



THE USE OF TECHNOLOGY IN RESOURCE MANAGEMENT FOR HIGH-RISE BUILDING CONSTRUCTION: A LITERATURE REVIEW

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Abstract

Resource administration is one of the foremost critical administration assignments and makes methodology execution attainable. Those organizations in which vital administration isn't actualized assets are apportioned based on individual or political components. In strategy-based organizations, but, assets are distributed based on priorities determined by yearly destinations. One of the most impediments of effective execution of organization techniques is the disappointment in connecting official plans and deciding the need in apportioning assets to vital long-term programs. These days most organizations have a isolated handle for long- term vital arranging and yearly and short-term budgeting. Each organization, at least, has four sorts of assets to be designated in arrange to realize organizational objectives. These assets incorporate: budgetary assets, physical assets, human assets and innovation assets Resources may be allocated in an effective manner while success of strategy Implementation is not assured since success is achieved when plans, employees, operations, controls and commitments act to maintain and survive allocated resources. in these thesis we study concept of resource management and apply this techniques for construction planning of high rise building

Keywords: Resource Management, Construction, high Rise Building, material management.

I) Introduction: High Rise structures everywhere throughout the world are getting well known over some stretch of time and the tallness of these structure continues expanding. With the start of current development strategy and calculations, the essential point has been to build more secure structures keeping in see the general costing of the task.

According to Indian Standard Codes the standard limit for Multi-storeyed structure is 35 to 100m. Under the rule of Hyderabad Building Code a Multi-storeyed structure is having 15m or more. Theses Multi-storeyed structure are commonly referred as "Multi-Dwelling" or "Vertical Cities." These structure have capabilities to decongest the urban areas, and increasing density per sq.km on

housing by satisfying the demand chain and altogether increasing the standard of living.

In India, buildings taller than 75 feet (23 m), usually 7 to 10 storeys, are considered high. Also, a building is considered high when it exceeds the maximum access available to firefighters. According to the Indian Building Code, a building is considered tall when a four story building or taller structure with a height of 15m or more. The BMC proposes that any building with a height of 30m (nine floors) should be classified as high. This is an increase of 6 meters from the current definition (24 meters or seven floors) (Isasare, A. S., & Bhirud, A. N. ,2018).

Because of a dynamically serious condition, building organizations are compelled to be more creative and accomplish serious working favorable position. Organizations are continually searching for improvements in hardware highlights, specialized devices, efficient administration methods, and preparing HR. Structure associations are additionally narrowing their center, turning out to be specialists in particular kinds of development ventures. This specialization requires more engaged undertaking arranging and observing strategies that end up being better for particular sort of ventures while giving specific development administrations. The advantages of powerful arranging, booking and control of development ventures are: decreased development time, diminished cost invades. Planning is the way toward characterizing all the exercises important to effectively finish the venture.

Scheduling is the process of determining the chronology of planned activities, providing actual breaks for each activity, and determining the start and end dates of each activity.

The process of changing a general or outline plan for a project into a time-based

visuals presentation given information on available resource and time restraints.

Construction Planning is the necessary tool for scheduling and completion of Project and the main factors depends on it are:

- Defining work tasks
- Determining general sequence
- Defining construction methods
- Assigning responsibility

Significance: Because construction projects are resource-driven, managing resources may be quite challenging. Prior to the start of the work, it is done to plan the resources. In a building project, a resource could be labour, materials, money, equipment, time, or space. Each task in building is given a certain set of resources. The availability of resources has a direct impact on the duration and cost. The efficiency of the available resources and the volume of work involved in an activity are used to calculate the amount of time needed to complete it. The contractor is primarily responsible for determining how different resources must work together to complete an operation.

II Literature Review : The past researchers research in all aspects is covered in this literature review

a) Rational management Aspects

Abhijit N. Bhirud (2020) Quality parameter plays critical part in tall rise building development ventures with regard to completion of development inside given budget and stipulated time length with ideal assets. To decrease basic components influencing on quality of tall rise buildings, legitimate monetary budget is apportioned for planned development exercises. Convenient supervision and checking of development exercises is done through location bosses, senior engineers and quality investigator as well as present day devices and methods. Solid smooth communication & coordination among diverse office like materials, HR,

Hardware & accounts and people working on location makes a difference in moving forward quality of development. Quality mindfulness program and quality control strategies ought to be executed time to time for quality advancements in development ventures. Capable human assets makes a difference in redressing and diagnosing absconds or non-conformities watched amid diverse development exercises. Arrangements of actually competent venture directors as well as temporary workers are accommodating in progressing quality issues in tall rise building extend

T. Kravchunovska (2020) Authors choose the rational management of the high-rise building construction projects, it is proposed to apply the approach based on the search for solutions that best correspond to the desired (assigned) technical and economic characteristics (indicators), based on the use of statistical modeling of projects as manageable processes. At the same time, when choosing a rational decision, it is advisable to take into consideration the influence of determining organizational-technological, technical, and managerial factors in compliance with the requirements on cost-effectiveness, energy-saving, safety, quality, and environmental friendliness. The structure of the organizational and technological factors include: reliability of a construction organization, the quality of a high-rise building.

