delays are one of the leading causes of cost overruns in construction projects across the world, and there are various factors that cause the exceedance of the budget. Lack of proper planning and failure to accurately estimate costs are other common reasons [6]. It is also argued that other design factors such as frequent changes and other instances where designs are incomplete also contribute to high costs [8].

Since planning and management are one of the key competencies in projects, the performance of the participants involved needs to meet the standards required in the project. There is also inflation and fluctuations in the price of materials where financial issues lead to overspending [3, 7]. The cost aspect of construction may also be impacted by aspects such as site conditions, weather among others [8]. Also, changes in scope and delays in payments for progress further complicate cost concerns [9]. It is important that these factors are tackled employing better planning, appropriate cost estimates, and efficient project management in order to keep construction costs within allowable limits.

The purpose of this paper is to review the theoretical implication of poor planning on temporal and cost related aspects in/to projects.

2. LITERATURE REVIEW

Construction projects sanctions worldwide frequently have last cost overruns because of risks and delay in work sequence implementation. This is an issue of much contention between owners and contractors since it plays a critical role to do with the preparation of project costs and is a major issue of concern in terms of addressing risks and the successful project delivery [10, 11].

Various theories and models have emerged to address the complexities involved in these areas, particularly in optimizing resource use and ensuring project success.

2.1. Project planning and resource allocation

In Allu et al., (2024) study shows that the efficiency of business operations is an essential component that affects company performance. The impact of resource efficiency on profits and how it enhances the concept of leveraging profitability. Resources can be defined as something that is available in a fixed amount for particular activities, and proper control of resources required for organizational activities, such as planning, scheduling, and selection, can enhance the efficiency of operational efficiency [4].

The intuitionistic fuzzy set theory enables the incorporation of the hesitancy and uncertainty of the decision-maker concerning the number of project completion for successful budgeting. This approach not only helps in finding the best schedules but also measures satisfaction degree considering budget and timescale, accordingly, thus improving the project management performance [12].

In Yusifov S. et al., (2023) study results that the use of interval-valued fuzzy sets allows for the evaluation of project feasibility, even in situations where the initial data is uncertain, provides a comparative evaluation of the options, and reduces the number of resources required [13]. This method is most effective in coordinating between time, cost and quality as will be seen in projects that have adopted crashing and overlapping [14].

The approach of fuzzy ranking this resource with the help of genetic algorithms helps in the optimization of the process in leveling the resources which are very much uncertain in the case of project timelines and resource utilizations [15].

The theory of fuzzy sets in pelican et al. (2018) study, had been adopted on the planning of the projects, which facilitates in the management of the available resource workloads being uncertain and which may not be detected in the deterministic approaches [12].

This method helps in maximizing the use of available resources and this is very important when it comes to the management of projects. Although applying fuzzy set theory promises a level of superior benefits especially in controlling project risks and uncertainties, it is important to note that changing the conventional approaches in managing projects may prove to be quite cumbersome for practitioners trained and accustomed to more deterministic practices [12, 16, 17].

2.2. Resource leveling and scheduling

Resource leveling is another technique used to improve the project schedule in situations where the resources are scarce as it is seen in construction management. Analytical Techniques such as the Multi Attribute Decision Models like the Analytic Hierarchy Process and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) have been useful when it comes to improving the scheduling in that it creates the right balance between time and cost [18].

The investigations of Aristotelous and Nearchou (2024) further reveals that resource leveling utilizing hybrids of differential evolution, genetic algorithms, and swarm particle optimization is much more effective than conventional approaches; consequently, project performance is enhanced [15].
Clustering Algorithms: While integrating clustering methods such as K-Means or Fuzzy C-Means into scheduling models, in multi-skilled resource-constrained projects an improvement is noted in the management of resource demands [19].
Genetic Algorithms: In itself, the Hybrid-Chromosome NSGA-II model has made improvements in multi-project scheduling through its capability of meeting resource constraints and leveling computations efficiently [20].
In a study, due resource levelling can help to achieve a 24% increase in efficiency of schedules. 90 per cent reduction of worker payments and a 33. Sodikin et al., (2023) revealed that there is an increased rate to project development that is by 35% Acceleration [21].
However, there are some issues with these models, namely in their application for resource leveling with relation to obstacles in practice or changes in various conditions of the project.

2.3. Project duration and cost overruns

As Koirala & Shahi, (2024) study resulted that, delays in time schedules, which also affected costs, were due to factors such as weather conditions and lack of adequate oversight on the project site, with Project cost overruns were reported in 73% of the projects [22].
Pallavi, (2023) research reported that the key causes of cost and time overruns include improper project management and design changes which call for proper estimation of time and expenses as well as effective strategies [23].
Sri Lankan building projects Kumarathunga et al., (2023) study, revealed that unsound project duration decisions made during bidding dramatically result in cost overrunning, through claim, disputes, and more specifically, excess or inadequate timelines equally lead to further delays [24].
The case of Nairobi Road construction sector indicated that lack of proper project plan leads to cost overruns The study suggests that in order to avoid such kind of risks strategic planning is very important [25].
In Omran et al., (2023) exploratory factors that included inexperience in leadership, management, and delays in information flow across the project as the major reasons why their projects went over budget, which underlined a requirement for the improvement of project planning [26].
These studies focused on the project duration and cost overruns without failure acknowledging the fact that every project did not stick to these conditions. Thus, the analysis indicated that local conditions, management practices and project types and sizes may yield different results, which provided the evidence of the suitability of the model for project management taking into regard that it may need some local adjustments depending on certain conditions.

3. THEORETICAL FRAMEWORK

3.1. Planning Process

The planning processes are essential in determining the form of implementation of any project regardless of the engineering discipline involved including civil engineering projects. They include establishing project goals and objectives, outlining project scope, establishing project schedules and timelines, determining resources and allocating them, identifying and managing risks, estimating costs and budgets, and engaging stakeholders and communicating with them [27]. Identifying activities is another important aspect to consider during the project planning phase since it helps to define project objectives. Work [28]. Breakdown Structure (WBS) is created in order to decompose the project into the manageable pieces that would highlight the organization and distribution of the resources [29].
Time management and scheduling are part of the project planning process whereby methods such as CPM and Gantt charts are used to represent the relationship between tasks, set realistic durations and timing estimates for a project [30]. In this regard, scheduling is helpful in achieving efficiency and avoiding problems which may cause a certain set of processes stall or slow down, thus affecting the rest of the project [31].
Resource management and especially scheduling involve the right and timely procurement of resources such as materials, people, and tools in relation to the project. Proper allocation ensures Productivity while eliminating interruptions [32]. Planning involves risk assessment because some of these aspects involve looking at the probability of risks occurring and the likely consequences [33].
Budgeting and cost estimation are also factors that are very important in the success of any project. During the planning phase, project managers approximate necessary costs such as spent on employees, materials, tools, and other requirements [34]. A realistic budget and contingency fund are pertinent to the effective utilization of the financial resources and to avoid the vice of developing budget overruns [35]. Finally, communication and consultation with the stakeholders are important in the planning process all the time. It is a formal plan that ensures all the participants involved in the project are in the know of the progress, changes or any emerging incidents that may affect the project. Face-to-face meetings with frequent

progress reports and concerns both are solved during these meetings. When stakeholders are involved in the planning phase, they give their feedback and do not have wrong impressions as to what the project will involve [36].

3.2. Cause of Poor Planning

There are several factors which cause poor planning in projects which in turn influence the cost and time cycle of the project. Here's an overview of some common causes:

- Unrealistic deadlines Estimation of inaccurate or unattainable targets that cannot be met within timelines or resources available for completion of project is another common problem in planning [37]. This sometimes occurs because of stakeholder pressure or plain ignorance of the fact that the project is a large endeavor. Gutted deadlines result in work being rushed, corners being cut and then usually if there are complications that were not foreseen during the schedule creation the project is delayed again [38].
- Inadequate resource allocation: Manpower, equipment, and materials are some of the resources required and proper resource management will help reach the end goal (2). Lack of planning in these resources can occur through underestimation or improper allocation leading to the slow completion of goals, decreased efficiency and high costs that accompany goals completion with inadequate means (44).
- lack of Stakeholder Involvement: Clients, sponsors and the rest of the team must be involved throughout the planning process. The absence of stakeholder participation can result in the achievement of goals that do not meet the expectations of the stakeholders, lack of proper briefing on the needs of the project, changes in scope that affects the schedule and costs. Stakeholder management enables organizations to ensure that stakeholders have well-defined specific expectations in regard to the resources that will be provided [39, 40].
- Insufficient risk management: There is always a certain level of risks involved in projects and if the risk management is not done during the planning phase, then the project teams can be easily faced with certain risks [10]. This is more so in project planning where lack of proper risk anticipation deprives the project of contingency plans, and hence more delays and cost implications arise when something could have been avoided [41].

