



A REVIEW ON SYSTEM DEVELOPMENT: A COLLABORATIVE APPROACH FOR RESOLVING ISSUES IN SUBCONTRACTING MANAGEMENT

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Abstract: This paper aims to provide a solution to resolve issues in subcontracting management by developing computer based system. This system will help improve relation between contractor and subcontractor. These computer based program will have daily project tracking, daily work done by subcontractors, amount to be paid to the subcontractor depending on work done, quality of work can be known.

Index Terms - Subcontractor, Contractor, and Computer based system.

I. INTRODUCTION

Construction projects have so much complexity and in those, raw materials, equipment's, technology, finance and the most important of all human resource are involved. Construction projects involve many parties like client, contractor, consultants, suppliers, subcontractors and so forth. The contractors normally sublet the work to the subcontractors for transform the risks. Subcontractors are specialist people who are doing their work with core competences, efficiency and completion in a timely by execution, supplying manpower, tools, equipment and designs.

A subcontractor is a construction firm that contracts with a general contractor to perform some aspect of the general contractor's work. In the usual case, the general contractor will perform the basic operations and subcontract the remainder to various specialty contractors. Subcontracting is used much more extensively on housing and building construction projects than on engineering and industrial projects.

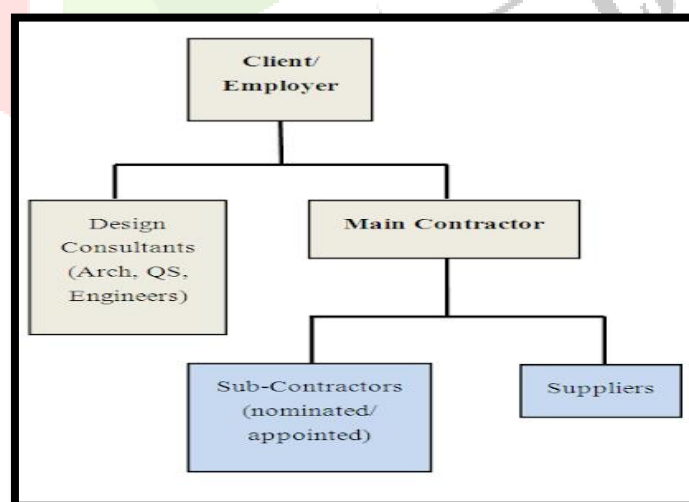


Fig 1: Flow chart showing nomination of subcontractor

II. LITERATURE SURVEY

“Causes of delay in large construction projects” International Journal of Project Management (2006). Sadi A. Assaf , Sadiq Al-Hejji:-

This paper presents a survey on time performance of different types of construction projects in Saudi Arabia was conducted to determine the causes of delay and their importance according to each of the project participants, i.e., the owner, consultant and the contractor. The field survey conducted included 23 contractors, 19 consultants, and 15 owners. Seventy-three causes of delay were identified during the research. 76% of the contractors and 56% of the consultants indicated that average of time overrun is between 10% and 30% of the original duration. The most common cause of delay identified by all the three parties is “change order”. Surveys concluded that 70% of projects experienced time overrun and found that 45 out of 76 projects considered were delayed.

“Subcontracting and its ramifications: A survey of the building industry in Hong Kong” International Journal of Project Management (2009) Yat-Hung Chiang:-

The paper presents that there has been increasing concern on excessive subcontracting. This study reviews the case of Hong Kong, in particular the consequence of high & growing rate of subcontracting and what project managers can do. Based on statistics and elemental cost analyses, paper finds that as much as 80% of the value of building works is undertaken by small subcontractors. Whilst subcontracting provides the industry with specialized services as well as organizational and managerial flexibility, it has also been attributed to the labor intensity and the lackluster performance of the industry. It relies on project managers to make the best use of what subcontracting has to offer, whilst avoiding its pitfalls. An assessment of the extent and issues of subcontracting helps us understand how project management could enhance the performance of the projects and then the industry.

