

A REVIEW ON TECHNIQUES FOR IMPROVING THE PROFITABILITY OF SMALL AND MEDIUM CONSTRUCTION FIRMS

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Abstract - The productivity level of construction industry (Small, medium and large) is mostly depending upon three factors they are labor characteristics, management systems/software and external issues ,project management. Different researchers have determined different factors that influence construction productivity. Understanding the level of productivity, it is important to develop innovative practices and techniques to improve construction productivity. This report includes systematic literature reviews on productivity in construction industry for small, medium and high organizations. The report gives review on different method which is used for measurement of construction productivity, factors affecting and theories on improvement of construction productivity such as labor factor, management factors and external factors, the report further reviews on the different innovations which are made for improvement in construction productivity. On reviews it is noted that there are lot of different methods and strategies for improvement of construction productivity but they differs from site conditions and the factors which influence construction productivity. In this project we can compare latest and traditional approach for G+7 residential building located at **Ambegaon Pune**.

Key Words: Labor Productivity, Construction Management Software, Construction, External Issues, Materials Management and Safety

1. INTRODUCTION

1.1 Construction Industry Scenario in India

Construction industry is world's most largest and challenging industry in India. Human resource has a strategic role in increasing productivity in construction industry. With the effective and optimum use of human resources can help in productivity growth. The construction projects are mostly labor based with basic use of hand tools and equipment's in which labor cost consists of about 30% to 50% of total project cost [1]Indian

construction industry is one of fastest growing sector globally. The construction sector gives second largest employment after agriculture. India shares about 8% of total GDP and also provides employment to around 35 million peoples directly or indirectly [2] In construction industry one of the biggest problems faced is of unskilled labor which implies in productivity loss and impacts on cost overrun and schedule daily. Labor productivity is one of important factor which affects physical progress of construction project. To perform effective job, construction labor should be familiar with materials, tools and machineries that they use. Many researchers have shown that poor construction management practices leads to poor performance, wastage of efforts in different phases of construction projects. Researchers tried to overcome some of challenges by adding their efforts in construction project, however many problems are yet to be solved in terms of construction productivity. Identifying and analyzing the critical factor that influence construction productivity will lead to develop most effective method and strategies to improve the construction productivity in upcoming time [3]. Construction project is said to be successful if it is completed in schedule duration and estimated cost. For that purpose productivity has to be efficient. Productivity forecasting plays an important role in strategic and operational planning. Quantitative forecasting is used for decision making process for many of complex situations [4].

Site productivity is one of difficult factor for measurement because they can be determined significantly depending upon size of site and place of measurement. Some of researchers have determine the method of measurement and analysis of site productivity for setting baseline and for the improvement of construction productivity, some of them are average labour productivity (ALP), one factor input, total productivity (multifactor), work measurement, cycle time etc. site material management can largely affect site productivity, the new automated Technologies have been emerged such as Global positioning system (GPS)

and radio frequency identification (RFID) which can help in improving productivity in Material Management [5] .

1.2 Background

The contribution of Indian construction industry to GDP is about 8 % on an average in last 5 years (Planning Commission of India 12th five-year plan, 2015). Indian construction industry provides employment approx. 41 million persons and it is ranked second in providing jobs after Agriculture sector in India. The construction sector is the 2nd largest producer of jobs in India after Agriculture and still the employment generation and the economic importance of the sector, it encounters issues such as low productivity, delays in completion of projects and lack of professional practices in the industry. The construction industry is an important activity within most economies and the GDP get influenced by Construction Productivity and the GDP also influences the Construction industry. Construction sector strongly affects various other sectors and having a direct impact over various economical, educational, Transportation, and other sectors. .

1.3 Motivation

The Indian construction sector grows significantly over the past 15 years and enjoyed the benefits of growing economy and FDI funds through other developed countries but still face the issue of low construction productivity, delay in completion of projects and a number of projects experience cost overrun. Construction industry majorly falling in the following domains or sub-sectors is:

- **Buildings:** Residential buildings, Commercial and Institutional buildings.
- **Infrastructure:** Road, Rail, telecommunication systems, urban infrastructure, Dams, Canals, airports, power systems, and sewage & drainage systems.
- **Industrial:** Type-specific industrial construction, Power plant construction, nuclear plant construction and another type of construction.