3.3. Impact on Project Duration and Cost

Inadequate schedule definition can contribute to unrealistic deadlines due to either lack of appropriate definition of work or external forces that create a 'crash schedule' implying that a work must be done in time that is actually less than what it would reasonably take [10]. As stated by PMI, when timelines are set tight, it puts a lot of pressure on the team, and they end up making hasty decisions on tasks and end up redoing them or deliver poor quality work thus extending the given project's time and cost (PMI, 2021).
Delays and cost overruns are typical issues in large scale public projects and here we have examples of Berlin Brandenburg Airport and Swiss National Exposition Expo. 02. They might use 'salami tactics', that is, issuing one small invisible increment at a time in order to control the blame game [42]. Planning and technical problems, especially regarding the fire protection system made the Berlin Airport project also a rather long duration and higher cost than earlier estimated [43]. Another cause of project termination is political influence, that can be seen in the case of the Mexico City New International Airport project which was terminated due to political polarization even though the construction was in progress [44]. To overcome the problems at operational level, some airports are considering innovative strategies. For example, Denver International Airport is using the machine learning approach to provide early/initial warning of missed approaches besides helping in the optimization of approach activities [45]. These cases show the interaction of political processes, project and technological processes in complex large-scale airport projects.

4. PRACTICAL FRAMEWORK

The practical framework of this research relates to the investigation of effects of poor planning on the construction projects in terms of time and resources. In order to collect data, a questionnaire was prepared and administered to professionals involved in project management and included questions on several guides aspects of poor planning, such as its impact on the durations, cost, risks and success of the project.
The objectives of the survey are to establish the extent to which poor planning affects the major project performance indicators, to determine the project phases that are most impacted by delays due to poor planning and to assess the impact of poor planning in terms of costs. Further, the survey seeks to establish the leading contributors towards poor planning and measures taken to counter the impacts.

4.1. Key Survey Areas and Question Design

The percentage of the question was created depending on the studies below:

Research that was conducted on the Polresta Denpasar project showed an increase on the 9. 35% delay due to planning problems pointing to the fact that even small problems compounded may snowball [46]. Less than 10% suggest that due to poor planning, delays or cost overruns occurred, but their effects were negligible. This percentage is normally observed especially if the issues being reported are in areas that can be considered as minor problems that can be controlled.

The study on the impact of poor planning on the project duration and costs revealed that poor planning results in an average of 10-20% increase in project duration and the studies are as follows. Lack of adequate planning tends to worsen such problems as late information exchange, inadequate information, and problems in the proper distribution of resources which if continued accumulation, leads to increased costs and time overruns. For instance, villa construction research showed that time overrun, and cost overruns because of inefficient planning and scheduling cause resource over-proportioning and communication barriers [47]. This range indicates clearly that poor planning has taken place though it is not significantly detrimental to the project. It may include such factors as communication breakdowns or absence of some information which is important to some aspects of the project.

Some research shows that planning deficiencies are costly and detrimental to the time estimates with a considerable consequence of extending the average duration by more than 30 percent. Such an increase can seriously affect the estimates of time and money and in most cases leads to project failure. Lack of planning is one of the major causes of time overrun since 52% and 43% of projects are reported to overrun the planned time. Regarding the delay percentage, 17% of projects were delayed with the percentage varying from 24% [48]. Design failures due to improper planning cause construction timelines to be elongated and alter planned workflows and procurement schedules [49].

One effect that is seen is that of the economic consequences of poor planning, where there is an added concern of increased cost 21. 73% of projects with research pointing at the relationship between planning gaps and budget overruns [48]. This percentage points to a very significant influence on the project and may lead to extreme alterations in the time and cost frames. Such problems can result in project delay or increase costs and, at times, can even lead to project failure.

The first part of the questionnaire controls the influence of the lack of proper organization and planning on time management in projects. This is after participants had been required to predict the approximate percentage by which the project time is likely to be affected due to poor planning, they were also required to indicate the most affected phase of the project. These questions assist in identifying whether the preparation phase, the implementation phase or the closure phase is more prone to planning failures.

The second set of questions relates to the consequences which affect the financial aspects of organization planning. They were asked to approximate an extent to which project cost was inflated by poor planning, and which aspect of project cost, be it labor or material or equipment, was most significantly impacted. These questions are important regarding the purpose of explaining how and why a poor plan could have led to an overrun in cost.

Interviewees were further asked to state some of the reasons that they attributed to poor planning. The choices available were lack of data, poor communication, and shifting goal posts of projects. These questions will be used to draw attention to why planning fails and how these failings fit into the HSE project life cycle.

The following questions assess whether or not risk management techniques have been effectively applied in reducing impacts of poor planning. Regarding the analysis of the role of risk management in risk management for potential delays and cost of implementation, respondents were asked to.

This section aims to highlight measures that are taken by project managers to avoid adverse effects of poor planning as evidenced in the subsequent sub-sections. It offers information on how some of the strategies which have been helpful in eradicating delay and cost control has been realized despite challenges during the planning aspect.

The last set of questions in the survey is aimed at finding the general effects of lack of planning on the success of the project. Specific questions posed to respondent involved assessment of the project outcomes and the potential of RTF in the enhancement of the project as well as whether there was an instance where poor planning caused by RTF was rectified in the subsequent project.

4.2. Data Collection

The survey questionnaire was administered to individuals employed in construction or project management-related positions, such as project managers, engineers, and consultants. The total number of responses obtained for the current study was 53 responses over a period of 30 days. Both qualitative and quantitative data were collected and analyzed to gain an understanding of the effects of inadequate planning on the time and money required to complete a project.

5. RESULTS AND DISCUSSION

The established objectives of the research results are to map the effect of a poor planning factor on the project time horizon and cost overruns of engineering projects, which is an important issue of project management. The survey is conducted among professionals in the construction industry: this means that the findings shed some light on how lack of planning impacts other sections of the process - timeliness of the phases, costs, utilization of resources and the like.

This research aims to identify the most common issues associated with poor planning and to understand its broader impact on project success. The study focuses on estimating the extent of delays and cost overruns, pinpointing the primary causes of insufficient planning, and evaluating the effectiveness of project managers' strategies to mitigate these issues. By examining these factors, the research highlights key areas where improving planning processes could lead to better project

outcomes. The findings will be discussed in the following sections, providing a deeper insight into the practical implications and their connection to the study topics.

5.1. Overview of Respondent Demographics

The participants in this study come from various professional backgrounds, encompassing a wide array of roles in engineering and project management. These individuals include project managers, engineers, planners, and supervisors, each of whom contributes significantly to the planning and execution of projects. This diverse mix of professions guarantees that the data gathered reflects multiple viewpoints on the effects of inadequate planning, spanning from strategic oversight to direct project execution.

In this survey, the ages of participants varied from 22 to 60 years, showcasing a range of age groups included in the study. A significant portion of the participants, 67%, were government employees engaged in engineering construction project sites. The other 33% were private sector employees, contributing to the study's diversity in terms of the respondents' professional backgrounds.

In terms of years of experience on engineering project sites, the findings revealed that:

- 45% of participants had between 1 and 10 years of experience on construction projects.
- 40% had between 10 and 20 years of experience.
- 15% had more than 20 years of experience on engineering project sites

This distribution highlights the diversity of experience among the survey participants, offering valuable insights into how poor planning can affect project duration and costs. Table 1 presents a detailed overview of these demographic characteristics.