“A cost control system development”: A collaborative approach for small and medium-sized contractors International Journal of Project Management (2009) Vacharapoom Benjaoran:-

The paper aims at construction business comprises a number of small and medium-sized contractors which form the major part of the industry. The existing research on the new ICT development is creating very sophisticated and complex systems which are not yet applicable to this part of the construction industry. With regard to general limitations as design criteria, this research uses a collaborative approach to develop a cost control system for five selected small and-medium-sized contractors. The new efficient cost control system is adopted on the earned value concept and is developed using available ICT tools which are familiar and easy-to-learn. A collaborative approach can ensure the diffusion of technology to these companies.

“Fundamental Principles of Subcontractor Management” American Society of Civil Engineering (2011) H. Randolph Thomas, Christopher J. Flynn:-

This paper describes the results of a study to develop fundamental principles of subcontract management. Fundamental principles are actions a general contractor can take to improve job performance. In developing the principles, there was significant interaction with industry professionals. The principles are organized into two broad groupings: managing people and managing the subcontractor's work. There are a total of 21 principles listed. These are easy to comprehend and implement. If implemented, they will likely yield immediate and positive results.

“Subcontractor Evaluation and Management Framework for Strategic Partnering” American Society of Civil Engineering (2008) Creed S. J. Eom, Seok H. Yun Joon H. Paek:-

The paper aims at main contractors have shifted their attitudes about subcontract procurement to more strategic and long-term partnering philosophies. The objective of this paper was to present a framework for subcontractor evaluation and management to help main contractors develop more strategic and productive relationships with their subcontract partners. As the strategic performance feedback model, the balanced scorecard concept was adopted with modification. A case study was also conducted to evaluate the framework with subcontracting strategy, performance indexes, weighting, evaluation of subcontractor performance data, and feedback methods. The research results obtained can be useful as a guideline of subcontractor management for long-term partnering and also to enhance overall productivity within the construction supply chain.

“Subcontractor Schedule Control Method” American Society of Civil Engineering (2007) Carrie Sturts Dossick, P.E., Timothy K. Schunk:-

The paper tells us that trade coordination and claims documentation is a challenge on any project, particularly for specialty subcontractors. The writers introduce a schedule control method initiated by the subcontractor, which facilitates coordination and communication between a subcontractor and other project participants as well as documentation to the prime contractor. A case study illustrates the preparation of a trade-specific critical path method _CPM_ schedule, which is updated on a regular basis. The writers also address the interrelationship between the CPM schedule, internal reporting, schedule of values, and labor tracking. It is difficult to ensure that all subcontractor produced documentation is complementary, but it is well worth the effort when it comes to supporting a claim. Monthly schedule updates and narratives communicate the conflicts, issues, and schedule constraints the subcontractor experiences or anticipate on a project, thereby providing contractually required notice to the prime contractor during the project. This increases the likelihood of resolving issues during the project, while simultaneously protecting a subcontractor's position if change order requests are denied or if back charges are levied prompting a subcontractor to enforce its rights, execute a claim, or proceed to litigation.

“Construction delay: a quantitative analysis” International Journal of Project Management (2012) Ayman H. Al-Momani:-

Avoiding construction claims and disputes requires an understanding of the contractual terms and causes of claims. The dual underlying theme of this paper is to investigate the causes of delays on 130 public projects in Jordan and to aid construction managers in establishing adequate evaluation prior to the contract award using quantitative data. Projects investigated in this study included residential, office and administration buildings, school buildings, medical centers and communication facilities. Results of this study indicates the main causes of delay in construction of public projects relate to designers, user changes, weather, site conditions, late deliveries, economic conditions and increase in quantity. The presences of these factors have an impact on the successful completion of the projects at the time contractually specified. The endings suggest that special attention to factors identified in this study will help industry practitioners in minimizing the risk of contract disputes.

