

PROPOSED MODEL TO STUDY THE EFFECTIVE UTILIZATION OF SPECIAL EQUIPMENT AT CONSTRUCTION SITE IN PUNE REGION – A REVIEW WORK

Pravin Dhumal¹, Prof. Hemant H Salunkhe²

¹M.Tech, Student, Civil (Construction & Management), School of Engineering and Technology, D.Y. Patil University, Ambi, Pune

²Faculty in Department of Civil Engineering, School of Engineering and Technology, D.Y. Patil University, Ambi, Pune

ABSTRACT

India's construction industry is going through changes after Corona Pandemic. It affected a large amount of construction work in terms men and material. Many of the equipment light and heavy one was seating idle. Gradually Development in Construction Sector gives rise to involvement of new and advance equipment in Construction Sector like use of Total Station, is survey and Cutting Machine like Tunnel Boring Machine, Hoisting like crane hanger. This review paper will study the utilization of such equipment. Methodology to be followed for this project is to study and shortlist such equipment to be used in Pune region comprising of Nagar Nashik or nearby region and prepare model on existing situation and to improve on the utilization of such Equipment in In Utilization aspect will be studied based on factors, cost, location, depreciating. This study will also focus on use of such equipment's cost benefit analysis of such equipment for Indian Situation. In this paper we just review the previous research of various researcher regarding this topic.

Keywords: *specialized equipment, utilization factors, cost benefit analysis.*

1. INTRODUCTION

The use of new equipment and innovative methods has made possible wholesale changes in construction technologies in recent decades. the choice of the appropriate type and size of construction equipment often affects the required amount of time and effort and thus the job- site productivity of a project. Most Equipment's falling under survey and excavation are imported. Unavailability of Skilled Labor for this project. Aim of this project is to know and shortlist such type of equipment and by using specific risk factors study of this can be completed with help of data collection from Nashik, Sambhaji Nagar Pune & Ahmednagar. Why we are choosing Pune area is that the two-decade development in residential and Infrastructure Sector.

2. LITERATURE REVIEW

Analysis of Delays during Initial Phase of Construction Projects and Mitigation Measures. Sunaitan Al Mutairi. World Academy of Science, Engineering and Technology International Journal of Economics and Management Engineering Vol:11, No:3, 2017, A perfect start is a key factor for project completion on time. The study examined the consequences of delayed mobilization of resources during the initial phases of the project. This paper mainly highlights the identification and categorization of all delays during the initial construction phase and their root cause analysis with corrective/control measures for the Kuwait company oil and gas projects. a comparatively good percentage of the delays identified during the project execution (Contract award to end of defects liability period) attributed to mobilization/preliminary activity delays. Data analysis demonstrated significant increase in average project delay during the last five years compared to the previous period. Contractors had delays/issues during the initial phase, which resulted in slippages and progressively increased, leading to time and cost overrun. Delays/issues not mitigated on time during the initial phase had very high impact on project completion. Data analysis of the delays for the past five years was administered using trend chart, scatterplot, process map, box plot, relative importance index and Pareto chart. Construction of any project inside the Gathering Centres involves complex management skills associated with work force, materials, plant, machineries, new technologies etc. Delay affects completion of projects and compromises quality, schedule and budget of project deliverables. Works executed as per plan during the initial phase and start-up duration of the project construction activities resulted in minor slippages/delays in project completion. additionally, there was an honest working environment between client and contractor resulting in better project execution and management. Mainly, the contractor was on the front foot within the execution of projects,

which had minimum/no delays during the initial and construction period. Hence, having an ideal start during the initial construction phase shall have a positive influence on the project success. Our research paper studies each sort of delay with some real examples supported by statistic results and suggests mitigation measures. Detailed analysis administered with all stakeholders based on impact and occurrence of delays to have a practical and effective outcome to mitigate the delays. The key to improvement is to possess proper control measures and periodic evaluation/audit to ensure implementation of the mitigation measures. the main target of this research is to reduce the delays encountered during the initial construction phase of the project life cycle.

