

A Review on Analysis of Labour Productivity for Building Construction Industry

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Abstract— Construction project contractors are seeking for ways to reduce waste and boost profitability because profit margins are always narrowing and competition is growing. The use of statistical techniques holds the potential of minimising, if not completely eliminating, non-value-added activity, despite the fact that numerous strategies have been created to increase the efficacy and efficiency of the construction process. One of the most important businesses in every economy is construction. It makes a sizable contribution to the national economy and employs a sizable number of people. The scientific study of the conservation of human resources in the quest for the most effective way to complete a task is known as time and motion study (sometimes known as motion and time studies; the phrases are interchangeable). Time and motion studies are conducted to assess human efficiency through improved planning and reliable employee incentive schemes

Index Terms - Labour productivity,time motion,work study,regression analysis

I. INTRODUCTION

Labour profitability is a crucial financial metric that is closely related to monetary trends, assertiveness, and expectations of general economic comfort. The term "labour efficiency" refers to the total amount of income delivered per unit of work (measured as the number of employed people) for a specific time reference period (also known as "gross domestic product," or GDP). Marker provides general information on the effectiveness and makeup of human capital in the process of creation for a specific financial and social environment, as well as other correlative data. Information clients are able to evaluate the levels of GDP inputs to work and the rate of development after a certain amount of time. sources of knowledge and current developments. It was one of the indicators used to measure progress towards

reaching the Millennium Development Goals (MDGs), specifically Goal 1 (eradicate poverty), due to its skill in expressing important data on the circumstances of the country's work sample. Goal 8 of the Sustainable Development Goals (SDGs) (support sustainable, comprehensive, and sound monetary development, full and profitable entrepreneurship, and not too bad work for everybody) includes this as one of the indicators to gauge progress towards attaining the goal. The two main focuses of any nation's development sector are carrying out development and boosting profitability. India's growing industry is a vital component of the country's economy. The second largest industry in India after agribusiness, development generates 40% to 50% of the country's capital consumption for enterprises in a variety of sectors including motorways, streets, trains, vitality, air terminals, water system, etc. The GDP of India is made up of around 11% of it. Any negotiated benefits association is very concerned with increasing efficiency. The ratio of information to yield is generally referred to as efficiency. Efficiency can be increased with proper resource management. The most valuable resource for a development organisation is labour.

II. LITERATURE REVIEW

Paul Chan (2002) Much research in the territory of development efficiency concentrated on the variables Affecting work. In any case, these examinations will in general take a gander at the variables in confinement and in this way were deficient in the proposals for efficiency upgrades. This is on the grounds that work profitability is a perplexing and multifaceted issue. Given the ongoing mechanical activities of Rethinking Construction and Respect for People, it is turning into a perpetually significant plan to comprehend the

workforce. This investigation, some portion of a Ph.D. investigation into development work efficiency, endeavors to decide how the site the board faculty sees the idea of development work profitability and to evoke key factors that would prompt enhancements. These recognitions are investigated by drawing in with the individual develops of the members through center gathering interviews. The discoveries recommend a more prominent accentuation on four key parts of arranging, cooperation, welfare and professional stability.

Mr. Sujay Biswas (2016) This paper centers around the pivotal side of efficiency improvement with the best possible utilization of work study method joined with movement and time study in the exercises of the assembling endeavors. The work study procedure idea is utilized by the undertakings to decrease work in progress inventories and furthermore to reduce the misuse of accessible assets like man, machine, materials, space, and so on to reach in the aggressive worldwide market. In the present world, quality with amount is the primary methodology for an industry to hold its reality in the aggressive market. Since, the strategy of work study is particularly required for the executives to comprehend its genuine application not just from edge of profitability/money related improvement or appropriate use of asset, yet in addition should address fundamentally the delicate side of laborers brain science.