“Issues in Subcontracting Management in residential projects” Journal of Civil Engineering and Environmental Technology (2017) Asmita Sidram Koli:-

The paper aims at telling us that subcontractors are very important for successful completion of construction projects, yet many issues arises in subcontracting management .The objective of this paper is to examine and study issues in subcontracting management in residential projects. After an extensive literature study through the articles in various journals, research papers and books, a research gap has been identified. Based on the finding of research gap, suitable research problem has been formulated. The research design will include the collection of primary data i.e. by floating a questionnaire and secondary data i.e. the literature study. The primary data has been collected by administering a questionnaire to the organizations engaged in carrying out residential projects in Pune. Data analysis and data interpretation has been done using statistical tools. The results obtained have been used for testing the research problem and the findings of the same have been recorded. Based on the findings, necessary conclusions and recommendations have been drawn, highlighting the factors that will have a crucial impact on the selection and engagement of subcontractors in residential projects.

“Issues in Subcontracting Practice” American Society of Civil Engineers (2005) David Arditi and Ranon Chotibhongs:-

The paper tells us that subcontractors are very important to the successful completion of most construction projects, yet the many issues involved in subcontracting practice are seldom acknowledged. A literature review indicates that these issues include the timeliness of payments by general contractors, the process of selecting subcontractors, subcontractor bonding, construction insurance, safety issues on the construction site, partnering arrangements with various parties, and productivity issues. A questionnaire survey was administered to subcontractors, general contractors, and construction owners to investigate these issues and to determine the differences in perceptions between the parties. The results confirm the existence of the issues identified in the literature and in addition indicate that ~1! The practice of retainage withheld by general contractors seems to be acceptable to many subcontractors unless its magnitude is large relative to the size of the firm; ~2! Post award bid shopping by general contractors is sometimes justified, particularly in cases where the scope of subcontract work is modified; and ~3! Current bonding and insurance practices are adequate unless the additional transferred risks are excessive. Recommendations are made on the basis of the findings to minimize the negative effects of said issues.

“The contractor-subcontractor relationship: The subcontractor's view “American Society of Civil Engineering (1994) by Jimmie Hinze, Andrew Tracey:-

In the construction of most projects, a significant role is played by specialty contractors, also commonly referred to as subcontractors. Despite the importance of subcontractors, little is publicized about the actual process by which subcontracts are initiated, how award arrangements are made, or how subcontracts are managed. An exploratory study was conducted that focused on this subject. Information was obtained on bidding practices, subcontracting arrangements, administrative practices, payment procedures, and project closeout. The results provide information on various methods used by general contractors to place subcontractors at risk. Bid shopping appears to be a continuing practice in the construction industry, with little recourse for subcontractors. Subcontractors are often contractually required to assume risks that they would not otherwise assume. They are often required to assume all the obligations as stipulated in the contract between the owner and the general contractor, but are not afforded the opportunity to examine it.

III. CONCLUSION

As per the research, following major factors were identified which were the main reasons due to which conflicts arise between contractor and subcontractor which causes delay in projects leading to time and cost overrun.

- **Delays of Work**

All parties involved in the construction process (i.e., owners, contractors, subcontractors and suppliers) have a vested interest in on-time performance and on-time payment. Construction projects involve expensive equipment, tremendous overhead, significant manpower and large payrolls for owners and contractors alike. Due to the high costs of untimely performance, contractors and owners usually require well planned and often complex schedules. Contractors commonly use completion date, bar chart and percentage of completion schedules to check progress, synchronize subcontractors and record delays. Owners may require more refined scheduling methods.

- **Neglecting Safety Measures**

Construction is one of the important industries employing a huge number of people on its workforce. A large range of activities are involved in it. Due to the advent of Industrialization and recent developments, this industry is taking a pivotal role for construction of buildings, roads, bridges, power projects and so forth. The workers engaged in this industry are victims of different occupational disorders as well as psychosocial stresses. In India, they are considered in organized and unorganized sectors. It is true that a sizable number of the workforce is from the unorganized sectors —

The working hours are more than the required hours of work — the work place is not proper — the working conditions are not suitable in most of the cases and involve risk factors. Their wages are also not sufficient, making it difficult for them to run their families. The hazards include handling of different materials required for construction, and exposure to adverse environmental conditions. On account of this, in adverse conditions, it results in accidents and adverse health conditions cause psychosocial strain and the like. They are victims of headache, backache, joint pains, skin diseases, lung disorders, other muscular skeletal disorders, and so on. The repetitive nature of the work causes boredom and the less earning compared to the requirements puts them under psychological stress and strain and other behavioral disorders. The Government of India has realized the importance of this industry and has promulgated an Act in 1996. The state government is being asked to adhere to this, still only a few states have partially imposed it. In this article, attempts have been made to review some of the important available articles for giving a brief idea of the problem.

