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A Study on Factors Affecting Time, Cost and Quality in Construction Project

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Abstract: ***The main aim of this study is to evaluate and analyze the management of time, cost, and quality in the construction sector. The study seeks to identify the factors impacting these aspects in construction projects. Quality is highlighted as a critical component of all projects, and the success of construction endeavors heavily relies on its performance. However, achieving this goal is undeniably challenging. This research specifically focuses on the factors affecting cost and time control in construction projects. The objective is to propose recommendations that can aid stakeholders in achieving improved cost and time performance in construction projects. The study acknowledges the complex nature of balancing these essential elements and aims to provide valuable insights for enhancing overall project outcomes in the construction industry. This study is confined to the viewpoint of a suitable sample of professionals within the construction industry. The data collection method comprises questionnaires and interviews, which will undergo descriptive statistical analysis utilizing percentages, mean scores, and the frequency of collected data. The main factors influencing time, cost, and quality in construction projects were identified as planned and scheduled deficiencies, fraudulent practices, kickbacks, and the absence of clear evaluation standards. The research aims to scrutinize factors with both positive and adverse effects on construction projects. It suggests that construction teams should work diligently to ensure effective management of time, cost, and quality in construction projects. The objective of this study is to analyze the perceptions of project team members regarding time, cost, and quality management in construction projects. Conclusions are drawn, and recommendations are provided concerning estimates for time, cost, and quality management in construction projects.***

Keywords: effective management, questionnaires, interviews.

I. OBJECTIVES TO STUDY

1) *Identification of Factors:* The primary goal is to identify the various factors that impact the time, cost, and quality of construction projects comprehensively.
2) *Analysis and Study:* Subsequently, a detailed analysis and study will be conducted to delve into these factors and their effects on project timelines, expenditures, and the overall quality of workmanship.
3) *Case Study Selection:* The study also intends to identify suitable projects for in-depth case studies, which will serve as practical examples to illustrate how these factors manifest in real-world construction scenarios.
4) *Questionnaire Development:* A crucial aspect of the research involves the preparation of meticulously crafted questionnaires designed to gather insights from relevant stakeholders in the construction industry, including project managers, contractors, and other key personnel.
5) *Data Analysis:* Following the administration of the questionnaires, the collected data will undergo rigorous analysis to extract meaningful patterns and correlations, shedding light on the relationships between various factors and their impact on project outcomes.

A. Factors Affecting On Time

Inadequate construction planning can result in delays, disruptions, and even the cessation of construction activities. When construction plans lack thorough consideration, unforeseen challenges may emerge during execution, leading to setbacks, interruptions, and potential project standstills. Poor communication exacerbates these issues, fostering project failures due to breakdowns between project owners, teams, and stakeholders.

Equipment breakdowns further compound delays, directly impacting project completion timelines. Persistent labor shortages have plagued the construction industry in recent years, impeding companies from filling essential positions and jeopardizing project schedules.

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Effective communication during construction projects significantly influences retention rates and project performance, as evidenced by scenarios depicted by construction workers at industry forums. Design changes, while sometimes necessary for improving project quality, functionality, or aesthetics, also pose risks of indirect costs, claims, and disputes. Critical design alterations may trigger successive delays, necessitating revised drawings to inform on-site personnel promptly.

While design changes during construction are often unavoidable, they must be managed carefully to mitigate associated risks. Despite their potential benefits, these modifications can escalate project timelines, expenses, and team conflicts.

Slow decision-making processes in construction have detrimental effects on project performance, particularly when clients' decisions are delayed, impeding contractors' progress and potentially leading to increased claims for additional time and costs. Inadequate coordination and management at project sites exacerbate decision-making delays. Furthermore, poor communication among project participants poses significant risks to large-scale infrastructure projects, emphasizing the necessity for efficient coordination efforts among stakeholders.

A pressing issue in the construction industry is the dearth of capable leadership capable of making prompt decisions during large-scale infrastructure projects. Delays in work approval, particularly in submittal approval, can prolong project completion dates, incurring additional costs and causing frustration among stakeholders. Poor communication practices within the industry exacerbate project delays, manifesting as delays in information flow, misdirected communication, and unclear communication leading to confusion.

