



EVALUATION OF LABOUR PRODUCTIVITY IN CONSTRUCTION FIRMS

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Abstract: Construction industry is one of the Labour intensive industries where human capital is considered as the greatest asset of the organization. Companies need to invest in order to ensure growth and survival of these assets India's Labour Productivity dropped by 5.52 % in Dec 2019, compared with a growth of 5.80 % in the previous year. India's Labour Productivity Growth data is updated yearly, available from Dec 1992 to Dec 2019, averaging at 5.30 %. The data reached an all-time high of 9.74 % in Dec 2010 and a record low of 1.32 % in Dec 2002. To improve the Productivity and understand the scope of work & formula the strategy questionnaire survey ratings are essential with the help of which further solution will be developed. On collection of data analytical hierarchy process is used for evaluation of construction firms.

IndexTerms - Labour Productivity, Experience based Construction firms, human performance factor, Analytical hierarchy process.

I. INTRODUCTION

Construction is one of the country's biggest ventures of the world and has been assuming a critical part in financial improvement, and additionally in lessening unemployment. Profitability is one of the essential viewpoints for the organizations in the development business. Change in the efficiency of the development business is accordingly of basic significance thinking about its huge commitment to the GDP (Gross Domestic Product).

The construction company with the most efficient operations has a greater chance to make more money and deliver faster construction project to the project owner. Improving labor productivity can alleviate the shortage of skilled craft-workers, enhance the working conditions, and enhance the overall quality of a product. For every project, productivity, cost, quality and time have been the main concern. As appeared in Fig. 1, it is called "triple imperative". Here, labor productivity is a key halfway idea that can possibly influence these components and that ought to be considered in understanding the conceivable associations between them. Construction performance & productivity improvement are center regions in development industry for any country. Indian construction industry frames a necessary piece of economy. Construction constitutes 40% to half of India's capital consumption on ventures in different areas, for example, roadways, streets, railroads, vitality, airplane terminals, water system, and so forth and is the second biggest industry in India after farming. It represents around 8% of India's GDP. Improving productivity is significant worry for any benefit arranged association. When all is said in done terms productivity is named as ratio between input & output. Appropriate administration of accessible resource can help in enhancing productivity. Labor is the most imperative resource for a construction company. 30% to half of aggregate cost of venture is spent on labors. Nature of the development to a great extent relies on the nature of work done by labor. Labor productivity specifically influences development efficiency; it is essential to know the factors influencing work efficiency.

Numerous strategies have been produced and settled on accessible to leaders to streamline and encourage complex basic leadership exercises. At the point when chiefs expect to comprehend the relative estimation of an arrangement of options, in view of the proportion of picked up benefits over the execution cost, a Cost-Benefit Analysis is normally actualized. This strategy is appropriate for choice issues that involve the improvement of an utility capacity however has clear confinements when there are subjective parameters or when various targets are presented, as portrayed (Cascetta, et al, 2015). Multi-criteria choice investigation (MCDA) strategies have been created to help the basic leadership process in these more unpredictable cases. In the 1960, Bernard Roy built up the ELimination Et Choix Traduisant la REalite (ELECTRE) technique (Elimination and Choice Expressing Reality), in light of rankings and vetoes (Figueira, et al. 2013). Thomas Saaty built up the Analytical Hierarchy Process (AHP) in the next decade, getting need vectors from frameworks of pair wise examinations. The technique was first said in 1972 and a full portrayal of the model was given in 1980 (Saaty, 1980). In parallel, fluffy sets were first presented Bellman and Zadeh in the 1970 with an end goal to decipher subjective etymological articulations in scientific articulation (Zoraghi et al.2013) and the Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) was created by Hwang and Yoon in 1981 (Behzadian et al. 2012). In later advancements, Saaty (2005) proposed the Analytic Network Process (ANP). Conflictingly to AHP which accept reliance of the criteria, ANP represents the reliance that is intrinsic to the basic leadership factors. MCDA strategies have additionally been combined with agreement building systems, for example, the Delphi technique (Le Pira et al. 2016). Among these models, the Analytic Hierarchy Process constitutes a standout amongst the most examined and used MCDA strategies. AHP has been utilized in an assortment of

fields, to incorporate, among numerous others: open transportation arranging (Le Pira et al. 2016) , Cascetta et al. 2015) advertising and portfolio administration, shipping resources choice, military applications, the assessment of the natural effect of development ventures, sea life science and restorative applications (Forman and Gass,2001). As of late, there has been a discernible increment in the utilization of AHP for applications in mechanical and advanced plane design.