Aparna. B (2015) Cementing is one of the costly components in development ventures. Work cost represents a significant offer in the all about undertaking cost alongside the expense of materials and hardware. Workers are the most unique component in the development business and records for 30 to half of the absolute development cost. Consequently, it is basic to distinguish the significant elements affecting work efficiency and its impacts on work profitability. Information gathered from four distinctive building locales were considered in this examination. A multivariate straight relapse investigation was utilized to recognize the impacts of measurably noteworthy parameters on work profitability. The investigation shows that talented workers, over keeping an eye on, day by day installment, unpredictability of structure and age bunch between 30 - 50 expands the profitability of

machine blending - man move cementing system of sections. Essentially work profitability was found to diminish with female specialist, higher floor number, local speaker, correspondence issue and evening work hours.

Mahesh K.S (2017) The most testing issue in Construction industry is to improving the creation effectiveness. India is a developing economy. It is assessed to be the third biggest economy by 2050. Foundation development is a venturing stone of a steady and profitable society, it presents one of a kind difficulties yet additionally brings open doors for private and open parts in the field of development. Improvement will prompt enormous development and there will be a positive development in businesses identified with development. Reports additionally recommend that the upward pattern has been seen by these parts. The point of this paper is to distinguish factors influencing work profitability in building development ventures. A writing survey and factors prescribed by specialists are considered to sort the variables and dissected. This investigation reports the consequences of a poll review of task directors, site architects, chiefs and skilled workers, in India, to recognize the elements affecting development work efficiency.

Nithya C Joseph (2017) In the field of development, Construction work profitability is a basic factor to the achievement of the business. It is in this manner, significant for the estimation and planning of development venture. A significant part of our India's GDP establishes by the development business. Accordingly factors improving profitability of this area is extremely significant. 30% to 40% of the absolute task cost is devoured by the works. Thus factors influencing work efficiency are a lot of significant and should give more consideration. In this situation factors influencing work profitability is progressively legitimate. Appraisal and anticipation of disappointments of development ventures concentrated on schedule, cost and quality is a pivotal factor that is continually upsetting the development business. Indeed, even those components are expanding each year. In this situation it is critical to investigation recognize and understand the variables. In this article the variables affecting work profitability are recognized from various articles to rank them

utilizing the RII strategy and furthermore by utilizing SPSS programming so as to propose some viable proposals to illuminate this issue and therefore to improve efficiency

Patange Vidyut Chandra (2013) Efficiency is the connection among yield and information. It really implies increasing the value of contribution to upgrade estimation of yield. Efficiency can be accomplished by upgrading the worth included substance of items/administrations, or by diminishing the unit cost of generation, or a blend of both (Erlendsson, J. 2006). At present all procedure is considered from the edge of profitability to decrease the non-esteem exercises to give streamlined yield to the conceivable degree. It is an all-out idea that tends to the key components of rivalry, for instance is development, cost, quality and conveyance This paper centers around the vital region of efficiency improvement with the keen utilization of work study method blended in with present day delicate abilities. . The executives needs to comprehend its application not simply from edge of generation improvement or fund improvement or asset use, yet additionally should address fundamentally the delicate side of laborers brain research to give the best to for tolerating the efficiency arrangements, yet in addition be a section on bleeding edge during genuine usage to make the investigation extremely worth its time and exertion.

Nguyen Van Tam (2018) Work profitability of Vietnamese economy by and large and of Vietnamese development industry specifically is low in correlation with different nations. Boosting work efficiency is turning out to be desperation and is drawing in a lot of consideration from both local and outside scientists. This paper centers around a progression of components influencing work efficiency on building site in Hanoi. The exploration means to assess and rate the degree of effect of each factor to work profitability. By alluding to the results of this examination, Vietnamese development temporary workers will have the option to concoct useful arrangements which will contribute towards a superior exhibition of development laborers. On that premise, the efficiency of development firms and national economy will be improved correspondingly.

Paul TY Preenen (2015) This article creates and

inspects the possibility that interior work adaptability rehearses are helpful for work efficiency and development execution of organizations. This is tried in two examinations utilizing remarkable organization level datasets. In Study 1, results acquired from 377 free organizations uncovered that inner work adaptability rehearses are decidedly identified with target work efficiency and its development in the year following, additionally when controlled for target work profitability and target outside work adaptability from the prior year. In Study 2, results got from 4271 organizations showed that interior work adaptability rehearses were emphatically identified with item advancement and work profitability. Discoveries propose that inside work adaptability rehearses advantage both work profitability and advancement execution of organizations. In the event that development and work profitability are viewed as key to long haul endurance, firms and policymakers ought to consider inside work adaptability rehearses.