A Thematic Review of the most Findings on Construction Equipment over Recent Years, Ilias Naskoudakis, Kleopatra Petroutsatou, 47(2), pp. 110-118, 2016 09 December 2016, This paper aims at providing the evolution in usage of Survey and Construction Equipment from the sooner ones to the latest one like GPS and Tunnel Boring Machine. there's a lot of findings going on CE. However, findings published about CE, are highly diversified, and there's a lack of systematic analysis and classification. A previously organized findings on this subject can only be traced within the review conducted by David J. Edwards and Gary D. Holt (Edwards and Holt, 2009). In their work, regarding future findings directions, the authors highlighted the following: Machine maintenance may develop addition sophisticated predictive models that enable “just-in-time” component replacement. Plant location and spatial data expanded to embrace large fleet management, The concepts of autonomous machine control, automated systems and robotics might all be addition inviting to finding Sers within the future given the advantages of “unmanned” machines, The adoption of nanotechnology and therefore the production of hybrids could be further possible avenues of development, Given the above, an updated review on the newest published academic papers dedicated to construction machinery should not only reveal the direction of findings but additionally, delineate any potential gaps for future findings. Contractors have also began to acknowledge and use telematics and other spatial technologies for timely collection of their equipment fleet data. To support heavy equipment fleet managers use telematic data in two major tasks: fleet use assessment and equipment health monitoring; Alshibani and Moselhi (2012) developed an optimization simulation model that uses a worldwide Positioning System (GPS) for fleet selection for excavation operations; Akhavian and Behzadan (2012) presented the results of a remote tracking technique developed to capture field data from construction equipment in real time that can be used to predict the performance of a construction system based on the latest status of the project; Pradhananga and Teizer (2013) presented the use of low-cost easy-to-install GPS data logging technology for tracking and analysing construction site operation of equipment resources. Overall, construction equipment management can improve construction project performance and contractor corporate performance; Samee and Pongpeng (2015) not only studied these relationships by collecting contractors’ opinions but also examined the causal relationships between construction equipment selection factors and competitive advantage of contractors (Samsee and Pongpeng, 2016). Addition over, Aziz et al. (2014) presented a sensible optimization model, which includes the basic concepts of Critical Path Method (CPM) with a multi-objective Genetic Algorithm to support the balance between time, cost and quality simultaneously for mega construction projects. Finally, Shawki et al. (2015) displayed a tool for simulating earthwork operations with the power to model all kinds of problems (deterministic, stochastic, discrete and continuous) in most applications of construction.

A statistical analysis of construction outfit form costs using held data & the accretion cost model. Zanew. Mitchell, The operation of heavy construction outfit is a delicate task. outfit directors are frequently called upon to make complex profitable opinions involving the machines in their charge. These opinions include those concerning accessions, conservation, repairs, rebuilds, reserves, and retreats. The outfit director must also be suitable to read internal reimbursement rates for their ministry. form and conservation expenditures can have significant impacts on these profitable opinions and vaticinations. The purpose of this exploration was to identify a retrogression model that can adequately represent form costs in terms of machine age in accretive hours of use. The study was conducted using field data on 270 heavy construction machines from four different companies. Nineteen different direct and converted on-linear models were estimated. An alternate- order polynomial expression was named as the stylish. It was demonstrated how this expression could be incorporated in the Accretive Cost Model developed by Vorster where it can be used to identify optimum profitable opinions. It was also demonstrated how outfit directors could form their own retrogression equations using standard spreadsheet and database software.

A Model Study on relative Cost Analysis of Equipment Management in Construction Companies in Tirupati Region. Saikumar Tenepalli, Construction Systems are fully different when compared to other systems. The main operations involved in constructions are excavation, digging, lading, hauling, leveling, etc. construction involves these different set of conditioning, to execute similar conditioning successfully there's the need to invest a high quantum of energy which is related to outfit energy. By acquiring proper outfit at the proper time at proper place, the profitability can be increased. Indeed, small companies also need to invest high budget in acquiring outfit. This exploration is related to only small construction company and Trust grounded project. Here it's important to define the small construction company, if the company is having one to nineteen persons as workers with lower periodic returns, also the company is called small construction company. Nunnally et al. (1977) described that outfit selection is a critical factor in the prosecution of numerous construction systems. This is to be much further critical in heavy construction systems where the outfit line plays a vital part in performing the work. In this type of systems, the outfit line may represent the largest portion of the shot price. Profitability will get varied whe constructions. The ideal of private constructions will be aimed to get profit where as in the case of public systems its end isn't profitability, it works for conditions. The thing of this study is to show the difference in conservation of both projects. al. (1976) proposed a system of estimating costs that comported of multiplying a number of factors times a multiple of the original purchase price of a machine. These factors took into account type of outfit, total hours of use, times of useful life, temperature, work conditions, conservation, quality, type of use, driver style, outfit quality, pace of work, and luck.

Enhancement of Overall outfit Effectiveness In a Plastic Injection Moulding Industry, E. Sivaselvam, S. Gajendran IOSR Journal of Mechanical and Civil Engineering(IOSR- JMCE) e- ISSN 2278- 1684, p- ISSN 2320 – 334X PP 12- 16, Using overall outfit effectiveness computations one can determine the present situation in the product system, effectiveness of the conservation system, conditions of the machines, worker's skill and application of the machines ' can be expressed as the rate of the factual affair of the outfit divided by the maximum affair of the outfit under the stylish performance condition. (OEE) is used to measure the overall performance of the outfit and to determine how efficiently a machine is running. OEE depends on the introductory three factors Vacuity, Performance and Quality.

OEE CALCULATION METHOD

Planned product time = Shift length – break

Operating time = Planned product time- time-out loss

Vacuity = (Operating time / Planned product time)

factual cycle time = (Operating time / No of products produced)

Performance = (Standard cycle time / factual cycle time)

Quality = (Good product/ Total product) OEE = Vacuity × Performance × Quality

World Class OEE set up to be 85 for the manufacturing diligence.