Variance in labor efficiency is caused by numerous subjective and quantitative components. Distinguishing these variables and evaluating the degree to which each might affect work efficiency is essential to all the more likely oversee work. Albeit, different viewpoints identified with work efficiency inside the development business have been archived, it stays to expressly distinguish a reasonable arrangement of components influencing work profitability mulling over the interrelated relationship among them. Improvement in construction labour productivity is not achievable without identifying factors influencing productivity. A lot of research has gone into identifying the factors that influence productivity in developed as well as developing nations. However little awareness exists regarding the factors affecting construction labour productivity in the Indian construction industry. However, many of labour now a day's do not concern about their productivity as long as they get payment on time but some of the labour become unproductive because of salary problems such as delay in payment, cut down of overtime payment and gain small salary by overloaded of work. Superior management should analyze this problems and give support to their workers by motivate them. Some of the worker become low productivity is because of their attitudes such as come late to work and going back early. The reason why they are not afraid to bring these bad attitudes to work is because of lack of supervision. Company shall have efficient labour productivity in order to become competitive and globalize

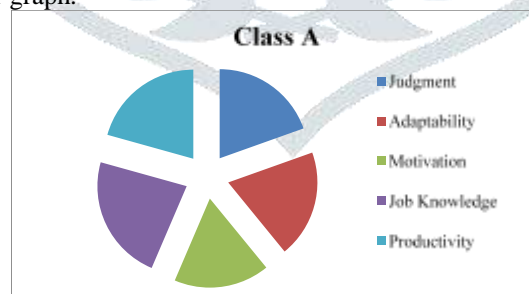
Identifying these factors and quantifying the extent to which each might have an impact on labour productivity is important to better manage labour. Although, various aspects related to labour productivity within the construction industry have been documented, it remains to explicitly identify a clear set of factors affecting labour productivity taking into consideration the interrelated relationship among them. With particular focus on construction sector in the area is confronted with many challenges, but one of critical impact is labour productivity. The aim of this research is, first, to identify significant factors influencing labour productivity in the construction sector from contractors' viewpoint and, second, to initiate the basis for labour productivity model using the Analytical Hierarchy Process.

OBJECTIVE OF STUDY:

- The main Aim of this work is to evaluate the effectiveness of human resource management in the Indian construction industry. The main queries that are addressed and evaluated in this study are:
- To investigate and discover the factors that influence human labor in various construction companies in the construction industry.
- Assessment of specific development firms in development industry utilizing Logical Ordered progression Cycle.
- To identify the most important factors that influence the labor productivity of typical India-based building and infrastructure projects.
- Establish benchmark indicators for performance based on productivity.
- To recommend the finding for further developing Expertise preparation phases, expectations for everyday comforts and word related schooling work efficiency in development projects.

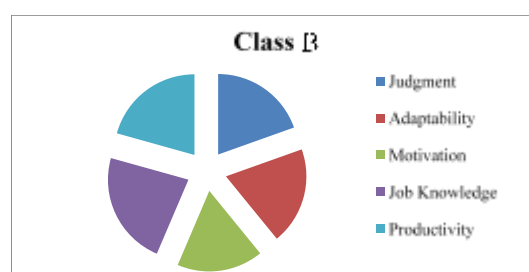
Results

In these chapter results of evaluation of construction firms using labor productivity factors are obtained. Contribution of each labor productivity factor in a specified class is denoted by a pie chart. Final score obtained after evaluation of construction firm using labor productivity factors is denoted by a bar graph.



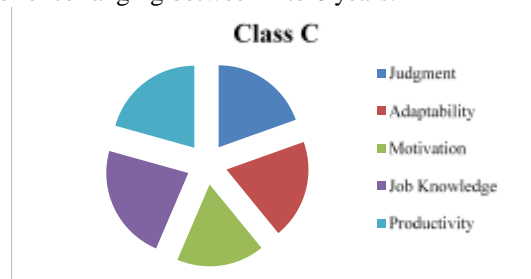
Ratings of Labor productivity Factor in Class A

Above Pie-Chart represents ratings of the labor productivity factors which were acquired through questionnaire survey from class A. Class A consisted firms which had experience up to 3 years.



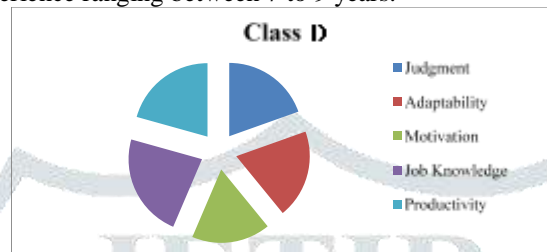
Ratings of Labor productivity Factor in Class B

Above Pie-Chart represents ratings of the labor productivity factors which were acquired through questionnaire survey from class B. Class B consisted firms which had experience ranging between 4 to 6 years.