K.A.Karthick Raja (2020) In this research The allocation of required resources is needed to complete a project within scheduled time. This paper presents the preparation of required labour resources according to the scheduled activities in construction of gated community and also presents resource constrained analysis which involves resource leveling and resource optimization. Based on the analysis time-cost variations were

obtained. It was observed that, for decrease in resource constraints there is an increase in project durations from 368 days up to 378 days according to various resources. When the project duration increase, it apparently results an increase in total project costs from 0.006% to 0.093% accordingly (Bhirud, A. N., & Revatkar, B. M., 2016).

SK. Nagaraju (2018) Author Stated that he nature of the construction industry is unique in characterized by complex deployment pattern of resources resulting in risk and uncertainty inherent in every phase of the project life cycle. In fact a state-of-the art resource management is essential for a construction project to succeed in fulfilling its project objectives. Allocation of resources for activities is necessary in construction domain to complete the project within the scheduled time. Resource leveling is needed in construction projects to avoid the difficulties associated with the large variations in resource usage. The paper presents a project schedule with time constrained due to the client's requirement. All the activities of the schedule are critical (total float zero). The only option to increase schedule time is possible by resource leveling. The resource type for this schedule is considered manpower (labour) only (Jadhav, O. U., & Bhirud, A. N., 2015).

b) Project Management Aspects

Jayakumar Muthuramalingam (2018) Paper focus on the process-based project management system controlled by the quality standards may be viable solutions for the success. In construction sector, rather than adopting the optimum design procedures, the effective construction methodology and planning will result in significant savings in resources. This paper describes the line of balancing

techniques to minimize the quantity and maximize the productivity of human resources. The effective utilization of resources by establishing average demand over the maximum project periods by resources smoothening techniques are outlined in this paper.

Min-Yuan Cheng et.al. (2017) made a study that human resource planning in construction management process developed a team based human resource planning for deploying labor power. The purpose THRP method is to determine the maximum loading of projects and to identify the range of labor power required for expected project loadings in the future. In this THRP method, BPR philosophy is applied to integrate organizational functions such as process reengineering, data preparing, human resource allocation and simulation. In a real case study, this method reorganised the structure of the company to facilitate newly designed process and simulation to predict labour power capability for the new organization (Bhirud, A. N., & Revatkar, B. M. ,2016).

Amin Akhavan Tabassi , A.H. Abu Bakar (2018) This Paper told that Many of Iranian labour have low levels of education, low income, lack of motivation, and family problems. The Iranian government, by legislating new rules and regulations to support labour, can play an important role in improving their state of affairs. Some of the endeavours, which can be applied by the government, are as follows: increasing social security, paying some of their costs of living, requiring companies to use labour with certification of fitness of occupation in the projects, and social insurance (Bhirud, A. N., & Vasant, K. G. ,2015). Training institutes should be developed in both private and governmental sectors. – Friendly environment should be made through which managers, staffs, and workers can discuss and learn from each other. – A

work environment should be created to influence employees' innovative and personal commitment. – Paper finally conclude that Using incentives such as workers' participation, recognition, and team belonging for motivating staff and workers – Introducing and recommending TVTO centers to the workers and encouraging them to participate in their courses.

Abhishek A. Sutar and Aditya P. Mehendale (2017) . stated that construction industry makes a significant contribution to the national economy and provides employment to large number of people. Human resource management plays an important role in the process of project management. Human Resource Management can be done at International construction as well as at the project level. In this paper Organizational structure was developed and it represents key responsibilities of every personnel (John, B., Khobragade, N., & Bhambulkar, A. V.,2023)

c) Resource Scheduling Aspects

Stefanie G. Brandenburg et.al. (2016) Resource Scheduling of Construction Project: Case Study”, International Journal of Science and Research, May 2015, Vol. 4, pp. 563-568 has made research study that Centre for Construction Industry Studies have proposed a two tier strategy to workforce management. These metrics are important in facilitating the implementation of an HRM strategy that effectively represents the goals and objectives of the firm. In the Tier I strategy, data are collected regarding background, skill levels of workers. The Tier I strategy got the average score of 6.98 out of 10.0. This provides the scope for further development of Tier II strategy.