TABLE I. DEMOGRAPHIC CHARACTERISTICS OF SURVEY PARTICIPANTS

Ages	Percent (%)	Number of Participants
Ages		
22-32 Years	%30	16
33-43 Years	%36	19
44-54 Years	%23	12
55-65 Years	%11	6
Sector		
Government Employee	% 68	36
Corporate Employee	% 32	17
Years of experience		
1-10 Years	% 45	24
10-20 Years	% 40	21
More than 20 Years	% 15	8

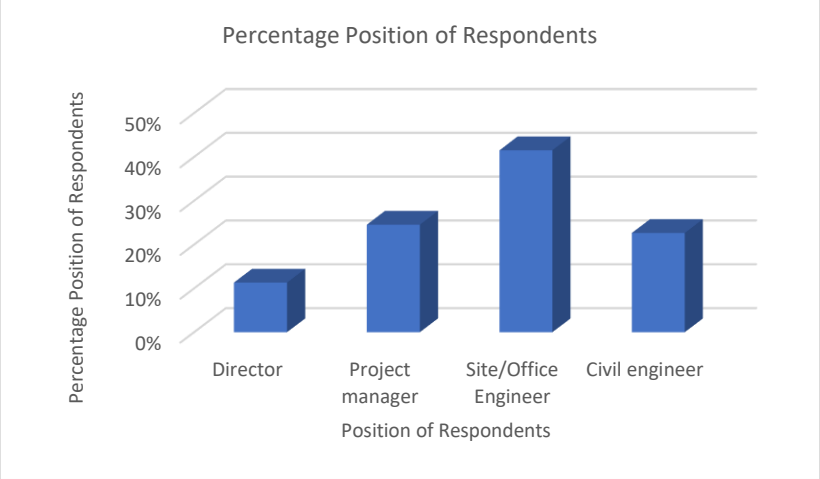

Fig 1. Percentage Position of Respondents

5.2 Analysis of Survey Responses by Demographics

These main findings are evident from the survey responses at striking disparities in the perceived effects of poor planning in relation to experience level, age, and employment sectors that included the government and corporate institutions. This

demographic analysis helps understand more opinions and point out particular areas in which the mentioned planning shortcomings are recorded with different frequencies.

TABLE II. SURVEY RESPONSES AS REGARDS THE POLITICAL IMPLICATIONS OF POOR PLANNING ACCORDING TO DEMOGRAPHIC CHARACTERISTICS

Demographic Group	Perception of Poor Planning	Reported Impacts	Recommendations
Experience Level	1-10 Years: Little understanding of the effects of a strategy in the long run.	Minor_time And Costs: ; Minor Interference with Success.	Training of planning skills for developmental-stage workers.
	10-20 Years: Quite elevated; experience in planning.	The respondents noted that there are regular difficulties in the distribution of resources, and time management.	Majority of current methodologies advocate for early-phase planning to mitigate on the occurence of inefficiencies.
	20+ Years: Awareness; more critical when there are perceived inadequacies in planning.	Termination of services and activities for a long time along with other related expenses resulting total negligence.	Tap the veteran to get his/her opinion in high level planning.
Age Group	22-32: Hopeful of practical changes	Modest delays and cost through the application of agile systems.	Agile, adaptive methodologies should be also used to be as flexible as possible.
	44-54: As pointed out earlier, the criticism of poor planning is a major problem of modern organisations.	One large pronouce weakness is resource mismanagement, which results in high levels of delays and cost overruns.	Improve pre-execution planning and risk evaluation for a project.
Sector	Government: Mechanical formal planning structures.	A number of drawbacks are seen in the case of PMP: significant cost overruns and delays; limited flexibilities.	Cascading and other supervisory approaches that would replace sheer hierarchy.
	Corporate: Strategic, non-static bulk planning processes.	Some amount of delay; flexible to changes in its scope and client expectations.	Concentration on proactive, systematic approaches, which are employed in decision making.

As shown in Table 2 the responses of the survey show significant variations of perceived outcomes of poor planning based on the respondent's experience, age and employment status or in government or corporate institutions. This demographic analysis reveals the differences in outlooks and defines the issues related to planning deficiencies as seen with different levels of concern.

Experience Level: The responses to questions related to perceived poor planning are shown below and revealed a bipolar distribution, with senior staff reporting far more instances than junior staff. Employees who have been in the field for more than two decades showed better understanding of the negative effects of poor planning on a project's schedule and budget. These professional workers affirmed that they were experiencing higher rates and deeper levels of concerns on resource misapplication and timetable complications, all of which they blamed on early-phase planning inefficiencies. This demographic was most sensitive to the error integration when minor planning difficulties continued to mount, some that had a dramatic impact on time and cost consequences when the project is in its middle or later phases of execution.

Nevertheless, planning issues in respondents 'consideration tended to be seen as occasional among respondents with 1-10 years of experience, probably due to their less involvement with the strategic level of project planning and resource management. In general, it was observed that this group suffered less direct consequences due to planning and implementation on project success, though they recognized that poor planning could result in delay and subsequent higher costs of the project, a problem they might have encountered with little intensity, as they revealed marginal contact with the consequences of large-scale planning and implementation. This points towards a possible avenue for specific intervention, therefore it would be useful to focus specifically on planning as an aspect to train the early careerist to eliminate Imprecise planning in the long term hence affecting efficiency of the whole project.

Age Group: The responses also demonstrate pattern by age. In order to understand the different responses recorded across the age groups, the participants were further categorized as follows: The respondents most critical of poor planning were aged 44-54 years; 78.3% of this population bracket attributed poor planning as main cause to project delay and cost escalation. This group commonly consists of middle to senior employees who control project phases in which planning mistakes are apparent in scheduling and poor cost control. It is important to note, therefore, that they also pointed to specific areas, for example, resources and risks as being common concerns and underscored the desirability of detailed pre-execution planning to prevent workflow interruptions.

On the other hand, the respondents falling under the young age group (between 22-32 years) seemed to have a positive attitude towards accommodating the planning deficiencies perhaps due to liberal attitude towards project planning maybe due to flexibility, or ability to apply adaptive project management methodologies. This group may have been more supportive of the concept of tying together many small changes such as in phased modifications and changing planning

frequency at a faster rate gathering than supporting overall upfront planning. Nevertheless, this demographic understood the value of preparation but considered poor planning as a workable problem that can be corrected during project implementation.

5.3. Increase in Project Duration Due to Poor Planning

Average increase in duration: The analysis of the survey responses provided valuable insights into how poor planning contributes to longer project durations. The data showed that:

13.2% of respondents noted an increase in project duration of less than 10%.

- 43.4% reported delays in the range of 10-20%.
- 22.6% experienced delays between 20-30%.
- 20.8% indicated delays exceeding 30%, with some noting increases of more than 54.7%.

As shown in Figure 2.

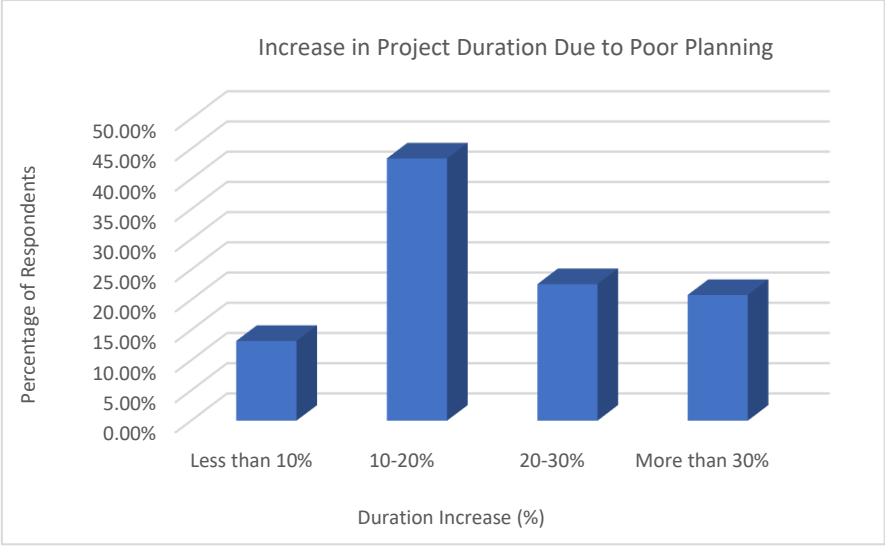

Fig. 2. Increase in Project Duration Due to Poor Planning

These results highlight that a significant number of respondents (around 66%) faced delays of 10% or more, emphasizing the negative effects of insufficient planning on project timelines. The most common delay range was between 10-20%, suggesting that poor planning is a widespread issue that often results in considerable project delays.

The result shows that the idea that thorough project planning is essential for avoiding delays. Certain phases, like the preparatory and execution stages, are particularly impacted for several reasons: The preparatory phase frequently struggles due to inadequate resource allocation and scheduling, which can result in miscommunication and oversights. When these elements are overlooked, it can trigger a chain reaction of delays in later phases. This is also what reached by Gunaga P. et al. (2023) [47].

Numerous studies [50, 51] highlight poor planning and scheduling as key factors contributing to delays in construction projects. It's common to see delays of 10% or more, with the most typical range falling between 10-20%. The execution phase is also at risk, as poor planning can lead to unexpected issues, ultimately prolonging project timelines. Evidence indicates that having clear and detailed plans from the outset can greatly minimize these risks, as such planning serves as a guide for successful project execution.