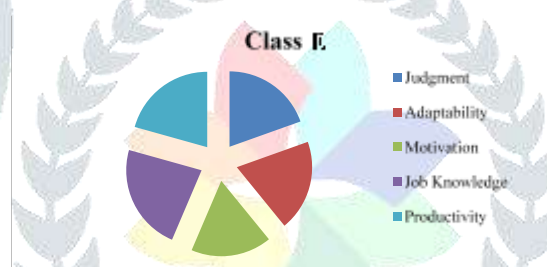
Ratings of Labor productivity Factor in Class C

Above Pie-Chart represents ratings of the labor productivity factors which were acquired through questionnaire survey from class C. Class C consisted firms which had experience ranging between 7 to 9 years.



Ratings of Labor productivity Factor in Class D

Above Pie-Chart represents ratings of the labor productivity factors which were acquired through questionnaire survey from class D. Class D consisted firms which had experience ranging between 10 to 12 years.



Ratings of Labor productivity Factor in Class E

Above Pie-Chart represents ratings of the labor productivity factors which were acquired through questionnaire survey from class E. Class E consisted firms which had experience more than 12 years.

Table: Total ratings of labour productivity factors in classes.

Factors	Class A	Class B	Class C	Class D	Class E
Judgement	35	39	41	34	44
Adaptability	35	38	40	30	37
Motivation	31	38	43	33	46
Job Knowledge	41	40	46	38	49
Productivity	37	43	41	36	46

Result obtained from Evaluation of Construction Classes

Classes	Score
Class A	0.123
Class B	0.166
Class C	0.177
Class D	0.185
Class E	0.346

Discussion

According to analysis by analytical hierarchy process and its results corresponding construction firm is selected. Following are the results discussed from table no. 3 & 4.

Productivity and job knowledge are the most common in Class A. Both adaptability and judgment receive equal ratings. Class A, on the other hand, has up to three years of experience, so motivation has the lowest percentage of all other factors.

Productivity ranks highest in Class B, followed by Job Knowledge. Job Knowledge is followed by judgment. The lowest proportion of Class B students with experience ranging from four to six years is rated equally for adaptability and motivation.

Motivation comes in second, followed by Job Knowledge, in Class C. Both judgment and productivity are rated equally and follow Motivation. Class C firms have an average of 7 to 9 years of experience, making adaptability the lowest of all other factors.

Productivity and job knowledge are the most common in Class D. Judgment is supporter of efficiency. Motivation is a judge's follower. The lowest percentage of all other factors is adaptability in Class D. A Class C company has 10 to 12 years of experience. Class E has the highest percentage of Job Knowledge, followed by equal ratings for Motivation and Productivity. Motivation and productivity lead judgment. In Class E, adaptability ranks lowest out of all the other factors. A Class C company has been in business for more than 12 years.

The overall Job Knowledge factor receives the highest ratings across all classes, according to the analysis. In all classes, adaptability receives the lowest rating. Among all other factors, job experience ranks highest.

The term "job knowledge" typically refers to a set of skills or responsibilities for a specific job, as well as corrective measures like shifting responsibilities and rewriting the job description.

Among these five factors affecting human performance, adaptability is the least influential. Individuals with adaptability are able to proactively adapt to shifting career circumstances, so adaptability has little effect on productivity.

Class E, the most satisfying labor productivity factor, received the highest score in the analytical hierarchy process for evaluating construction firms.

Class D scored higher than Class E. The score for Class C was next. The score for Class B came in second. Class A received the lowest score of all the classes, falling behind Class B.

The findings indicate that a company's experience and labor productivity factor play a significant role in construction firm evaluation.

CONCLUSION

Construction labors are migratory in nature which makes them keeps on changing jobs without developing any long-term relationship with a firm. Especially in early stages decision making is the most important activity in the development of construction firms. Based on such activities Adaptability, Job Knowledge, Judgment, Motivation, Productivity are the labor productivity factors derived from the study.

The results after the application of AHP in the study was used to determine the factors affecting productivity and selection of best construction firm based on their experience. Job Knowledge is highly rated by all classes and proves to be the most important factor which firms consider in labor productivity among all other factors. Class A gave more importance to Job Knowledge and gave least importance to Motivation. Class B gave more importance to Productivity and gave least importance to Adaptability and Motivation. Classes which are highly experienced gave more importance to Job Knowledge, while Adaptability was given least importance. Class E emerges to be the best class as it scored the highest in analytical hierarchy process evaluation. It was followed by Class D, then Class C, then Class B and finally Class A. These factors has an impact on labour productivity by 35% more on Class A then Class E.

Thus, experience plays a vital role in construction industry as firms which are highly experienced scored more compared to firms which possess less experience. Efficient staffing can be carried out in construction firms based on the results. These would help the firms to maximize their productivity through employees. This will facilitate smooth functioning of the firms and will help firms to set a new benchmark.