Dr.K.Divakar (2015) Authors find significant factors causing problems on resource management in construction industry. For this research Data collection was carried out through a structured

questionnaire survey consisting of 70 factors identified through a comprehensive literature review. Data were analyzed with Predictive Analytic software (PASW). The factors were ranked through mean rank calculation. The opinion of respondents regarding the severity of each cause was checked by analysis of variance. Relation between pairs of variables was examined by using Spearman's rank order correlation. Case study is conducted to find the impact of problems occurred in resource management.

Maruthi S et.al. (2015) stated, now a days many construction projects are coming out due to high demand of infrastructure developments. In project management, there are two types of resource scheduling problems are resource allocation and resource levelling. The resource allocation in which resources are allocated based on scheduled activities. The resource leveling in which resources are allocated to the critical activities from the noncritical activities. The proper optimization of resources is very important to reduce overall project costs.

Wajid Hussain et.al. (2015) stated that due to complex nature of construction projects resource allocation and levelling is one of the top challenges. CPM and PERT is commonly used for scheduling large scale projects. This paper briefs about resource allocation and leveling in construction projects. Genetic algorithm was applied in resource allocation and levelling. It's procedure was implemented in MATLAB software. The result shows increase in project duration after resource allocation and leveling for 100 generations (Vaibhav Prabhakar Mestry et al., 2023).

d) Human Resource Aspects

Renard Yung Jhien Siew (2014) .Human Resource Management in the Construction Industry -Sustainability Competencies", Australasian Journal of Construction Economics and Building, 2014, Vol. 14, pp. 87-103. stated that Human Resource

management has been evolved as an enabler for sustainability. This paper some concepts of recruitment and performance management are given. He linked several eight competencies such as safe auditing, project risk management, monitoring, communication, etc with the recruitment and performance management. It is mapped to proficiency levels suggested by CRC construction innovation.

SK.Nagaraju (2012) made a case study about resource management in construction projects. In general construction projects, they employ huge resources of men, materials and machines for major works. Unless required resources are planned and procured, no activity can be executed within scheduled time. Project managers are responsible for taking complex decisions under different scheduling and under conditions of extended task durations. The increased durations results increase in costs (Patil, R. N., & Bhambulkar, A. V.,2020).

I.Othman et.al. (2012) stated that in construction projects, one of the major problem is human resource management. It is still inadequate and insufficient. This paper presents the pilot survey based on HRM in construction of sustainable development projects regarding years of experience, no. of projects involved and problems faced. The implementation of human resources with insufficient duration got the lowest average index. HRM needs to be improved from time to time for its effectiveness for growth in construction industry (Bhambulkar et al., 2023).

III Summary : Construction projects contain numerous inter-dependent and inter-related activities. The fast changing environments of the present era impose numerous financial, legal, ethical, environmental and logistic constraints. They interact technically, economically and socially within the environment as well as with other organisation, structures

and systems. These projects employ voluminous resources. But they have in-built difficulties, uncertainties and risks. These pose series of problems concerning resources, like how much they are required, 'where they are going to come from', 'when they should be inducted at site', where they should be housed', 'how to optimise their utilisation' and 'when to demobilise'. In general, construction projects are of high value, and they employ huge resources of men, materials and machines. Major works involve heavy investments- say from a hundreds of crores of rupees to a few thousands of rupees, the use of high level technology and need an open ended model for effective management of resources. Due to the resource-driven nature of construction management, Resource Management is really a difficult task. The construction manager must develop a plan of action for directing and controlling resources of workers, machines and materials in coordinated and timely manner in order to deliver a project within the frame of limited funding and time. Hence, aside from a technology and process focus, a resource-use focus must be adequately addressed in describing a construction method or operation in a project plan.

IV Conclusion: With the rise of development of the nation, the assignment of development handle as fantastically expanded. So viable asset administration decrease misfortune of time. Over the think about Appropriate asset administration think about gives the straightforwardness in extend. The nature of the development industry is interesting in characterized by complex sending design of assets coming about in chance and vulnerability inborn in each stage of the venture life cycle. In reality a state-of-the craftsmanship asset administration is basic for a development venture to succeed in satisfying its venture destinations. Allotment of assets for exercises is vital in development space to total the extend

inside the planned time. Resource leveling is needed in construction projects to avoid the difficulties associated with the large variations in resource usage. The resource optimization and resource leveling problem is one of the highly important issues in project accomplishment and has been ever taken into consideration by project manager.

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