Design changes are another significant contributor to construction project delays, necessitating careful assessment of their impact and effective communication with stakeholders to ensure project continuity. Regular construction site inspections are crucial for ensuring compliance with project plans, specifications, client requirements, and code regulations. These inspections, facilitated by construction management software, are vital for quality control, worker safety, and productivity. Delays in inspection processes can result in cost overruns, legal disputes, financial losses, contract failures, disputes, arbitration, litigation, project abandonment, and impossibility.

The complexity of projects is also a major contributing factor to delays and cost overruns in the construction industry.

Complexity in construction projects can be delineated by their scale, with mega projects like dams, motorways, skyscrapers, and nuclear power stations often requiring extended implementation durations compared to smaller endeavors such as residential houses or non-commercial buildings. This discrepancy in duration can trigger fluctuations in material prices, exchange rates, and inflation rates, necessitating supplementary budgets to ensure project completion. Consequently, increased costs and prolonged negotiations ensue, leading to overall project delays.

Moreover, projects characterized by high complexity typically entail intricate plans, schedules, and estimations. Failure to adequately address these complexities may result in variation orders, further exacerbating time delays and cost overruns. Additionally, managing project quality becomes challenging due to the involvement of diverse stakeholders with varying interests and protracted communication chains, leading to sluggish feedback loops.

In summary, the scale and complexity of construction projects, along with the associated fluctuations in material prices and exchange rates, can precipitate budgetary supplements and prolonged negotiation processes, ultimately leading to delays and increased costs. Furthermore, intricate project plans and diverse stakeholder interests exacerbate these challenges, underscoring the importance of proactive management strategies to mitigate potential disruptions.

Before commencing any project, the Employer typically conducts a thorough assessment to determine the initial investment required, relying heavily on an Engineer's estimate. This estimate serves as the foundation for all subsequent economic calculations and benefits analysis, underscoring the need for realistic cost figures. To generate an accurate Engineer estimate, a comprehensive approach is essential, involving detailed investigative studies, extensive design expertise, clear scope delineation, precise quantity calculations, and meticulous planning.

Inaccuracies or errors in estimation can lead to cost overruns, subsequently causing delays in project timelines. Achieving accuracy in engineering estimation necessitates proactive engagement with all project stakeholders to gather pertinent information. Effective communication with design teams and clients further enhances the accuracy of engineering estimates.

Material and equipment management play pivotal roles during project execution, representing significant cost outlays. Materials alone typically account for 60% to 70% of the direct costs in construction projects. Therefore, minimizing procurement or rental costs can significantly impact overall project costs. A robust materials and equipment management system ensures the selection, procurement, transportation, delivery, and handling of materials and equipment on-site are conducted efficiently, timely, and at reasonable costs.

Poor management practices can result in substantial and avoidable costs, as well as delays in critical work completion due to material and equipment unavailability. Effective construction management prioritizes the efficient utilization of materials and equipment. Material and equipment handling, encompassing procurement, inventory management, fabrication, and field servicing, requires meticulous attention to detail to streamline processes, save time, and reduce costs.

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B. Factors Affecting On Cost

Corrupt practices and kickbacks pose significant threats to the integrity of construction projects. The total construction cost encompasses all expenses related to building the structure, including material costs, labor expenses, and overhead. Similarly, the total square footage represents the overall area of the structure, covering both interior and exterior dimensions. Often, many contracts are overlooked until their renewal, which can result in substantial financial losses for businesses, estimated at around 9% of total income, according to research conducted by the International Association for Contract and Commercial Management.

Research indicates that between 10% and 25% of project costs are lost due to errors, including both direct and indirect costs. The impact of forecast errors on a company's finances can be significant, but minimizing errors can lead to substantial savings, such as reduced inventory, production costs, and avoidance of stock-outs.

There are five primary types of construction cost estimates: preliminary, detailed, quantity, bid, and control, each serving distinct purposes at different project lifecycle stages. These estimates involve analyzing tasks, duration, and required resources, along with anticipating associated costs.