Nasiru Zakari Muhammad (2015) Development work profitability is basic to the achievement of the business. It is therefore, significant for the estimation and planning of development venture. Be that as it may, the majority of the conventional development firms have no exact information on work efficiency. Subsequently, this paper expects to recognize through writing survey those components that influence work creation rate and assess their impacts on the exhibition of the business. The examination utilized the 44 returned surveys from the contractual workers firms. Measurable bundle for sociologies (SPSS) to process the mean score for each factor. These variables were in this way positioned dependent on the mean score esteem. The consequences of the examination has indicated that, in light of the administration level variables "absence of inspiration and motivation, absence of gear, disturbance of intensity and water supply and investigation delay" are the most noteworthy components influencing work efficiency each with mean score estimations of 0.79, 0.44, 0.38 and 0.35 individually. Additionally dependent on the site level variables "absence of satisfactory capable specialist with explicit scope of work" on site, delay in stock of material, climate, access to site, group size and correspondence issues among outside and nearby staff are the best six most critical elements influencing work efficiency each with the mean score estimations

of 0.77, 0.75, 0.75, 0.66, 0.61 and 0.53 individually. Also, every one of the respondents appear to have concurred in their discernment on the seriousness of elements influencing work profitability.

Brent G. Hickson (2014) Work efficiency is at the front line of concerns confronting experts in the development business around the world. In spite of the leaps forward made in innovation and a consistently extending work showcase a great part of the advances in development are being disintegrated by intrinsically poor practices hands on location. This investigation features the elements influencing work profitability of the Construction business in Trinidad and Tobago (T&T). A poll was utilized to accumulate the pertinent information from individuals from the Trinidad and Tobago Contractors Association. It included positioning 42 predefined factors separated into 4 classes: Management; Technological; Human/Labor and External. The general significance of records (RII) was resolved and the elements were positioned. The best ten variables influencing development work profitability in T&T are: the absence of work supervision, ridiculous planning and desire for work execution, deficiency of experienced work, development administrator's absence of authority aptitudes, range of abilities of workers, delay in reacting to demands for data (RFI), instalment delay, correspondence issues between site the board and work, downpour and late appearance, early stopping, and regular unscheduled breaks. Suggestions have been made in the investigation to address these variables. The exploration has direct advantages to enter partners in the development business.

Prachi R. Ghate (2016) Profitability is a significant part of development industry that might be utilized as a file for effectiveness of creation. Effective administration of development assets can prompt higher efficiency which can accomplish cost and efficient. Development is work arranged industry. It intensely depends on the aptitudes of its workforce. The work is industry's most significant resource. It is critical to improve effectiveness of creation by improving profitability of work. Diminishing efficiency of task has consistently been significant worry for development Industry. Point of this venture is to contemplate the significance of estimation of work profitability in development industry around

Mumbai area in the wake of finding the variables influencing work efficiency. Variables influencing work efficiency were investigated utilizing RII technique. Estimation of work profitability is finished utilizing work study technique. RII strategy uncovered top ten positioned factors which influence work efficiency. The information assortment is finished by work study strategy shows talented work as profoundly significant factor influencing work profitability. From the investigation of information gathered it is seen that estimation of work efficiency is useful in sparing the hour of the undertaking just as cost of task without hampering the nature of work.

Mr. C. Thiyagu (2015) The most testing issue in Construction industry is to improving the generation proficiency. Many research have been done before, anyway a more profound comprehension is as yet expected to improve the work efficiency. The primary result from the writing is that there is no standard meaning of profitability. It covers the development work efficiency definitions, angles, factors influencing it. The profitability of work is especially significant particularly in creating nations, where the vast majority of the structure development work is still on manual premise. The point of this examination is to get the most recent data and to distinguish the key factors that influence the work efficiency in and around Coimbatore. So overview is helped out through survey and circulate to respondents who work at different ventures in wide zone in Coimbatore and the polls are appraised by venture chiefs, experienced architects and In addition, information is collected and examined; utilizing this the influenced elements are recognized and positioned, through this important advances are given to improve the work efficiency.