Construction industry creates a flow of physical assets into a number to sectors in Indian economy. Indian construction industry having approx. 31,000 enterprises involved and providing employment to approx. 41 million persons. The number rises from 14.5 million in 1951 to 41 million in 2011, it is around 300 % growth in the span of 60 years. The most number of entities related to construction is of small scale having less than 200 employee's i.e. 29,600 firms employ less than 200 persons. As you can interpret the above data the percentage of small enterprises is large, which cleared the ground for the following statements:

1. The industry is highly unstructured because the 95% of the total number of enterprises are small enterprises.
2. There is a lack of standard and in the implementation of standards due to the size of the enterprises.
3. There is no proper scheme for construction of skills.

4. There should be a systematic approach and plan to enhance the skills of the number of tradesmen employed in Indian construction industry.

5. They should be aware of sustainable practices in construction and the effect of sustainable practices in construction/green construction on the environment and energy requirement of the buildings.

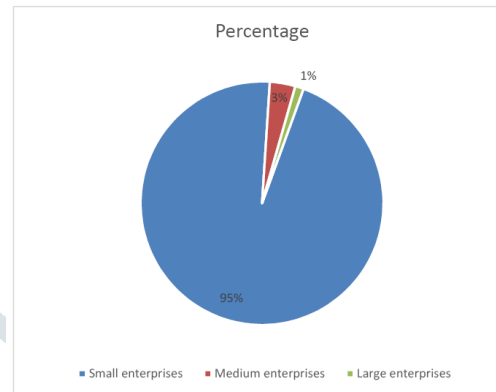


Figure No 01 Construction Industry wise firm ratio.

1.4 Construction Productivity

In simple words, productivity can be defined as the output over input that indicates the efficiency of a productive system. It ensures optimal use of the resources involved in the system, as well as the smooth and uninterrupted flow of the process.

Productivity = Output/Input "Efficiency or productivity of any resource has been characterized by the (OECD) "a proportion of a volume measure of yield to a volume measure of input utilised for the specific activity of process in the production of goods, services or any other product and

Construction"(OECD, 2001). It is a relative idea with correlations either being set aside a few minutes or between various generation units, which can be considered as far as capital, speculation, work, or other appropriate information sources and yields. Efficiency can be characterized, accordingly, by the accompanying condition" . Construction productivity includes the productivity of Man, Machine, Supply Chain, and Logistics support, Technology, Capital, Energy and other resources that we used during the course of Construction of a project at a specific timeline using the resources and produces output.

Productivity = Output obtained/input expended or Resources used

1.5 Indian Construction Industry

The Construction Industry having the average yearly turnover 3.85 lakh crore. But every year we face a huge loss of revenue due to a number of problems accounted by the industry and losses due to poor productivity is one of the major problems. In fact, the amount of loss in productivity is even more than 30% in India which creates a serious area of concern for construction practitioners. Basically, the successful & timely completion of

any construction project is dependent upon the productivity of the labour, machinery and processes it involve. Several standards have been made by authorized bodies like CPWD, Bureau of Indian Standards etc in order to set the productivity norms for various construction related activities. But in order to optimize both cost & time and to minimize the wastage of other resources as well (which is also the key philosophy of Lean Construction), it is extremely crucial that the productivity of the resources involved in any project is closely monitored and suitable actions are taken for their improvement.

1.6 Problem Statement

In Traditional approach the general business problem was that small & medium construction company or firms in India were unable to manage effectively the workforce, management software's, resources which resulted in a loss of labor profitability. The specific business problem was that small & medium construction firms in India lacked strategies to improve the profitability for that they need a qualitative approach.

1.7 Objective of the project

- a) To implement qualitative approach over conventional approach on different firms.
- b) To apply standard project plan .(planning-execution-control) PEC Approach.
- c) To Improves quality of work.
- d) To save cost and maximize profitability.
- e) To Ensures environmental friendliness.
- f) To Enhance Brand value of the firm.