The choice of procurement method significantly influences construction project costs. Various procurement methods exist, including the Traditional Method, Management Contracting, Design and Build, and Joint Partnership or Venture. Each method carries its own set of risks and benefits, and selecting the appropriate method can be a challenging decision, even for seasoned industry professionals.

When material prices experience a significant increase, such as a 15-fold rise, it profoundly impacts construction project costs. This surge in material costs, whether it's steel, concrete, lumber, or others, directly inflates overall project expenses. The escalation doesn't just affect material procurement; it also drives up labor costs due to the need for specialized handling or construction techniques with pricier materials. Furthermore, subcontractor pricing may also be influenced, exacerbating the cost escalation. To counteract these impacts, construction projects may need to reassess budgets, explore alternative materials, negotiate pricing with suppliers, or seek cost-sharing arrangements with clients.

Efficient project management in construction entails optimizing the use of labor, materials, and equipment. Continuous improvement in labor productivity is essential for effective cost control in construction projects. Material handling, including procurement, inventory management, fabrication, and field servicing, requires focused attention to reduce costs. The integration of new equipment and innovative methods has brought about significant changes in construction technologies. Failure to embrace these innovations and adapt to evolving environments has led some organizations to lose relevance in construction activities.

Payment issues within construction projects can significantly affect overall costs. Delays in receiving payments from clients or stakeholders disrupt project cash flow, leading to increased financing costs, potential delays in material procurement or services, and strained relationships with suppliers and subcontractors, potentially resulting in additional expenses. Disputes over invoices or change orders can further delay payments, resulting in legal fees, extended project timelines, and potential rework due to disputes, all contributing to higher costs. Poor financial planning by any involved party can lead to cash flow shortages, increased financing costs, potential project delays, and strained relationships due to financial instability, ultimately impacting overall project costs.

C. Factors Affecting On Quality

The study concludes that significant factors impacting time, cost, and quality in construction projects include deficiencies in planning and scheduling, fraudulent practices, kickbacks, and the absence of clear, uniform evaluation standards. Chronic issues in the construction industry, such as fragmentation, low productivity, time and cost overruns, poor safety standards, substandard working conditions, and insufficient quality, contribute to project failures and tarnished construction reputations.

Quality defects in construction are commonly observed, including roof cracks, plumbing leaks, and faulty electrical systems. These stem from various sources such as the use of low-quality materials, inadequate auditing, lack of proper supervision, and design complexity.

The absence of standardized evaluation criteria can lead to subjective assessments of construction quality, resulting in disagreements among stakeholders. Different interpretations of quality standards may lead to divergent construction approaches, undermining the consistency and uniformity of built structures.

Clear and uniform quality standards serve as benchmarks for evaluating construction quality, promoting consistency and comparability. Inadequate control processes, including poor project management, communication breakdowns, insufficient supervision, unskilled labor, inferior materials, and deviations from approved plans, can compromise construction quality. Rigorous control measures and regular inspections are necessary to address these issues and ensure project success.

Communication breakdowns among project stakeholders, including contractors, subcontractors, and suppliers, can lead to errors and omissions. Unclear control processes may hinder effective change management, making it challenging to assess and control changes to the project scope. Therefore, establishing clear communication channels and protocols is vital to avoid misunderstandings and misinterpretations in project requirements.

Insufficient documentation, review, and approval processes for changes in construction projects can introduce errors and diminish the quality of final deliverables. Furthermore, unclear control processes can impede effective risk identification, assessment, and mitigation strategies, potentially leading to unforeseen challenges that compromise project quality. Such unclear processes may also contribute to schedule delays, further impacting project timelines. The pressure to meet deadlines can result in rushed construction activities, compromising workmanship quality.

Effective coordination among various stakeholders is paramount for ensuring construction project quality. Poor coordination often leads to communication gaps between architects, engineers, contractors, and subcontractors, fostering misunderstandings, errors, and delays. Inefficient scheduling and sequencing of activities due to a lack of coordination can cause delays in one part of the project, cascading into subsequent tasks and potentially compromising overall quality. To mitigate the adverse effects of poor coordination, it is essential to establish clear communication channels, utilize collaborative project management tools, promote teamwork, and regularly review and update project plans.