Phases Affected by Poor Planning:

Poor planning during the preparatory phase, such as setting the scope and preparing the budget, can cause significant issues later in the project. Factors like inadequate risk assessment, poor communication, and incomplete design documentation can negatively affect this as indicated in Shabir R. et al., (2023) study [52].

A lack of thorough preparation directly impacts the execution phase, with 15 % of respondents noting that it is significantly affected as shown in figure 3. In the execution phase research indicates that insufficient financial resources and ineffective communication are major factors contributing to delays [53]. Utilizing digital tools can mitigate these delays by enhancing the accuracy of planning [54].

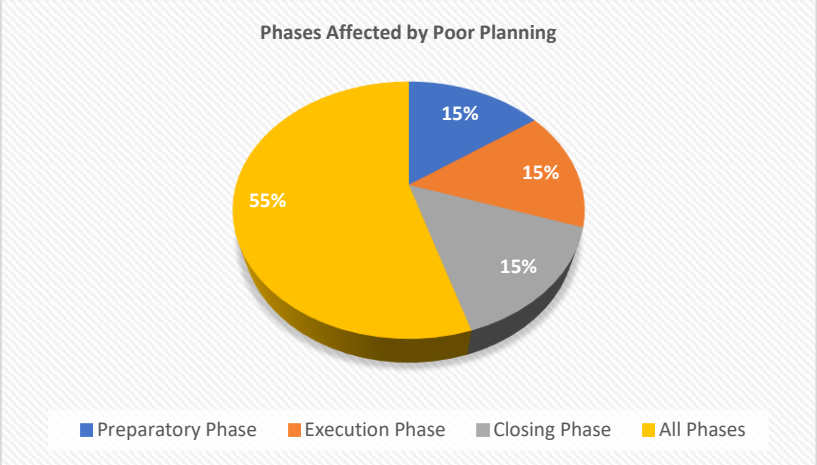

Fig 3. Phase Affected by Pool Planning

In the closing phase, 15 % of respondents indicate that insufficient planning from earlier stages can lead to rushed or incomplete closure activities. Overall, poor planning has a major impact on the entire project lifecycle, with 55 % of respondents acknowledging that every phase is affected. It is crucial to engage in comprehensive and methodical planning at the beginning to avoid problems that can disrupt timelines and budgets. During the execution phase, misaligned resources and delays can obstruct workflows and create inefficiencies. In the closing phase, inadequate planning can result in hurried deliverables, incomplete documentation, or the need for rework, ultimately reducing client satisfaction.

5.4. Impact on Project Cost

Table 3 shows how respondents reported their cost increases. The largest group, 44.2%, indicated that poor planning resulted in a cost increase of between 10% and 20%. Furthermore, 32.7% faced increases ranging from 20% to 30%, suggesting that a significant majority (76.9%) encountered moderate cost overruns due to planning issues. The extremes, with increases of less than 10% and more than 30%, each represented 11.5% of respondents, indicating that for some projects, the effects were either minimal or quite severe.

The findings indicate that inadequate planning significantly influences every stage of the project lifecycle. Notably, 54.7% of respondents believe that all phases suffer from poor planning, suggesting that problems in one phase frequently trigger a chain reaction of issues in subsequent phase.

TABLE III. DISTRIBUTION OF COST INCREASES DUE TO POOR PLANNING

Cost Increase Due to Poor Planning	Percentage of Respondents (%)
Less than 10%	11.50%
Between 10% and 20%	44.20%
Between 20% and 30%	32.70%
More than 30%	11.50%

The data indicates that most projects experienced moderate cost increases ranging from 10% to 30%. This suggests that while poor planning can lead to noticeable overruns, they are often not catastrophic. However, the fact that 11.5% of projects saw cost increases exceeding 30% highlights the critical need for careful planning, particularly for larger or more complex initiatives, where the consequences of planning shortcomings can be significantly more severe. On the other hand, 11.5% of projects managed to keep cost increases below 10%, suggesting that despite planning challenges, some projects were able to effectively address issues, likely through timely adjustments or interventions during their execution.

This is consistent with what is found in project management literature [47, 53], which indicates that inadequate planning during the initial stages, particularly in the preparatory phase, can result in significant inefficiencies during the execution and closing phases. It is also clear that comprehensive and methodical planning at the project's outset is essential to prevent issues that can affect both time and budget [2].

Materials were not far behind, with a 37.7% increase. Labor and transportation/logistics each made up 11.3% of the cost increases, indicating that their impact was comparatively less. In Husin et al., (2017) [55] also showed that labor and

transportation/logistics play a role in cost overruns, but their impact is relatively minor. Different studies show that the frequency and importance of these factors can vary, yet design failures, changes in material prices, and insufficient planning often rank as the primary causes. Recognizing these factors is vital for formulating effective strategies to reduce risks and improve project outcomes [56]

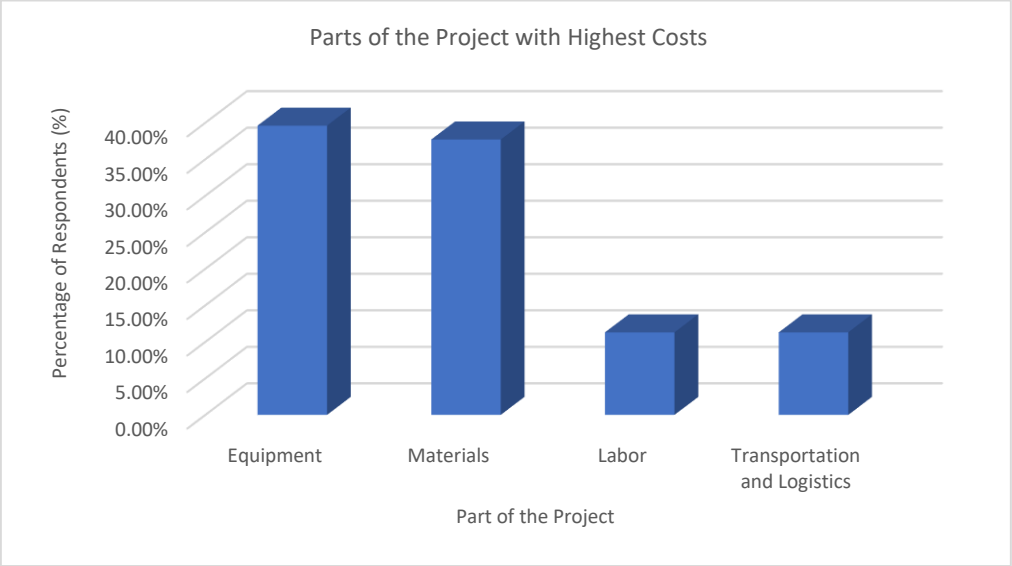

Fig. 4. Parts of the Project with Highest Costs

The observation that equipment (39.6%) and materials (37.7%) show the most significant cost increases suggests that these factors are particularly affected by inadequate planning. To alleviate these issues, project managers should concentrate on accurately predicting equipment requirements, considering potential delays or maintenance challenges, and ensuring that material estimation and procurement processes are precise. A case study of a road project in Egypt showed that inadequate equipment management caused actual productivity to reach only 50% of the expected rate. This mismanagement resulted in a 71.5% rise in costs and a 72% extension in project duration [57].

These insights emphasize the necessity of meticulous cost estimation and resource management for equipment and materials. By improving forecasting practices, conducting in-depth market analysis, and preparing contingency plans, project managers can better manage unexpected cost escalations in these areas.

The notably lower percentages for labor and transportation/logistics (11.3% each) indicate that these sectors are usually less impacted by inadequate planning or can be more effectively managed when problems occur. Although labor and logistics remain crucial elements of project expenses, these findings imply that the potential for cost overruns in these areas is generally less significant than in equipment and materials.

This suggests that project teams may have a clearer grasp or better management of labor and logistics expenses, or these costs could be more stable. However, it is still crucial to maintain focus on workforce planning and effective logistics management to prevent any possible cost hikes. Research suggests that onsite construction logistics and production control techniques, such as push and just-in-time methods, can significantly impact crew performance and labor productivity [58].

Projects that face significant cost overruns in equipment and materials could gain from enhanced risk management practices. By recognizing potential risks tied to supply chain issues, equipment malfunctions, or price changes early in the project timeline, teams can lessen the financial consequences of inadequate planning [59].

Utilizing effective planning tools, including comprehensive cost estimation software, risk management frameworks, and strategies for engaging suppliers, should be emphasized to prevent the common overruns linked to equipment and materials [60].