Roadway system to calculate OEE is shown below. But where problem occurs exactly isn't set up out.

OEE = (Good corridor × standard cycle time) / Planned product time

Operation of Equipment & Machinery in Construction, Prajeesh.V. P, Mr.N. Sakthivel, IJISSET- International Journal of Innovative wisdom, Engineering & Technology, Vol. 3 Issue 5, May 2016, In comparing the study of outfit operation on Shobha megacity with the check result of outfit operation in the other shared company is that, nearly all the operation of accoutrements the position I companies are nearly same. They're all having the one end, maximize the profit and minimize the cost. all the position one companies in the accession of the outfit, economics of outfit, operation and conservation of outfit. In Shobha the use of computers in managing the outfit for the allocation

of different outfit in different spots, to modernize their conservation, form and also modernize their costs. They used to resale their old outfit if a seductive price is offered.

Only one third of the construction diligence were set up to have proved programs, it was set up that there's a invariant practice of operation among diligence. This indicates that there's a policy for operation although it isn't duly proved. The fact that diligence or contractors claim a gain from the resale of their outfit indicates that the outfit is managed profitably. The main thing of any operation policy is to enable optimization of coffers and maximization of gains. The operation practices of the contractors and construction diligence of India suggest that they achieve the pretensions of good operation, and they follow the stylish practice suited to their conditions. Indeed, though there's no spoken policy with utmost of them, the perpetration of sound principles of operation as well as the influence of experience leads to profitable operation of outfit.

3. MATERIAL AND METHODS

Methodology adopted for the above objectives are given below: -

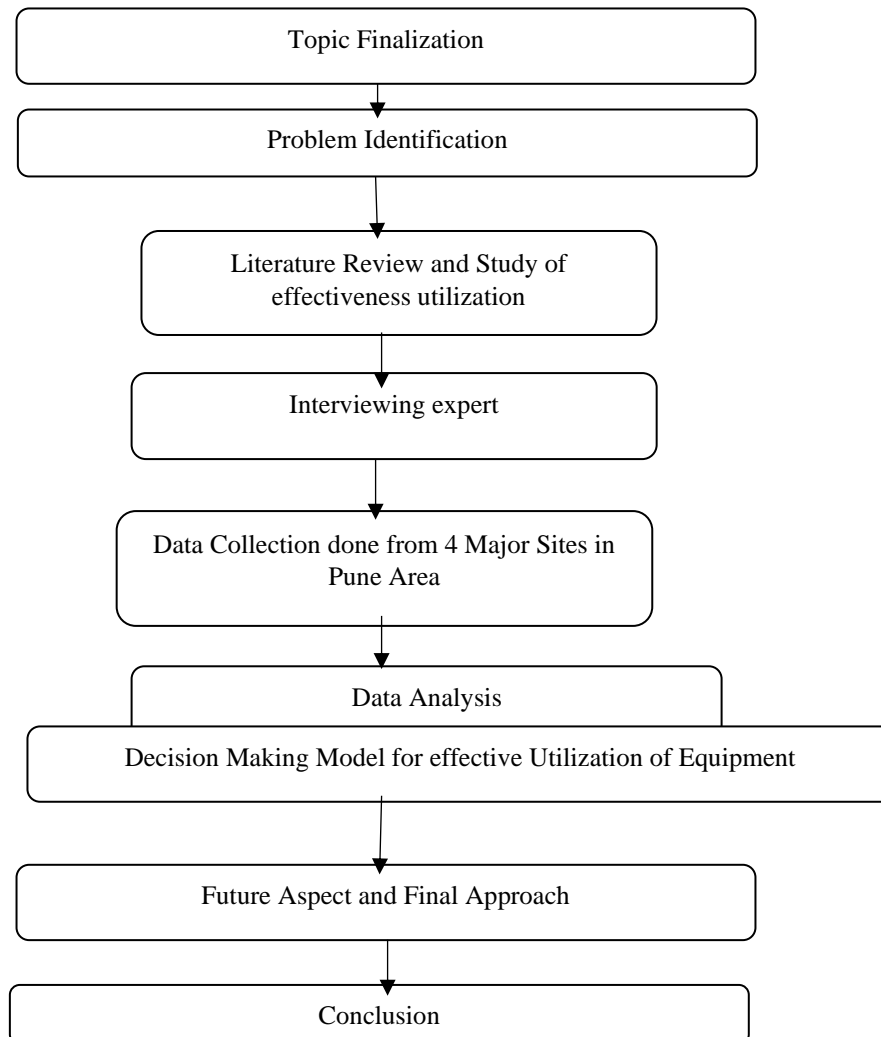


Fig No 1. Methodology of Dissertation

4. CONCLUSION

As per the literature review, the decision-making tool to probably will give some critical factors for the understanding of effective utilization of equipment. Factors like cost, operation, maintenance, skilled labor force play a key role in the management decision making. Addition of this input in the SPSS will provide a different result will give decision makers ability to take sound decision.

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