Problems in material management can also significantly impact construction project quality. Uncertain material availability, improper storage, and inadequate handling can result in delays, rework, and compromised quality. Implementing efficient material management processes, such as proper procurement, inventory management, and quality control, is crucial for maintaining project quality standards.

Effective management of materials is essential to ensure their availability at the right time, quantity, and quality standards. Failure to plan and track materials adequately can result in shortages, causing delays and disruptions in construction activities. Shortages may compel the use of substandard alternatives, compromising project quality. Insufficient documentation and control of materials may result in the use of incorrect or non-compliant materials, jeopardizing structural integrity and safety.

Ineffective material management may lead to the procurement of low-quality or counterfeit materials, which can cause premature deterioration and reduced durability, undermining construction quality. Improper storage and handling of materials on-site can result in damage or degradation, further compromising quality. Weather exposure, contamination, or mishandling can affect materials before incorporation into construction, leading to extensive quality problems.

Issues such as improper concrete mixtures, poorly graded steel, and undersized lumber can pose safety hazards and compromise construction quality. Faults during construction, if not identified and rectified promptly, can lead to structural issues, safety concerns, and compromised overall project quality. Inadequate skills or negligence among construction workers can result in poor workmanship, including improper installation, inaccurate measurements, and sloppy finishes. Lack of supervision and oversight during construction may contribute to errors as workers deviate from approved plans and specifications.

Moreover, the use of incorrect or defective materials during construction can lead to faults, further compromising project quality. It is imperative to source materials from reputable suppliers to mitigate risks associated with faulty materials.

Mismatched materials, such as inaccurate concrete mixtures or faulty structural components, pose a threat to the durability and performance of construction projects. Despite some construction companies rigorously adhering to third-party auditing and testing plans, they often overlook critical results, proceeding with flawed designs and quality issues. Establishing a designated role for quality control is imperative to address these concerns, ensuring proper oversight of audit and test reports to prevent the oversight of critical quality issues. Non-compliance with contract terms in construction projects can significantly impact project quality. Contracts serve as legally binding agreements delineating expectations, responsibilities, and terms for all parties involved. Deviations from contract terms, particularly concerning financial aspects, may lead to budget overruns, prompting compromises on material quality or workmanship. To mitigate the effects of non-compliance, it is essential to establish clear and comprehensive contracts, foster open communication, and monitor adherence to contractual obligations. Effective contract management, documentation, and dispute resolution mechanisms are vital to delivering projects with expected quality, within budget, and on schedule. Inefficient communication in construction projects profoundly affects overall project quality. Effective communication is essential for coordinating stakeholders, ensuring comprehension of project requirements, and addressing issues promptly. Ineffective communication can result in misunderstandings and misinterpretations of project specifications, leading to errors and rework. Poor communication between design and construction teams may cause discrepancies between the intended design and the executed construction, compromising the final built structure's quality. Therefore, fostering efficient communication channels and protocols is critical to ensuring project success and quality.

Delays in disseminating crucial information among project stakeholders can result in postponed decision-making processes. Late decisions have the potential to disrupt the project schedule, consequently leading to rushed activities that may compromise the quality of work. Inefficient communication may also contribute to delays or errors in material procurement and delivery, ultimately leading to material shortages or the utilization of incorrect materials, thereby jeopardizing the quality of construction.

Poor communication practices can induce confusion, unnecessary delays, budget or cost overruns, safety hazards, and stakeholder issues. These communication challenges can adversely impact daily progress reports and overall project performance. Therefore, fostering effective communication channels and practices is imperative to mitigate these risks and ensure the successful execution of construction projects.