5.5. Cost Overrun Breakdown by Resource Type

According to the survey results, the following table shows that poor planning results in high levels of cost overruns across various resource types, majoring in equipment and materials then labor and logistics. Examining these cost overruns and unfavorable trends offers even more understanding of how planning inadequacies impact direct and indirect cost of a project.

The details of the cost overruns according to organizational resources as captured by survey respondents are presented in the table below. Equipment and material became the most impacted category related directly to the increased cost of

projects while increase cost of manpower and transportation added to the indirect cost imposing impacts to the project budget.

TABLE IV. COST OVERRUN BREAKDOWN BY RESOURCE TYPE

Resource Type	Percentage of Respondents	Impact Description	Examples/Consequences
Equipment	39.6%	Unused tools, slowdowns in availability	Higher costs bearing by operations function and idle assets
Materials	37.7%	More specifically, stocks in excess of set quantities result in spoilage or poor-quality goods.	Extra acquisitions, the decrease in materials' utilization as a result of delays
Labor	32.7%	The costs related with overtime, rework, and inefficiencies	Payroll costs will be higher, productivity will also be lower when working to meet tight deadlines.
Logistics	Smaller percentage reported	Transport problems and wrong resource allocation	Delivery delays, additional expenses for delivery redirection or for the fast delivery

Direct Costs: Equipment and Materials:

The second most common respondent regret for a poor plan potentially exists in equipment and materials costs; 39.6% of participants stated that equipment costs were sensitive to planning. Lack of proper planning normally makes equipment lie idle and hence incur more overhead costs since machinery just waits for the right time to be used.

Likewise, material costs were mentioned by 37.7% of respondents as the major causes of budget overruns. A lot of the time, the company will order too much material because the forecast is wrong or resources are allocated wrongly, leading to wasted material or items that must be scrapped because of fault. For instance, schedule delays within project phases create situations where materials become unsuitable to use because they have degraded or gone bad and require replenishment. Some of them are project costs are increased due to inflation of various expenses and lack of subsequent budgetary discretion.

In a highway construction project, there might be a delay in the planning of the construction activities, this will affect the actual construction process such as laying of asphalt, where due to poor planning of the construction timetable some of the materials, which have been pre-ordered, encounter and deteriorate due to influences of environmental factors. This situation not only increases the costs of materials, but also subsequent phases, which aggravates the overall effect [55].

Indirect Costs: Labor and Logistics

Respondents highlighted that labour cost reductions were claimed to be influenced by 32.7% with rework, overtime and the requirement to hire extra workers due to failures of initial planning of the schedule. Scheduling problems entail added time duration and resource intermissions which results in project managers spending additional hours to address the issues. This raises the payroll costs and, or, the standard of output reduces since the employees may be stressed, or not very efficient when under pressure.

Like in the case of utilities, logistics was mentioned by a much lesser number of respondents, however, remain as one of the indirect costs that cannot be overlooked. Lack of planning often leads to the disruption of the transport schedule and slows down deliveries of all types of materials and equipment. Such non-optimal logistics affect various phases of any project and even increase labor and material costs since many teams and resources remain inactive.

Example Scenario: In the construction of multi-site construction project, lack of proper coordination may result in wrong location deliveries or wrong time deliveries of materials, costly require redirections, thus delay important activities 5].

Comparison: Direct vs. Indirect Costs

Among the costs that were said to be heavily affected by poor planning, were the direct cost, namely equipment and materials. These categories make up the majority of the cost content and are most closely related to the quality and scope of the planning phase. Still, the costs borne indirectly, say, labor and transportation, while less apparent than direct costs, make up the sense of an additional reinforcement of costs in case of improper planning and subsequent disarray [59].

Overhead costs such as labor and logistics increase over time as adverse effects of delay and rework, whereas material and equipment costs arise directly from wastage or inefficiency thereby directly contributing to the overall cost. This highlights the need for exact early estimation in order to avoid high direct costs and consultancy in order to control for high indirect costs during implementation [59].

The results also indicate that, in need of dealing with poor planning, it should take place during the early phases since the failure to do so results in substantial inflammation of the costs of both direct and indirect resources. Managing resources requires better planning calendar, effective utilization of forecasting, and contingency to cover for any time an activity takes than expected. Also, the action of using information technology in project management improves visibility in the management of resources to reduce duplication or wrong allocation which raises costs.

5.6. Examples of Effective Mitigation Strategies

Below are the following recommendations given by survey respondents, some of which are effective ways of mitigating challenges resulting from poor planning. These include improving informing flow, revising the phase of implementation,

and stepping up field activity. Both approaches are focused on certain problems arising from planning shortcomings and contain useful information on the proper management of the following projects.

TABLE V. EFFECTIVE STRATEGIES TO MITIGATE POOR PLANNING CHALLENGES

Mitigation Strategy	Percentage of Respondents	Purpose	Recommendations
Enhanced Communication	34%	Reduces confusion, enhances communication, and brings collective workforce on the same page.	Organize the workflow using digital tools (Slack, Teams); have frequent check-in/check-outs.
Reorganization of Phases	26%	Postpones activities, rearranges priorities and find a solution to attend to the delay	There is a need to use different forms of scheduling tools such as Primavera P6 or Microsoft Project.
Increased Fieldwork	26%	It allows a strict track and quick issue resolution	Increase field time integrity; implement applications such Procore or BIM 360.
Integrated Risk Management		Allows risks to be flagged at the early stages, thus eliminating time wastage and use of many resources.	Use the concept of ISO 31000 for better risk identification and management.
Structured Training Programs		Strengthens the organisational ability to achieve adaptive and proactive planning.	Provide courses in adaptive planning, and the use of technology-based plans.

These strategies stress such aspects as the timely communication, unstructured working hours, and practical dealing with the consequences of the ineffective planning and present possible ways to enhance the subsequent multiproject management.

Enhanced Communication

Self-developed: 34% of the respondents showed that the enhancement of communication between teams is one of the most important strategies which can help to avoid planning-related issues. Project communication management makes certain that the goals, plans, timeframes and resource needs of all stakeholders, are communicated and understood. It also reduces misunderstandings and helps to bring all the team members in one line in the course of performing the planned actions. Increased communication excellence was more efficient in addressing such multifaceted problems like ill-defined roles and responsibilities, as well as changes in the scope of work since it promotes constant evaluation and resolution of problems.

Recommendation: it is possible to utilize commonly used business messengers such as Slack or Microsoft Teams or, in the case of a specific project, specialized tools such as Asana, so that no one will miss important updates. However, more frequent team meetings and progress reviewing will facilitate higher levels of accountability and enhanced visibility of work within the phases of the project.

Reorganization of Execution Phases

Another often mentioned strategy was the reorganisation of the execution phases, answered by 26% of the respondents. This can be done with the help of re-establishing the project timelines and resources and comes up with priorities to handle the said issues. It was especially helpful in cases of project design which did not consider resource availability or in situations where one encountered hurdle while implementing the plan.

Recommendation: The heads of the projects can easily manipulate phases by using dynamic scheduling tools such as Primavera P6 or Microsoft Project. These tools enable real-time alteration of the project schedule so that the flow of works is not overly rigid or predictable.

Increased Fieldwork

26% of respondents also emphasized the need to increase fieldwork so as to gain better control during the implementation process. .site because this enables project managers and supervisors to spend a lot of time on-site, review what is happening and make corrections where necessary. The practical experience thus provided much benefit not only for project resources management issues or problems with communication.

Recommendation: The theoretical framework should outline an effective structure of an on-site monitoring and evaluation presence for each project team. Furtherly, the use of applications specific to the field like Procore or BIM 360 can improve coordination on the site and decrease the time spent on reports' preparation.

Projects for Future Studies

Based on these findings, the following recommendations can help project managers mitigate planning-related challenges:

- Adopt Integrated Project Management Platforms: Some platforms such as Smartsheet or Monday.com can help to collect data and, therefore, manage projects and make decisions.
- Establish Clear Communication Protocols: Employ specific human interfaces in conjunction with organizational information reporting templates so as to minimize the info void.
- Invest in Training and Development: Provide your teams with the skills for dealing with possible planning problems, including adaptive planning, risk management, or the proper use of technologies.
- Focus on Early Risk Assessment: Situational plans should recognize planning risks by applying tools such as ISO 31000 to come up with early measures of mitigation before planning commences.

5.7. Factors Leading to Poor Planning

As shown in figure 5. 49.1% of respondents indicated that poor communication within the team was the primary reason for ineffective planning. This underscores that almost half of the respondents pinpointed communication issues as the most significant factor impacting planning processes.