Anthea Savidis This paper discusses the unique nature of the construction industry, focussing on the use of labour productivity. Comparisons and parallels between construction and other sectors of the economy are highlighted. In addition, the Australian construction industry is compared to the industries in the USA and UK. Various methods of measuring construction productivity are discussed, including, working conditions, incentives and their relationship with labour productivity. Possible links between employment levels in the construction industry expenditure are also examined. According to there are

few technical issues which generate more muddled thinking than “productivity”. While there seems to be a general agreement that “high productivity” is a good thing there it is far less clear how productivity should be defined or measured. For instance, research by demonstrates that the productivity in all the construction industries of developed countries is lower than the productivity levels of developing countries. This is thought to be due to the fact that rapid changes in technology and business operations have resulted in fast obsolescence of existing building stock. As a result the requirement to renew old buildings has had an impact on productivity levels because refurbishing is more labour intensive than new construction work.

Ponmalar V (2018) The construction sector is diverse as it contains contractors, consultants, designers, owners and others. Poor productivity of construction workers is one of the causes of cost and time overruns in construction projects. As construction is a labour-intensive industry, this paper focuses on labour productivity in the construction industry and to identify factors affecting labour productivity at building construction project. The performance of labour is affected by many factors and is usually linked to the performance of time, cost, work pressure, safety measures and quality. The questionnaires were distributed to supervisors, project Engineer, labourers, the top 35 factors were identified, categorized into 3 different groups, using SPSS tool, which is analytical software, the factors were analyzed and ranked considering relative importance index were calculated. And also calculated actual productivity for Brick Masonry is taken from sites. The result shows the factors considered which most affects the labour productivity loss in residential buildings and actual productivity versus expected productivity the brick masonry work were calculated.

Dharani K (2015) Productivity remains an intriguing subject and a dominant issue in the construction sector, promising cost savings and efficient usage of resources. Productivity is one of the most important issues in both developed and developing countries. The developed countries are aware of the importance of economic growth and social welfare. The developing countries which face unemployment problems, inflation and resource scarcity seek to utilise resources and in such a way as to achieve economic growth and improve citizens lives. The aim

of this thesis is to identify factors which are affecting labour productivity and also to study causes i.e. labour problems on site and its effects on the construction projects. Some of the important factors affecting labour productivity are: quality of site management, labour experience, misunderstandings between labour and superintendent etc. The problems faced by the labour on Indian construction sites are dealt with in detail. Problems like non-availability of proper accommodation, basic amenities, low wages, safety related problems etc. dominate on almost all Indian construction sites. The small firms in India are not able to fulfilllabours requirements, and that is why labour is not able to raise their productivity. In fact it is found that actual labour productivity ratios are reducing day by day, which in turns harms organization’s profitability. In this study we will try to relate the ill effects of falling labour productivity with the productivity of other resources such as material, equipment and capital. This thesis restricts itself to the survey and research in the Indian context. Analysis of obtained data was done using different statistical methods.

CONCLUSION

- factors affecting labour productivity are Labour Supervision, Skilled Labour, Scheduling of work, Training of labour, Payment, Communication between site management and labour, Climatic condition, Expectations out of labour performance, Unscheduled extra work, Construction method, Availability of material, Availability of tools, Numbers of labours on site, Temperature on site, Safety conditions on site, Meetings with labour contractor, Motivation to labour, Project manager’s leadership, Miscommunication between site management
- Factors influencing work efficiency are a lot of significant and should give more consideration.
- In this situation factors influencing work profitability is progressively.
- Understanding factors affecting productivity of both positive and negative can be used to prepare a strategy to reduce inefficiencies and to improve the effectiveness of project performance.

- Knowledge and understanding of the various factors affecting construction labour productivity is needed to decide the focus of the necessary steps in an effort to reduce project cost overrun and project completion delay, thereby increasing productivity and overall project performance.

FURTHER WORK

To improve the productivity by using the correlation and regression method and detect the cause of low productivity. It is difficult to note down the working time of labor's on each activity simultaneously. In this project 3 to 4 case study of building is proposed for sampling for construction activities for average 7 labours 7 days per activity. Concreting is selected.



Fig 1. Flow of Work

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