1.8 Scope of the project

In this project we compare case study with latest and traditional approach for G+7 residential building located at **Ambegaon Pune**. We used a qualitative research method and explored the strategies that construction company leaders used to improve labor productivity. The qualitative method was appropriate for the study because a qualitative approach enables researchers to explore and understand one or more phenomena.

2. LITERATURE REVIEW

Inta Kotane et al. In the circumstances of globalization, the assessment of the companies' business performance becomes crucially important for small and medium-sized enterprises (SMEs). Despite a wide variety of the methods for evaluation of the companies' financial performance offered by the theory of economics, the issue on what is the optimal method to be chosen and to be applied by the company to manage efficiently the enterprise is still up-to-date. During the research performed by the authors, it was

established that the SMEs business performance assessment in Latvia can be carried out mainly using just financial indicators. The research reveals inadequacy of traditional performance measurement approach based on the analysis of just financial indicators of the economic activities and explains its insolvency by using as an example the analysis of financial conditions of some bankrupted companies during the recent years of their existence. The current research is based on the analysis of scientific publications, results of the authors' previous studies, and the results of the expert survey.

Piotr waśniewski et al. The performance measurement system is one of the determinants which creates an enterprise's value, and is supposed to leading to an enterprise maintaining or improving its performance in the long term per spective. Small enterprises do not understand the need to measure their performance or the potential benefits that come from this measurement. The aim of the article is to present a framework of a perform mince measurement system for small enterprises with a practical verification of its assumptions. The basis of the study was an analysis of existing proposals of models and frameworks for small and medium enterprises and the results of a study into the performance measurement solutions applied in practice by Polish small enterprises. As a result of the research conducted, a 4 step process of continuous performance measurement for small enterprises is presented, and practical verification is conducted on the example of a small legal firm, considering the strategy map and the measures of the set of aims. The construction of a performance measurement system is unique to every enterprise due to its condition, the business sector, the environment, and other factors, so a featured case study provides only a specific example of model usage in practice. The study provides an original contribution of the author. There has been no such research in this field so far in the Polish literature.

Farah Margaretha et al. The objective of this research is to examine factors affecting profitability such as firm size, firm age, growth, lagged profitability, productivity, and industry

Affiliation of SMEs firm listed in Indonesia Stock Exchange. Source of data used in this study is secondary data based on index pefindo 25. The results showed that firm size, growth, lagged profitability, productivity and industry affiliation significantly effect on profitability. While the variable firm age does not significantly influence profitability. The results of the regression coefficient indicates that the variable firm size, growth, lagged profitability have a negative effect on profitability, While the variable productivity and industry affiliation have a positive impact on profitability. Therefore, for further improve company's performance the manager should define a strategy to increasing profitability with focusing on productivity and industry affiliation.

Mahmood Mokhtariani et al. The construction industry in most countries worldwide is characterized by extreme competitiveness, high risk, and usually low profit margin in comparison with many other industries. The major reason for this intensive competitiveness

Is the relative ease of entry into the construction industry compared to other industries, even for people or companies with little capital investment? Furthermore, to find a new project, construction firms have to participate in a competitive bidding process, as it is not generally possible for them to induce demand for their services. These conditions lead to a significantly higher rate of business failure in the construction industry than that in many other businesses in the recent decades.

Olanrewaju Abdul Balogun et al. The contribution of Small and Medium-sized Enterprise (SME) sector in economic development, job creation and income generation has been recognized worldwide. These contributions are effectively articulated in South Africa construction industry discourse. However, the main problem limiting the SMEs sector to contribute fully in the mainstream economy is the shortage of finance. This study examines the impact of firm characteristics in access to credit by the South African SMEs in the construction industry. A deductive methodological approach was used to examine this problem. This report utilizes a combination of primary data emanating from structured survey questionnaires supplemented by secondary source of data from an extensive literature review, in order to present insightful commentary about credit accessibility within SMEs in South Africa. The structured survey questionnaire was administered to 179 construction small and medium organizations to elicit relevant data about their credit accessibility. Binary logistic regression was applied to determine the influence of demographic variables on credit accessibility. The equation specified access to credit as dependent variable while firm and personnel characteristics as independent variable. The statistical package for social science version 22 was used. The results indicate that firm

Characteristics influence access to finance. The study recommends that South Africa SME contractors should maintain attractive firm attributes to stimulate lenders to extend finance to their investments.

