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Downtime cost Analysis for Construction Industry: An overview

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ABSTRACT: Cost and budget overruns on different types of projects may arise due to a broad variety of reasons. In the building sector scheduling is very critical for reducing and managing the project delay. However, much of India's construction delays were defined by budget overruns (Time). Transportation infrastructure growth primarily for public highway projects remains a key resource for achieving the ambitions of the Government of India's newly adopted economic principles. However, The importance of this sector and its impact on the national economy, concerns are frequently raised about the poor performance of these projects in terms of time , cost and quality, which directly imposed delay, cost overrun and quality shortfall problems on the construction of these projects. The aim of this study is to identify the critical factors that affect the cost overrun and to obtain statistical models using multiple regression and artificial neural networks. Models of regression are obtained by SPSS Applications. Furthermore, The analysis indicates that the professional workforce of the builder were inadequate and unwilling to carry out the job, the absence of coordination between the construction groups and the unavailability of skilled workers in the owner's and contractors' teams during the implementation of the job are the key reasons responsible for the pause in preparation, the cost overrun and, respectively, the efficiency shortfalls. Furthermore, guidelines to prevent and counteract the detrimental impact of these influences on the efficiency of the whole building industry.

KEYWORDS: Cost analysis, Delays, Construction Industry SPSS.

I. INTRODUCTION

The The positive assumptions associated with the minimum cost / maximum value precept become central to the baselines of the program which lead in cost overruns. If project costs or schedules exceed their planned targets, client there will be convergence to completion. The funding profile would no longer match the budget requirement and might result in further slippage in schedule. The resulting results will be negative in particular for developed countries whose wealth measure is heavily dependent on their success in the provision of infrastructure through the construction industry , in particular road building projects which are a major component of the industry. Cost overruns on government projects also draw considerable criticism from the administrative staff of the federal department, the budget oversight office, Congress, the White House, and even the general public. One may claim that, despite the diminishing budgets, certain federal agencies are motivated to cut expenses unrealistically and to exaggerate their technological efficiency.

The positive assumptions associated with the minimum cost / maximum value precept become central to the baselines of the program which lead in cost overruns. As the pursuit of more attractive services reduced funds from the Government, the willingness to minimize expense of the system increased. Later, wasteful methods of halting research, rising reach and efficiency or moving resources between programs arise when resources shortfalls genuinely exist. Of course, such short-sighted changes tend to accelerate cost growth. Cost escalation refers to the increase in the amount of money needed to build a road project beyond the original budgeted amount. In a report to classify causes that trigger inaccuracies in highway project cost forecasts, the Government Procurement Office reported that 77% of construction projects in the United States faced cost escalation due to delay.

A equally ambitious, success-oriented timetable can be ideally associated with an unreasonable expense role for the project. In addition, a sure-fire route to a cost overrun is an unachievable timeline in the practical realities of project design and execution. However, there are several aspects to the partnership between project delays and cost overruns. Will a gap in planning necessarily turn into a cost overrun? Are there certain elements of the timeline that lead to cost

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overruns, while not facing a delay? Could certain cost overruns in program execution be attributed to root factors, or are there other explanations? While the authors were unable to find a clear source, there is regular debate among project practitioners regarding the opinion that "80 to 90 percent of cost overruns are due to budget" Although quantitatively endorsing or refuting this opinion may be challenging, an analysis of the historical, analytical, and observable facts and observations may maybe shed further light on this argument. The value of time and expense in building projects in certain developed countries is not generally understood by the contractors and project managers. Most of the construction projects still have difficulties in preventing delay and cost overrun.

II. LITERATURE REVIEW

Hardware solution and gear management system for the contractual worker greatly affects a company's profit, particularly for contract workers with a profound interest in equipment. Hardware costs in designing structural design activities will range from 25-40 per cent of the overall cost of the enterprise. Information provided in this paper on how the organized and correct maintenance is essential for better production of development equipment. The details provided is usage of neighboring gear from month to month, and various reasons behind misfortunes in the production of hardware growth. Appropriate arranging, choice, acquirement, establishment, operation and upkeep of development hardware assume essential part underway in development ventures [1].

Technology equipment plays incredible vital position of the software business, costs as much as 36 percent of aggregate production expansion costs, even as it might be, hardware assistance has not been adequately addressed and that adds up to around 40 percent of aggregate technology expands enormous costs. The purpose of this review is to insure that development specialists understand and hold fast to correct methodology of gear upkeep as a productive part of the profitability of construction projects. A few surveys were prepared to use this data to test the elements and circulated amongst planning experts. Point of this paper is to decrease downtime, accomplish ideal gear usage and increment generation at least cost [2].