II. LITERATURE REVIEW

A. International Journal of Creative Research by Henry, Jackson and Bengt-

Various researchers have identified a plethora of factors influencing project duration (time) across different construction industries. Among the most significant challenges are material shortages, incomplete drawings, inadequate supervision, lack of tools and equipment, absenteeism, communication gaps, subpar site layout, inspection delays, and rework. Cost and time control, the process of managing a construction project's expenses and schedule, is paramount for ensuring project completion within budget and schedule constraints, without disrupting stakeholders. This control mechanism involves continuously monitoring actual costs and time performance against initial estimates, identifying any deviations, and implementing corrective measures to address issues and optimize performance.

Construction cost and time control significantly impact project cost and quality. Project managers encounter numerous challenges in executing this process, notably managing project schedules and ensuring adherence to budgetary constraints. Cost overruns, a prevalent issue in construction projects, occur when actual project costs surpass initial estimates, putting pressure on investments and project completion. The cost limit represents the maximum expenditure the client is willing to allocate to the project, while the target cost denotes the recommended expenditures for specific project aspects.

Construction projects frequently exceed estimated costs due to suboptimal cost and time management practices, a problem observed globally across developed and developing countries. Enhancing the cost and time control process is imperative to ensure projects are completed within budgetary and scheduling constraints. By addressing these challenges and optimizing cost and time management practices, construction projects can achieve greater efficiency and success.

B. Evaluation of Factors Affecting the Quality of Construction Project by Olomolaiye, Jayawardane and Harns-

In the Nigerian construction industry, several significant factors influence time management. These include material shortages, rework, equipment availability, delays in supervision, absenteeism, and interface issues. Time overrun, a common occurrence in construction projects, occurs when a portion of the project is completed later than the initially agreed-upon completion date or not as planned due to unforeseen circumstances. These delays, often referred to simply as delays, are events that extend the time required to finish all or part of a project.

Cost overrun, on the other hand, signifies the actual cost exceeding the budgeted amount. Terms such as "cost increase" or "budget overrun" are used interchangeably to denote cost overruns. The calculation of cost overrun involves determining the disparity between the original cost estimate and the actual construction cost upon project completion. These phenomena are ubiquitous in construction projects and can significantly impact project outcomes if not managed effectively.

C. Factors Affecting Overruns Construction Time and Cost by Henry, M. A., Jackson, A.M. and Bengt, H.-

Numerous factors contribute to the quality of construction, including but not limited to, material shortages, adverse weather conditions, site limitations, inadequate tools and equipment, design inaccuracies, change orders, delays in inspections, absenteeism, safety concerns, and poor planning. Understanding and analyzing these factors are imperative for enhancing the quality of construction work, products, and services. Conducting a questionnaire-based survey can be instrumental in assessing the impact of each factor on overall quality management.

By comprehensively considering these factors during the construction process, stakeholders can forecast the project's performance level before commencement, thus facilitating the attainment of desired quality standards and ensuring project success. Recognizing the significance of these elements in construction is essential for implementing effective quality management systems and elevating the overall.

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D. Factors Affecting Cost and Time Control in Construction Project by T. Senthil Vadivel (2011)-

Efficient cost management plays a pivotal role in the triumph of construction projects, being a fundamental determinant of their performance. Extensive examination of existing literature has pinpointed numerous factors exerting influence on cost management within construction endeavors. These encompass deficiencies in defining project scope, inaccuracies in estimating activity costs, inadequacies in delineating work breakdown structures, alterations in project schedules, imposition of impractical timeframes stipulated in contracts, sporadic updates to project budgets, insufficiencies in the training and expertise of project managers, and neglect in the utilization of project management tools like Primavera and other software solutions. These findings underscore the criticality of addressing these factors to optimize cost management practices in construction projects.