- **Scope of work not defined properly**

This is one of the major causes in delay of work by the client. Most of the time due to non-availability of funds or national slump in economy, change in company policy, etc. the client is left with only one way i.e. none other than to change to reduce the scope of work. During this process lot of changes takes place in drawings and specification which directly or indirectly delays the execution of projects. The changing scope of projects is known as 'Scope Creep' which means continuous growth or change in scope of a particular project beyond its original stated intent. Managers of all construction related firms encounter this problem every time a client demands. This scope creep many times leads to double or triple the workload of contractor.

- **Low productivity of labour**

The main factor now a day's construction industry is facing are declining rate of productivity and lack of productivity standards. There are various factors which causes the low labor productivity. These factors could be classified as;

1. Industry Related Factors
2. Management Related Factors
3. Labor Related Factors

Industry related factors are such as design factor, building codes, construction technology, laws and regulations, job factors (job duration, size and type of job), adverse, uncertain weather and seasonality and site location. Management related factors are such as change in upper level of management, change in policies, and change in organizational structure, etc. Labor related factors are such as personal issues of labor, lack of knowledge, inappropriate site conditions, fatigue, occupational deceases, safety issues, etc.

- **Poor Quality of work by subcontractor**

Poor construction methods and workmanship is mainly responsible for the failure of buildings and structures. It is caused due to ignorance and inadequate quality control at construction site. The effects of some of the poor construction methods are: Incorrectly made construction joints, grout leakage, poor compaction, segregation, too high a water content.

Poor quality of work is done by subcontractors are divided

Into three main categories:

1. Technical related causes
2. Management system related causes

- **Staffing related causes**

Technical related causes occurs due to insufficient technical support from head office, poor temporary work design, insufficient site office space, poor site layout, poor project program or phasing of work. Management related causes occur due to unclear job duties, unclear communication path, and insufficient authority for frontline staff, unclear accountability system, and too much paper work. Staffing related causes occurs due to frequent change of personnel, staff inexperience to coordinate technical administration work, staff inexperience to carry out site work, insufficient staff to carry out the work.

- **Shortage of skilled labour**

Some of the contractors do not have skilled labour in proportion which is required as a result of that quality of work is not up to mark. Shortage of skilled labour heavily affects the productivity.

REFERENCES

- [1] Causes of delay in large construction projects” International Journal of Project Management (2006). Sadi A. Assaf , Sadiq Al-Hejji.
- [2] Subcontracting and its ramifications: A survey of the building industry in Hong Kong” International Journal of Project Management (2009) Yat-Hung Chiang.
- [3] A cost control system development”: A collaborative approach for small and medium-sized contractors International Journal of Project Management (2009) Vacharapoom Benjaoran.
- [4] Fundamental Principles of Subcontractor Management” American Society of Civil Engineering (2011) H. Randolph Thomas, Christopher J. Flynn.
- [5] Subcontractor Evaluation and Management Framework for Strategic Partnering” American Society of Civil Engineering (2008) Creed S. J. Eom, Seok H. Yun Joon H. Paek.
- [6] Subcontractor Schedule Control Method” American Society of Civil Engineering (2007) Carrie Sturts Dossick, P.E., Timothy K. Schunk.
- [7] Construction delay: a quantitative analysis” International Journal of Project Management (2012) Ayman H. Al-Momani.
- [8] Issues in Subcontracting Management in residential projects” Journal of Civil Engineering and Environmental Technology (2017) Asmita Sidram Koli.
- [9] Subcontractor Schedule Control Method” American Society of Civil Engineering (2007) Carrie Sturts Dossick, P.E., Timothy K. Schunk.
- [10] The contractor-subcontractor relationship: The subcontractor's view “ American Society of Civil Engineering (1994) by jimmie hinze, andrew tracey.