A systemic approach to idle time management will dramatically improve the lifetime performance of construction machinery, result in higher total production and effectively preserve public safety and the climate. To this end, this paper outlines research aimed at developing a method for calculating the idle periods of heavy machinery during a building project. A distributed sensor network is implemented to coordinate and present measures of idle times and output levels, and to notify project managers and field operators when idle time is surpassed. The designed user interface includes a graphical representation of the site layout to visualize the status of equipment in real time in support of project management and decision-making tasks [3].

The goal of this analysis was to construct a crane and get prepared for daunting hardware maintenance to boost health and productivity. XYZ Building has no methodical solution to holding the cranes and extensive equipment up. Their manner of coping with hardware maintenance could place specialists and properties at risk. This company recognizes the potential for catastrophe and assumes that strengthening their management program would help to mitigate this issue. So as to finish this, the paper utilized three stages to build up a support plan [4].

There has been an large collection of writing devoted to work on hardware creation. Numerous topics were explored which dissected, which accounted for various findings. Nevertheless, inquiry into papers transmitted with respect to building equipment is deeply divided, and there is a shortage of detailed analysis and structure. Thereafter, a full comprehension of the topic is impossible, nor is any prediction of potential work appropriate. A meta-analysis of the new diary papers dedicated to creation infrastructure would not only represent the fields in which scholastic work was based, but would also expose possible crevices for future study. [5].

After an audit of nitty gritty writing, eighteen specific issues are recognized which confront the UK technology industry. Consequently, the seriousness of such concerns as opened by senior managers of UK construction organizations, collected from a survey analysis, is shown. Discoveries show that the two most serious problems are considered to be the business's bad reputation and stigma, combined with'cattle rustler producers' domination. Changes in configuration are placed sixth, tracked through late increments, time constraints and reliance on oriented technique of offering [6].

For all the hassle and here and there end up costing the contract worker more than what he or she gets paid to complete it, the construction effort will fluctuate from mostly gainful to barely justified. The point of venture control in the development industry is to ensure that the undertakings are completed on time, within the spending plan and perform other venture exercises. Time and efficiency are two basic issues that raise cost-reduction approaches' importance. Reducing production costs is a clear goal for software industry [7].

Technology equipment plays an exceptionally remarkable position in the software sector, costing as large as 36 percent of aggregate technology extend costing, but the gear service has not been granted enough attention and that adds up to

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nearly 40% of aggregate software extend enormous costs. The purpose of this review is to insure that technology professionals understand and adhere to validated technique of hardware support as a powerful part of software venture profit. The review assessed this goal using the Research Survey Methodology (ISRA) technique [8].
The system for equipment management and gear organization effectively significantly influences transient workers ' productivity with greater involvement in technology. The cost of hardware will range from 25-40 per cent of the overall cost of the venture in structural design growth. The goal of this venture was to research how the arranged and suitable help is crucial for better generation production equipment. The knowledge analysis here is month-to - month hardware usage on position and various reasons for the misfortunes in the generation of production gears. If additional construction equipment is sent to the production site, it is necessary to determine whether a venture can be produced in a defined timeframe [9].
This paper would analyze the purposes and implications of introducing Full Productive Maintenance, which would also concentrate on measuring the total productivity of the machinery of building equipment. In large-scale construction operations the standard Equipment for Effective operations is needed, especially in the field of infrastructural production. This is the true picture of major building firms whose physical performance depends on individuals, resources and sophisticated machinery that will deliver productive production over a specified time of usage. Thus, the effectiveness of construction machineries is a major factor that differentiates construction companies in terms of heavy construction and light construction [10].

III. MODELING AND ANALYSIS

The best chosen method for gathering data has been disputed between qualitative and quantitative audiences. In general principle, any selected method either quantitative or qualitative based will be considered appropriate as long as it guides the anticipated research. Hence, the nature of given research determines the method that needed to accomplish better results [15].Qualitative method explores attitudes, behavior and personal vision through interviews or focus groups. It attempts to obtain opinions from specified participants in which few people take part in the research. In a paradox, quantitative method generates statistics through use of survey accompanied by the assistance of questionnaires. This type of methods reaches many participants, and the contact is much quicker than it is in qualitative [15].

The main differences between qualitative and quantitative research methods explained into following points:

- Quantitative data collection is more close ended in comparison with qualitative data collection that is based on more open ended.
- Quantitative data analysis used the statistical theories as background; Qualitative data analysis count on text or image analysis.
- Quantitative reporting has a set structure, as it grounded on mathematical elaboration; Qualitative data reporting is more flexible and may contain additional conscientiousness [6].