E. Factors Affecting Time, Cost and Quality Management in Building Construction Project by M. Doddurani-

Various researchers have delineated an array of factors influencing project timelines across diverse construction sectors. Predominant challenges impacting project duration encompass shortages of materials, incomplete drawings, substandard supervision, inadequate tools and equipment, absenteeism, communication lapses, deficient site layouts, inspection delays, and rework occurrences. Additionally, an examination of cost and schedule vulnerabilities associated with the establishment of 20 low-income housing units in Tripoli, Libya, is expounded upon in the text. This analysis entails Monte Carlo simulations to assess pre- and post-mitigation scenarios in comparison to the original plan, revealing a distribution of risks comprising 55% low risk, 25% moderate risk, and 20% high risk. Furthermore, a Failure Mode and Impact Analysis conducted within a case study in China identifies five unacceptable hazards, including incidents such as "hole in the ground at construction site," "collision with falling objects," "running through operating equipment," "elevator shaft falls," and "scaffolding falls." Recommendations are proffered to enhance Occupational Health and Safety (OHS), environmental, and quality measures to instigate comprehensive risk management practices. It is emphasized that risks do not manifest linearly, necessitating alternative tools to comprehend their interconnections. To map the risk landscape effectively, organizations are encouraged to simulate diverse accident scenarios and employ tools addressing risk interdependencies. The study aims to ascertain the cumulative impact of risks on project performance and value, facilitating the selection of an optimal blend between risk retention and treatment strategies. Proposing an agent-based model termed SMACC, the paper endeavors to evaluate loss repercussions on a project and evaluate various risk mitigation approaches to gauge their efficacy. The text underscores the indispensability of effective risk management for project prosperity, albeit acknowledging the complexity engendered by the multifaceted and dynamic nature of risks. Each project is posited to harbor its unique set of risks, necessitating tailored focus and actions. Additionally, the study canvasses an extensive spectrum of domains encompassing external risk management, finance, politics, and national cultures, with an abundance of literature in each sphere accentuating the significance of risk management. Although external risk management stands as a pivotal success determinant for construction entities venturing beyond their domestic realms, it is often disregarded by firms lacking adequate acumen in external risk management or failing to recognize its ramifications on their operations.

III. DATA ANALYSIS

We conducted site visits to a total of 20 locations. Table 1 provides an analysis of the respondent categories. The findings reveal that contractors represent the largest cohort, comprising 20 respondents, while design engineers constitute the smallest group, with 12 respondents. Table 2 presents the years of work experience among the respondents. On average, respondents reported 11 years of work experience, suggesting a high level of competence in furnishing the study with reliable and contemporary data. Moreover, the average involvement in 10 projects per respondent indicates a substantial level of experience, enabling them to offer the requisite accurate and updated information vital for the study's objectives.

Professional	Frequency	Percentage
Architect	15	32%
Contractors	20	43%
Design Engineer	12	25%
Total	47	100%

Table 1 Analysis of the Respondent Categories

Year	Frequency
1-5	10
6-10	9
11-15	17
16-20	5
Above 20	6
Total	47

Table 2 Respondent Professional / Personality

During our extensive visits to contractors, architects, and builders, our primary objective was to assess the factors influencing time, quality, and cost in construction projects. Engaging in discussions with key personnel and scrutinizing pertinent documents allowed us to delve into the project management methodologies employed by these stakeholders. Individuals such as Mr. Mayuresh Patil, Mr. Ganesh Sawant, Mr. Dhondiram Dalavi, Mr. Harish Kukreja, and Mr. Kamlendra Ravi showcased a systematic approach to time management, prioritizing adherence to project schedules and proactive resolution of issues to mitigate potential delays. Their unwavering commitment to quality control was palpable, characterized by a steadfast dedication to using premium materials and upholding industry standards. Additionally, a keen focus on cost management was observed, with robust strategies in place for budget planning and diligent monitoring of expenses. Upon thorough assessment, we have assigned an overall rating to contractors, architects, and builders. This evaluation process provided invaluable insights into their project management practices, underscoring their dedication to delivering projects punctually, maintaining high-quality workmanship, and implementing cost-effective solutions. We recommend exploring further collaborations with these entities, contingent upon their ongoing adherence to these principles. The Relative Importance Index (RII) serves as a metric to gauge the significance of each factor in the perceptions of respondents. Calculated as the mean score for an item, the RII aids in ranking indicators accordingly, providing valuable insights into stakeholders' perspectives.