Ineffective communication poses a major challenge in the construction sector, especially in projects that involve multiple disciplines and international teams. This can result in increased costs and delays, project failures, and disputes among stakeholders and this is what indicated by Gamil et al., 2019 [61] and Suleiman et al., (2023) [62].

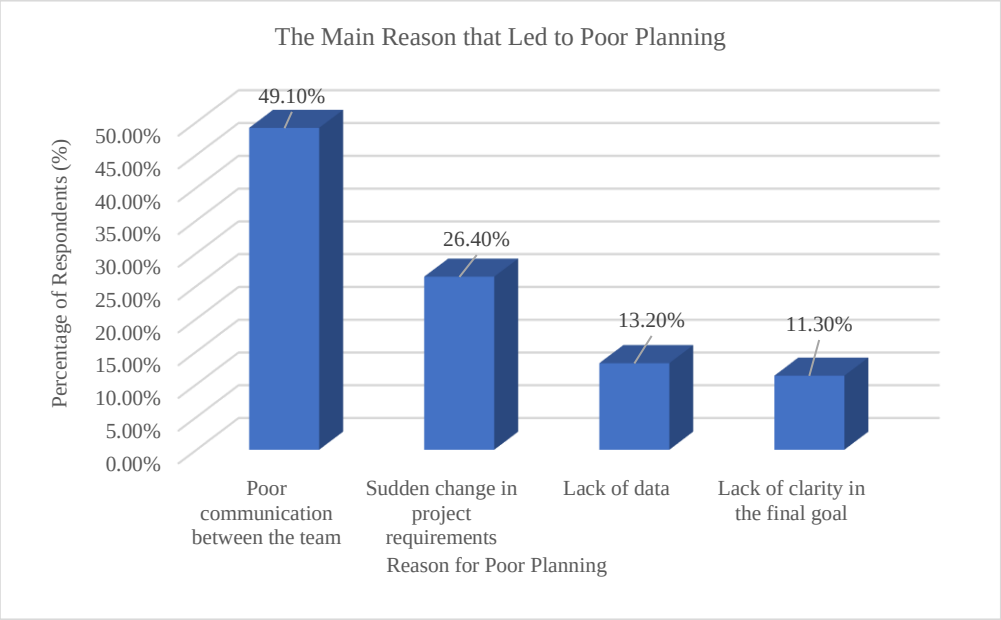

Fig. 5. The Main Reason that Led to Poor Planning

26.4% of respondents pointed to sudden changes in project requirements as a significant factor contributing to poor planning. When the scope or requirements of a project shift unexpectedly, it disrupts the original plans and compels teams to adjust rapidly, which often results in planning shortcomings. This can include changes in goals, timelines, or resources, all of which make planning more complex. This finding highlights the fluid nature of many projects, particularly in fast-paced industries where client needs or external influences require modifications. Research shows that sudden change in project requirements plays a major role in inadequate planning and project failure Shabir, R., (2023) [52].

Mokoena et al., (2023) indicated that in the construction industry, changes in project scope, design alterations, and unforeseen site conditions pose significant challenges to staying within budgeted costs [63].

13.2% of respondents identified a lack of data as a factor contributing to poor planning. When there isn't enough reliable and accurate data, crafting precise plans becomes a challenge. This might involve insufficient market research, incomplete project specifications, or a lack of technical details, which can result in flawed assumptions or estimates during the planning process. It was also indicated by Radman K., (2022) [64].

This result highlights the necessity for better data collection methods and the implementation of data-driven tools that guarantee planning relies on reliable, precise information. Utilizing real-time data via cloud-based systems can further reduce the effects of absent or outdated information.

11.3% of respondents indicated that a lack of clarity regarding the final goal resulted in inadequate planning. When project objectives are not clearly defined or understood by the team, it becomes challenging to develop a cohesive plan. Unclear goals can create confusion, misalignment among stakeholders, and ultimately lead to unsatisfactory project results.

Research shows that vague project objectives can greatly impede project success. A study involving public sector teams in Indonesia discovered that having clear goals positively influences team performance. Likewise, a survey of public project managers in Italy and Poland indicated that there is a lack of understanding of key project elements during the planning phase, especially concerning stakeholders [74]

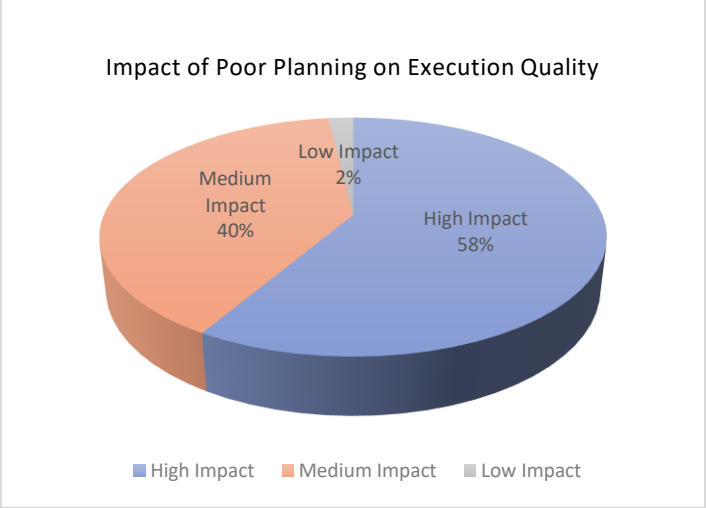

Fig. 6. Impact of Poor Planning on Execution Quality

For the impact of poor planning on execution quality a significant portion of respondents (58%) answered that poor planning greatly affects the quality of project execution. This indicates that insufficient planning can seriously hinder project performance, possibly resulting in delays, increased costs, and diminished quality.

In fields like construction, IT, or manufacturing, where the quality of execution relies on precise planning, inadequate planning can cause a major drop in work efficiency, lead to quality control problems, and result in unmet client expectations. This highlights the importance of detailed project planning that addresses every facet of the project, including scheduling, resource allocation, and risk management. Shabir r. et al (2023) [52] also indicated that Poor planning can result in delays, higher expenses, and a drop in quality.

40% of respondents viewed the effects of inadequate planning as moderate. This suggests that although planning issues can be problematic, certain projects might still achieve a satisfactory level of execution by implementing changes during the execution phase.

In projects where changes in scope or unexpected challenges frequently arise, having contingency plans or agile processes enables teams to adapt without greatly impacting the quality of execution [65].

Based on survey responses some of the main causes of poor planning in engineering and construction projects are as follows: inadequate communication, volatility in project requirements, resource wastage and undefined project goals. All of these factors contribute to project time, cost and success, in what is often a complex interdependence. In this section, each of these challenges is examined in more detail to understand how each of them leads to project delays and increased costs, and the implications on work processes, employee motivation and efficiency.

Poor Communication: Lack of project communication across the team, within the departments and with the stakeholders, was found to be an overlaying reason for complications in planning. Lack of communication creates: Unclear expectations about what needs to be done, when it needs to be done, and who will be doing it Every time there is misunderstanding or lack of clear expectations, it hinders business and leads to costly mistakes. For instance, if the project objectives or updates cannot be effectively communicated to all the stakeholders, implementation may see the different teams working in parallel and hence create even more jobs than were envisaged, take longer time and cost much more than planned [52].

Example Scenario: In a large-scale infrastructure project, lack of proper communication may lead to failure in approving a design phase between the engineering and the procurement departments on the same. Misalignment of these could paralyze the procurement of equipment at the construction phase thus delaying the actual construction phase. Such a disruption often leads to cascading effect where other subsequent tasks are affected hence, extends project time and costs both through extra hours worked by contractors [61].

Other compromises that can be experienced as a result of poor communication include; Logistical: Morale and Productivity: Lacking information or feedback regarding one's contribution and performance at the workplace may lead to perceived job under-embeddedness. This breakdown in morale causes productivity to drop even lower, thus aggravating delays and the standard of the job within environments that mean business, for example construction.

Sudden changes of requirements: Hence, sudden changes of requirements in a project are another aspect that has a negative impact on the planning process. Such changes may occur due to changes in clients' needs, requirements, or regulatory system, adjustments made midway through the project concerning the architectural design of software. However, there is always some flexibility needed, but too many changes in schedules or scope cause significant problems, resulting in schedule slippage and cost increase [52].