Research method of this study

The study of downtime cost analysis in Indian construction industry required large size of active participants in order to achieve good results. Therefore, a quantitative method based on survey was adopted and considered effective over qualitative because the target is to assimilate many responses in limited duration. Moreover, the acquired data might be easier to standardize in numeric form for later comparison than data obtained through qualitative methods. The choice was not easy though, because topic like downtime cost evaluation it might contain more investigations about human and machine interactions. In other meaning, the qualitative analysis could magnify the problem from different angles. However, the proposed survey was included semi structured questionnaires in which allow participants to present their opinions to some extent.
About Software
SPSS is a widely used program for statistical analysis in social science. It is also used by market researchers, health researchers, survey companies, government, education researchers, marketing organizations, data miners, and others. The original SPSS manual has been described as one of "sociology's most influential books" for allowing ordinary researchers to do their own statistical analysis.[4] In addition to statistical analysis, data management (case selection, file reshaping, creating derived data) and data documentation (a metadata dictionary was stored in the data file) are features of the base software.

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IV. RESULTS AND DISCUSSIONS

Factor Analysis (FA) is an exploratory technique applied to a set of observed variables that seeks to find underlying factors (subsets of variables) from which the observed variables were generated. For example, an individual's response to the questions on a college entrance test is influenced by underlying variables such as Intelligence, years in school, age, emotional state on the day of the test, amount of practice taking tests, and so on. Table 1 shows the communalities of the study selection, file reshaping, creating derived data) and data documentation (a metadata dictionary was stored in the data file) are features of the base software.

V. CONCLUSION

The study sought the views of clients, consultants, and contractors on the relative importance of the factors that cause delays in building construction projects. Organizations and project teams that recognize the factors that may contribute to, or cause, schedule delays and cost growth, and takes steps to reduce or eliminate their impact, are better positioned for project success. Indeed, some of these factors are clearly understood such as discrete risk events, while others are more subtle such as team conflict internally or with a supplier. Conduct pause and learn workshops or after action reviews to analyze the reasons and implications for significant schedule delays and cost overruns on projects when significant adverse events occur and implement standardized program planning and control practices that are repeatable and that the entire organization can use.

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VI. BIBLIOGRAPHY

Questionnaire Survey form

NAME OF INDUSTRY / ORGANIZATION: ----------
NAME OF SIGNATORY: ----------
DESIGNATION: ----------
DATE:
PLACE:
SEAL:
SIGNATURE:

.1. Incomplete drawing given by the consultant
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

2. Late Issuance of instructions by the consultant
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

3. Mistakes and discrepancies in design documentation?
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

4. Unclear and inadequate details in drawings?
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

5. Delay in quality assurance / control?
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

6. Late in approving and receiving of complete work?
- Strongly disagree
- Disagree
- Neutral
- Agree

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- Strongly agree

Project Related Delays

7. Delay due to the effects of subsurface conditions?
   - Strongly disagree
   - Disagree
   - Neutral
   - Agree
   - Strongly agree

8. Unavailability of utilities in site?
   - Strongly disagree
   - Disagree
   - Neutral
   - Agree
   - Strongly agree

9. Accident during construction?
   - Strongly disagree
   - Disagree
   - Neutral
   - Agree
   - Strongly agree

10. Problem with neighbours in the project location?
    - Strongly disagree
    - Disagree
    - Neutral
    - Agree
    - Strongly agree

11. Limited space of construction Area?
    - Strongly disagree
    - Disagree
    - Neutral
    - Agree
    - Strongly agree

12. Delay in shifting of long distance to borrow pits?
    - Strongly disagree
    - Disagree
    - Neutral
    - Agree
    - Strongly agree

13. Quantity increase over contract during Construction?
    - Strongly disagree
    - Disagree
    - Neutral
    - Agree
    - Strongly agree

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Cost Influencing Parameters

14. Terrain condition affects the cost overrun?
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

15. Soil & rock suitability / drill ability?
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

16. Material related problem (Transportation, Cost, Handling etc.)
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

17. Payment related problem from owner side
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

18. Poor communication between construction parties
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

19. Climatic condition
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

20. Lack of experience & knowledge of construction parties
- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

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21. Involvement of more No: of parties (contractor) in single project
    - Strongly disagree
    - Disagree
    - Neutral
    - Agree
    - Strongly agree

22. Lack of efficiency of contractor to achieve time goal of project?
    - Strongly disagree
    - Disagree
    - Neutral
    - Agree
    - Strongly agree

23. Thickness of various layers in case of flexible pavement (WBM, BBM, BM)
    - Strongly disagree
    - Disagree
    - Neutral
    - Agree
    - Strongly agree

24. Conflict among project participants
    - Strongly disagree
    - Disagree
    - Neutral
    - Agree
    - Strongly agree

25. Unreliable sources of materials on the local market?
    - Strongly disagree
    - Disagree
    - Neutral
    - Agree
    - Strongly agree