The Relative Importance Index (RII) formula, denoted as $RII = \Sigma W/(A*N)$, serves as a crucial metric for assessing the significance of factors contributing to delays in construction projects. In this formula:

1) W represents the weighting assigned to each factor by the respondents, reflecting their perceived importance
2) A signifies the highest weight among all factors considered
3) N denotes the total number of respondents included in the sample. A higher RII value indicates a greater importance attributed to a particular factor as a cause of delays in construction projects. Through the application of the RII formula, researchers can effectively evaluate and prioritize factors influencing project delays based on input from respondents. This quantitative approach facilitates the identification of critical areas requiring attention and intervention to enhance project efficiency and timeliness.

A. *Ranking Of Factors Affecting Time In Various Construction Project*

FACTORS	∑N	RII	Rank
1.Shortage of Labour	94	0.94	1
2. construction material shortage	90	0.9	2
3. Inadequate drawings	74	0.74	3
4.Deficiencies in Planning and scheduling	70	0.7	4
5.Delays in delivery	70	0.7	5
6.Inadequate number of equipment	68	0.68	6
7.Organizational Deficiencies	66	0.66	7
8.Slow Decision Making	64	0.64	8
9. Delays in work approval	56	0.56	9
10.Design changes	56	0.56	10
11.Issues with neighbors	52	0.52	11
12 Delays in acquiring information	46	0.46	12
13.Delays in inspection and examination of work	34	0.34	13

Table 3. Ranking of Time Factors

B. Ranking Of Factors Affecting Cost In Various Construction Projects

FACTORS	∑N	RII	RANK
1. Payment issues	86	0.86	1
2. Financing and payment of completed work	84	0.84	2
3.Errors in cost estimates	74	0.74	3
4. Deceitful practice & kickbacks	72	0.72	4
5.Errors and discrepancies in contract document	72	0.72	5
6.Increase in material prices	72	0.72	6
7.Relationship between labour and management	72	0.72	7
8.Lack of availability of Materials	68	0.68	8
9.Design variations	64	0.64	9
10.Inefficient contract management	62	0.62	10
11.Changesin site conditions	60	0.60	11
12.Construction methods	48	0.48	12
13.Weathe rchanges	30	0.30	13

Table 4 Ranking of COST

C. Ranking Of Factors Affecting Quality In Various Construction Projects

FACTORS	∑N	RII	RANK
1.Unavailability of Technical Staff	42	0.42	1
2.Inadequate drawings	37	0.37	2
3.Inefficient communication	36	0.36	3
4.The designer' sign	35	0.35	4
5.Problem in Material Management	34	0.34	5
6. Lack of Co-ordination	33	0.33	6
7. Unclear Control Process	32	0.32	7
8.Non-Compliance with the term of The Contract	28	0.28	8
9.Limitedsite	27	0.27	9
10.Unforeseen geological conditions	27	0.27	10
11.Absence of Clear Uniform Evaluation Standard	26	0.26	11
12.Weatherconditions	26	0.26	12
13.Regularequipment breakdowns	25	0.25	13
14. Fault during Construction	24	0.24	14

Table 5 Ranking of Quality Factors

IV. CONCLUSION

In summary, a myriad of factors exert substantial influence on the time, cost, and quality aspects of construction projects. Through an in-depth examination of these factors, we have gained valuable insights into their impact on construction activities. By meticulously evaluating and rating these factors, we have identified key determinants affecting project timelines, quality standards, and financial expenditures.

From external forces such as economic fluctuations and regulatory frameworks to internal dynamics like project management efficacy and resource utilization, a holistic comprehension of these factors is paramount for achieving favorable project outcomes. By proactively addressing these factors, stakeholders can optimize project performance, streamline operations, and mitigate potential risks, thereby ensuring the prompt delivery of construction projects of superior quality within budgetary constraints.