Example Scenario: Imagine a situation in a commercial building construction when the client decides in the middle of the constructiveness process to make changes in the building layout, such as new regulation of accessibility. This adjustment

involves redesigning the current design, stopping construction for some time. Apart from the direct design cost, there is the social cost of rescheduling people as well as modifying the requirements for acquiring the necessary materials. Such and similar delays result in having to reshuffle priorities and resources, and such reshuffling takes time as well.
Surge and swell also put immense pressure on productivity and the motivation of human resources. When goals are changed then those members of the team who have been working towards those goals set in place may become frustrated or demotivated. Continual changes to the needs of a project that have not allowed time for updates to the schedule can cause burnout in a team; this reduces the efficiency of the group and adds other potential dangers to the completion of a project [52, 63].
Resource Misallocation: Another major problem associated with inadequate prediction is inefficient resource distribution. Lack of or appropriate resource allocation, be it human, financial or materials, produces a clear recipe for disaster on the part of the project. For example, if the quantity of skilled labor is poorly estimated it leads to critical phases of the project being delayed, and on the other hand exaggeration of the necessary amount of materials is likely to cause tension with the budget. Resource misallocation usually results from the lack of proper scope definition, poor estimations of the required resources at various phase, or the lack of or ineffective budgeting.
Example Scenario: In a residential development project, should the initial plan overlook the requirement of skilled trades persons in the beginning phase of the project, the construction phase may well be in want of expert input; the outcome possibly sub-standard work which leads to a rework cost. On the other hand, improper resource estimation may lead to procurement of excess amounts of material, some of which become obsolete or unusable due to factors such as expiration of its shelf-life or damage due to adverse environmental conditions. This leads to other overhead costs and toughens the ability to manage project budget in other phases of the project [63].
Resource misallocation also ricochets demoralization and decline in productivity. Employees may feel burned out or demoralized if they are the ones that will have to supplement for lack of capacity or effectiveness of resources. Inequality in distribution of these resources can lead to fatigue and addition of more mistakes and in general low-quality output of the project on one hand, while excess of idle materials and equipment on the other can lead to increased expenditure hence having an impact on the project success.
Unclear Project Objectives: Last but not least, ambiguous or lack of clearly stated project objectives result in many planning problems. Lack of clear objectives implies that members may have a different perspective about the goals required on the project, which may result in uncoordinated effort and poor productivity. The main goal of clear objectives is to help the planner in their planning process since everyone should have specific tasks in line with the overall goal of the project.
Example Scenario: Whether a municipal road improvement project is a design-bid-build or integrated form, unclear goals and end quality in terms of durability and costs may create a divergence of practices between the design and the construction teams. If one team targets client resources for getting better quality materials for making a project more durable and other targets getting cheaper resources to cut costs, the project will go out of budget as well as time. They may cause more often changes, alterations, additional time spent, and additional resources to be spent as compared to the ultimate goals of the project since the objectives set do not seem to co-relate with the end products to be used [65].
Lack of clear goals is a major way in which workers can be discouraged, since the targeted projects seem unachievable, or their contributions are not recognized. This is because organizational attention is spread out that can actually dwindle efficiency due to energy and time being exercised on other activities that do not contribute to the prospect of project completion. Insufficient direction hinders decision making also since groups are not in a suitable position to determine the level of importance of the tasks or the right resources to use based on a poor understanding of project hierarchy and priority.

5.8. Risk Management

A majority (58%) of respondents indicated that risk management methods were sometimes used to mitigate the impact of poor planning as shown in figure 7.
This suggests that while risk management practices are present in many projects, they are not consistently applied or fully integrated into the planning and execution process. The irregular use of risk management could result in situations where potential risks aren't identified or addressed until it's too late. Research shows that risk management practices in various industries, including construction and information systems, are often inconsistent and inadequately implemented. Studies conducted in Yemen, Nigeria, and other international contexts reveal that risk management is frequently reactive, informal, and unstructured [66, 67].
From this result, it can be deduced that organizations should adopt a more systematic and frequent application of risk management instruments during/from each phase of the projects' lifecycle rather than in a crisis situation. Adopting such a structure like ISO 31000 or PMI's Risk Management Standards may assist in creating structure to risk evaluation, as proposed by El Khatib et al., (2020) [68]

Fig. 7. Use of Risk Management Methods

A notable 40.4% of respondents indicated that they consistently apply risk management methods. This suggests that many projects understand the significance of risk management and actively utilize these strategies to reduce the impact of inadequate planning. Such projects are probably more resilient and better equipped to address unforeseen challenges during execution.

The same 40.4% of respondents who reported regular use of risk management demonstrate that when these techniques are effectively implemented, they can significantly lessen the consequences of poor planning. These projects likely gain advantages from early identification of potential risks, thorough risk assessments, and the development of contingency plans, all of which contribute to protecting project timelines, budgets, and quality. This underscores the necessity for risk management to be an integral part of the planning process, as it aids teams in navigating uncertainties and steering clear of issues stemming from insufficient planning.

Effective risk management practices involve the use of performance bonds, warranties, and guarantees, along with thorough project documentation and review analysis [69]. Notably, the application of risk management tools tends to decrease as project uncertainty increases, indicating that these tools are more frequently utilized in well-defined situations [70].

Just 2% of respondents said that risk management methods were never employed in their organizations. While several projects do not show any signs of risk management on the Gantt chart, a few of them could prove to be inadequate in terms of preparation to face any challenge or else suffer from poor planning which could have adverse effects on the team.

The questionnaire regarding the impact of poor planning on risk forecasting aimed to evaluate how management engineering professionals perceive the effects of inadequate planning on risk forecasting. The findings reveal that most respondents acknowledge a considerable influence of poor planning on risk forecasting. Specifically:

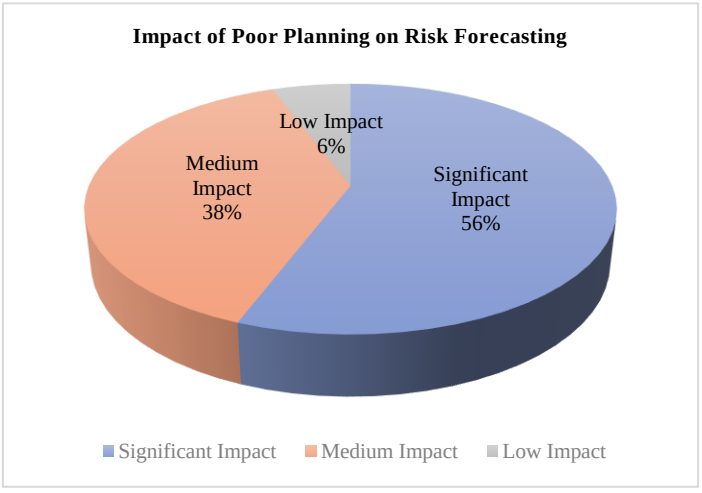

Fig. 8. Impact of Poor Planning on Risk Forecasting

Figure 8. shows that 56% of respondents stated that poor planning significantly impacts risk forecasting. 38% indicated a medium level of impact. The remaining 6% felt that poor planning has a low impact on risk forecasting.
These results imply that over 90% of participants believe that poor planning adversely affects the accuracy and reliability of risk forecasts to a medium or significant extent.
The findings highlight the essential role of planning in effective risk forecasting within management engineering. A notable 56% of respondents believe that inadequate planning results in significant inaccuracies when predicting potential risks. This supports the widely accepted notion that insufficient planning can lead to incomplete data, unforeseen variables, and a higher chance of unexpected disruptions [71].
The 38% who indicated a medium impact may point to scenarios where certain mitigating factors, like adaptive strategies or contingency plans, help reduce the effects of poor planning, though they do not entirely eliminate the risks [72].
The small group of 6% who reported a low impact likely reflects situations where risk forecasting is less reliant on initial planning or where the environment permits some flexibility and resilience despite initial planning flaws.
Poor planning is viewed as a significant factor contributing to ineffective risk forecasting, which can lead to failed projects, budget overruns, or operational inefficiencies in management engineering. Thus, effective planning is crucial for accurate risk forecasting, enabling organizations to better prepare for and address potential risks [51, 73].

5.9. Mitigation Measures

These results illustrate various corrective actions taken by project managers to mitigate risks and challenges stemming from inadequate planning. 34% of respondents noted that enhancing communication between teams was a crucial strategy for lessening the effects of poor planning. 26% indicated that reorganizing the execution phases was a significant step to tackle planning shortcomings. Another 26% emphasized the necessity of increasing fieldwork to better manage issues arising from inadequate planning. Additionally, 13% of respondents mentioned that altering funding sources was utilized as a strategy to alleviate the adverse impacts of planning deficiencies as shown in figure. 9.