Rodney A. Stewart et al. Research has indicated that the economic activity of small firms has increased substantially in the past twenty years (Hughes 1997). The employment growth rate has also been greater in small firms than large organizations offering further evidence of the importance of the small firm sector (Enterprise in Europe 1994). Small firms have offered lessons to large organizations in terms of surviving within a volatile environment, and provided a focus for economic and management enquiry (Hughes 1997). A paradox however exists in many sectors. The theory essentially focuses on large organizations and their potential for development and employment, although the significance of such firms

have receded. Some theory fails to offer a clear picture of an economy that actually possesses a structure of small firms that are responsive to change, are a major source of innovation and are important job creators (Barrow 1993). The construction SMEs and the industry as a whole has been criticized by many with regard to its adversarial nature, the take up of new technologies and processes and issues associated with organizational management (Miller et al 2002). Historically, large construction firms have taken remedial action to negate the effects of declining profits and economic recession. One strategic option available to the large firm is to retrench back into core business areas and organizations. Retrenchment and disinvestment strategies enable larger diversified firms to disregard peripheral business activity and instead concentrate on areas in which they enjoy distinct competencies or superior competitive advantage.

AmanuelGirmaYismalet et al. Construction cost management is the most important function for project success, and the construction project performance is generally expressed in terms of cost and its variance from the budget. However, it has not been effectively used due to the presence of a large quantity of data with many complex interrelationships. Construction firms, being project based organizations, have to develop their project management capacity in order to accomplish firm and project objectives successfully. Hence contractors need to focus on project cost management process. The study presents the limitations, drawbacks and shortcomings of each project cost management functions related to current practices of domestic contractors, which need to be improved for achieving the predefined project objectives and the profitability of contractors along with the proposed improvement recommendations, through critical literature review.

Lutfi Abdul Razak et al. Applying the General-to-Specific modeling on World Bank Enterprise Survey data for 266 economies, this report models five performance indicators based on 80 potential factors derived from firm characteristics, finance, informality, infrastructure, innovation, technology, regulation, taxes, trade and workforce concerning small and medium enterprises (SMEs). We find that the factors vary regarding statistical significance and magnitude between small and medium enterprises. For example, the percent of firms using e-mail to interact with clients/suppliers has a positive effect on the annual employment growth of medium enterprises, but not the case of small enterprises. The proportion of investments financed by equity or stock sales has an adverse impact on small enterprises, while there is no such effect on medium enterprises. We find that more drivers explained the annual employment growth and the percent of firms buying fixed assets compared to capacity utilization, annual labor productivity growth, and real annual sales growth.

Abdulrahman Bageis et al. The aim of the present report is to explore basic factors that assist new and existing small and medium sized construction enterprises (SMEs) to be successful. This report reports on the results of a preliminary study that examined these factors globally. Then the report examines the findings in the context of construction contracting firms operating in Saudi Arabia (SA). The report presents a literature review conducted to determine basic factors affecting the performance of small contracting companies. This review identifies a large number of factors that are seen as being potentially significant in delivering organizational success. The report identifies intra and inters organization success factors and asserts that their recognition can lead to company success. Also, the report suggests a business success model that is based on the factors identified. The next phase of the work involves exploring the relationship between project cost control and business success in more depth via a small number of project-centered case studies so as to develop an initial conceptual model of business maturity. The report contributes to the body of knowledge available on SMEs in construction and identifies factors thought to be some of the keys in driving forward the management and practice performance agenda in the construction industry.

CONCLUSION

From the above literature it is concluded that there are many methods of increasing productivity and profitability in construction industry. There is enormous study on the methods which improve the profitability which consists of material tracking, healthy and safe working condition and effective management systems. It is seen that some methods are more efficient in the context of increasing productivity. In this project we compare case study with qualitative and traditional approach for G+7 residential building located at **Ambegaon Pune**. There is a need for exploring more efficient strategies for improving the productivity as well as profitability of the small and medium construction firms. It has been noted that increasing the profitability by such above methods have reduced cost and time but haven't create an effective baseline in the field of construction industry. It will also useful for small and medium construction firms in India.

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