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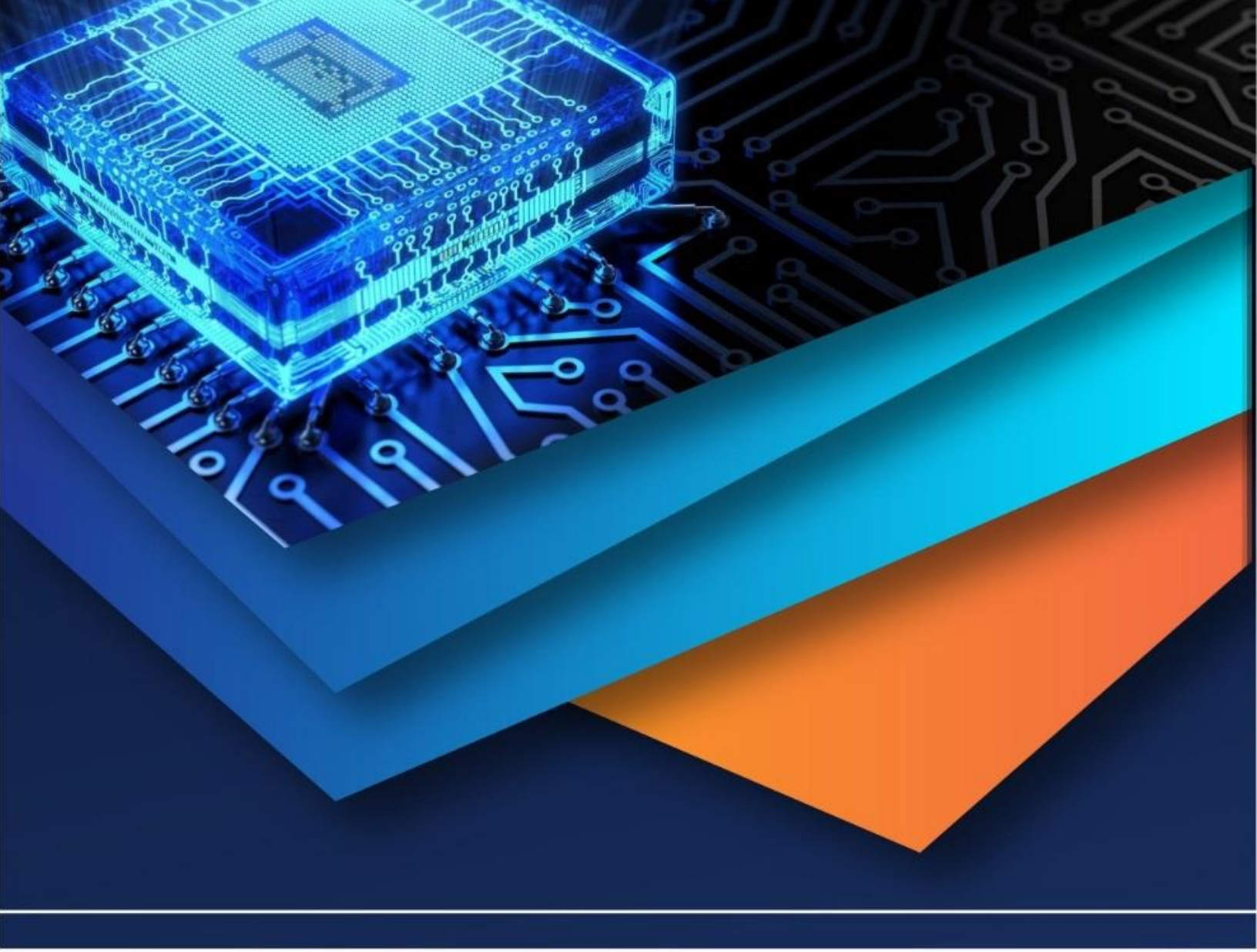
Our study underscores the significance of addressing major challenges such as planning and scheduling deficiencies, unethical practices, and the absence of standardized evaluation criteria. Moreover, we highlight the detrimental consequences of non-compliance with time, cost, and quality management protocols, as evidenced by incidents of building collapses in the construction industry. Such occurrences not only incur substantial costs but also undermine public trust in the industry, posing significant challenges to its credibility and sustainability.

In conclusion, our research reaffirms the imperative of robust time, cost, and quality management practices in the construction sector. Through concerted efforts to address these challenges, stakeholders can foster a culture of accountability, transparency, and excellence, thereby enhancing the overall resilience and reputation of the construction industry.

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