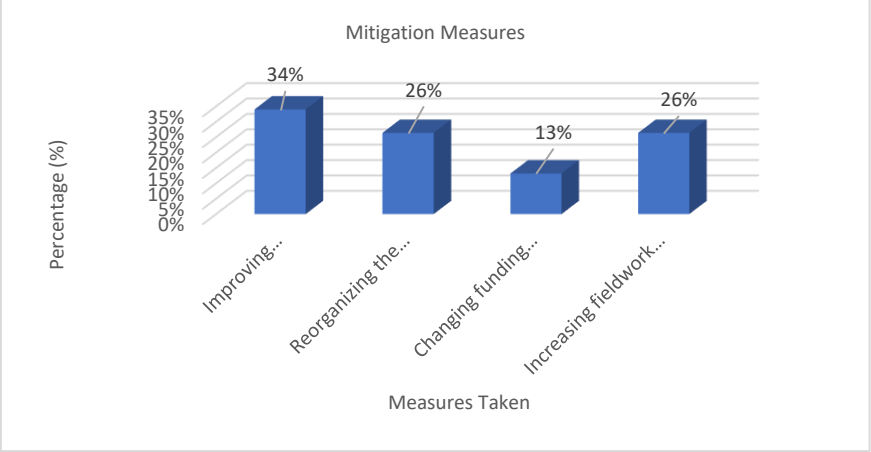

Fig. 9. Mitigation Measures

The findings highlight that the most commonly employed measure to reduce the impact of poor planning is improving communication between teams (34%). This suggests that clear and open lines of communication are perceived as essential for aligning teams and ensuring that planning flaws are identified and addressed more effectively. By fostering better collaboration, project teams can mitigate risks and adapt to unforeseen issues more efficiently.
Reorganizing the execution phases and increasing fieldwork, each selected by 26.4% of respondents, are also significant measures. Reorganizing phases likely allows project teams to re-evaluate timelines, re-allocate resources, and optimize workflows, providing greater flexibility to adapt to the issues caused by insufficient planning. Increasing fieldwork shows a hands-on approach to solving problems, giving management more direct control and oversight over project activities.
The smaller percentage (13.2%) that identified changing funding sources as a measure could indicate that this is a less commonly used but potentially impactful strategy. Shifting funding sources may be seen as a way to secure more resources or mitigate financial risks arising from the effects of poor planning. However, this approach may be less frequently utilized because it can be more complex or less feasible, depending on the project's financial structure.
Research emphasizes the vital importance of effective communication for the success of projects, especially in the construction and engineering fields. Ineffective communication and inadequate planning are recognized as significant obstacles in project management [73]. Research indicates that the adoption of communication planning has a notable effect on project performance, with 78.02% of professionals surveyed affirming its use [74].
Project management relies heavily on communication, reorganization, and increased field oversight as primary methods for dealing with the challenges of poor planning, with funding changes being a secondary consideration [75]. These

strategies collectively demonstrate a balance between adjusting operational workflows and reinforcing communication and control mechanisms. This structure organizes the data clearly in the results section and provides a deeper analysis of the strategies in the discussion section.

5.10. Final Evaluation

The results in figure 10. indicate that a large majority of respondents view poor planning as having a significant negative effect on project outcomes. The feedback shows a strong agreement that inadequate planning greatly impacts project success

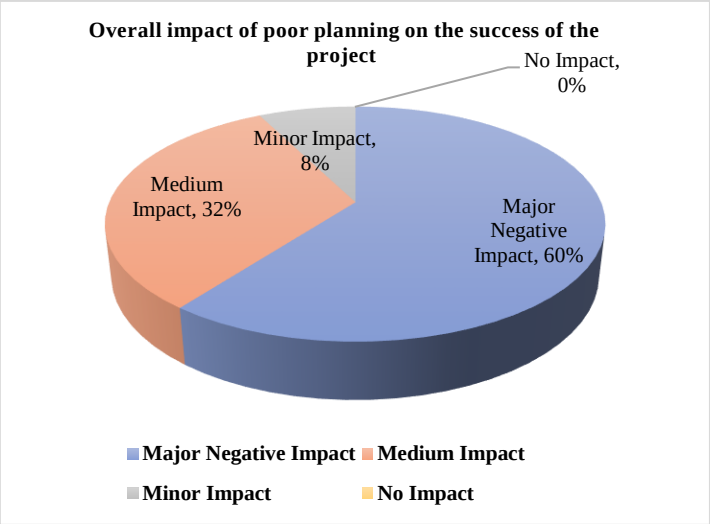

Fig. 10. Overall Impact of Poor Planning on The Success of The Project

60% of respondents feel that poor planning has a major negative impact on project success. 32% rated the impact as medium. The remaining 8% believe that poor planning has a minor effect. Interestingly, 0% of respondents claimed that poor planning has no effect on project success.

The results clearly show that inadequate planning is viewed as a significant factor in project success, with 60% of respondents indicating it has a major negative effect. This highlights the common understanding that the success of projects heavily relies on effective and comprehensive planning. Insufficient planning can result in various issues, such as delays, budget overruns, and failure to achieve project objectives, which may account for the high percentage of respondents acknowledging its serious negative impact [76].

The 32% who indicated a medium impact might represent scenarios where specific strategies, like adaptive management or responsive leadership, can lessen the severity of the effects caused by inadequate planning. Nevertheless, even in these instances, the repercussions of planning shortcomings remain significant and probably necessitate considerable changes throughout the project lifecycle [77].

Only 8% of respondents noted that poor planning has a minor impact, indicating that some projects might be robust enough to handle initial planning deficiencies. This resilience could stem from having adaptable frameworks or effective risk management strategies that can address shortcomings during the planning stage [78].

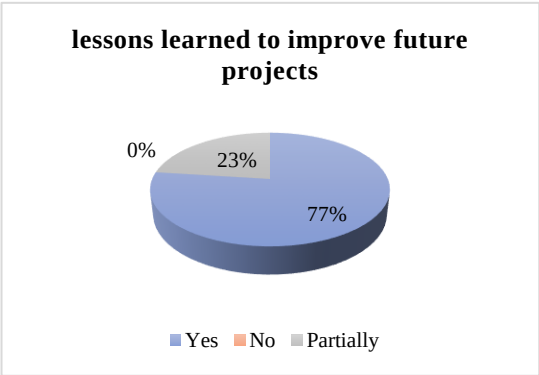

Fig. 11. lessons learned to improve future projects

The questionnaire explored whether lessons from current projects could be applied to improve future ones. The feedback on figure 11. shows a strong focus on learning from past experiences, though some participants felt that only some lessons were fully grasped. The responses are as follows: 77% of respondents answered Yes, indicating that they fully learned lessons to enhance future projects. 23% responded with Partially, suggesting that while some lessons were learned, there are still areas needing improvement. 0% of respondents chose No, meaning all participants felt some level of learning took place from the projects. These findings highlight that the vast majority of respondents believe valuable insights were gained to positively impact future project planning and execution.

While many respondents believe that the lessons learned are leading to improvements, there remains an opportunity to enhance the processes that capture and apply these lessons. It is essential to review all facets of the project and integrate these lessons into future planning to promote continuous success in management engineering projects [79].

6. CONCLUSION

Lack of proper planning is shown to have worse consequences for both project time and cost in engineering projects presented in this study due to poor preparation. The key issues are actually identified to have been in the wrong planning of many phases of the project such as resource acquisition phase, the timeline phase and the risk control phase that has been strongly seen to bring about such unfavorable results. In the survey, major findings show that 66% of the respondents had delays above 10% and 20.8% of delays above 30%. Similar was the case with the costs: 44.2% of participants noted that costs were increased within 10-20%, further 32.7% respondents noted more than 30% increase.

Previous year cost increase was more significant in equipment and materials, which are cost categories that should be improved in forecasting and cost containment. Moreover, lack of communication within project teams and changes in project requirements were also cited as the main sources of planning problems at more than 75% of the projects surveyed. The application of solutions to these challenges has entailed enhancing team cooperation (34%), redesigned the execution stages (26%), and enhanced fieldwork (26%) to solve challenges rapidly. Nevertheless, the respondents pointed that risk management practices were laissez faire in terms of sophistry and standard, let alone the fact that they compounded the effects of planning deficits on the results of the projects.

In conclusion, this research brings out the lessons that should always be taken by project managers about the importance of going to a depth, extremes, extent, and beyond whenever they are planning on the various projects that they are undertaking. Evaluating from the current project challenges in relation to enhancing the future planning shows that, 77% of the participants supported that useful experience was learned for improving future projects. Applying constant planning frameworks and enabling the identification of risks at the outset might minimize future adverse effects of ineffective planning on the project schedule and expense.

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