

## AN ANALYTICAL STUDY OF THE KEY BARRIERS IN CONSTRUCTION PROJECT COORDINATION

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### Abstract

The complexity of the nature of construction makes it one of the most adverse businesses that has ever existed. Construction projects have often suffered from high fragmentation, large waste, poor productivity, cost and time overruns, and conflicts and disputes for a long time. Thus, many new and innovative management systems in construction are introduced such as partnering, joint venture, alliances, supply chain management, enterprise resource planning, just in time and total quality management to meet these challenges. However, these construction management systems are nothing without coordination, a vital management principle and activity, which provides best cooperation among team members. Although coordination plays crucial functions throughout the building process especially during the design and construction stages, some failures in construction projects adopting coordination principles are still observed. Hence, a study is carried out to investigate the key barriers of coordination in construction project. Through the literature review, five groups of key barriers including the nature of construction, traditional contract agreement, construction participants, characteristics of organization and the management approach are grouped. A detailed study is carried out by collecting data and analyzing them. Suggestions are given to better implementation of the management principles.

### 1.INTRODUCTION

The construction industry generally represents a considerable percentage of profit in our country, but the productivity of this industry is lower than most other industries. Construction industry covers a wide range of projects and every construction project is unique in nature as it involves myriads of interrelated activities, tasks and work packages (Chris, 2009). With these complexities, construction is observed as the most adverse business among many industries. Therefore, construction projects

have commonly suffered from high fragmentation, large waste, poor productivity, cost and time overruns as well as enduring conflicts and disputes.

Coordination is an important function in the building process. Nevertheless, many authors of textbooks on construction project management have not discussed this vital topic. A question emerged is: "What are the key barriers in employing coordination in construction?". Therefore, a study related to key barriers of coordination in construction must be carried out so that the real phenomenon of reluctant to change related to coordination in construction project can be deeply assessed and developed.

In construction industry, the central problem of coordination arose from the fact that the basic relationship between the parties of a construction project has the character of interdependency. There is a lack of match between the technical interdependence of the work and the organizational independence of those who control the work. The construction industry has been struggling to reconcile this technical interdependence and organizational independence. Coordination is one of the most sensitive functions of management. We can distinguish three main functions: Design, Construction and Coordination.

These discussions describe the main concern and principle of coordination that focus on organization, interdependency linking, relationships, information exchange and common goals among team members in various industries. Several questions emerge in line with this intention. What is the coordination context solely adopted in the construction industry? How does the characteristic of construction respond to coordination approach? In comprehensively identifying these answers, coordination in construction industry must be closely

### 2.0 OBJECTIVES OF STUDY

The main objectives of this project is to study the construction coordination practices that are followed at present by

collecting data from small, medium and large scale industries.

The goal of the project is to,

- Prepare the questionnaire from thoroughly studying the literature papers.
- Collecting the filled questionnaires from samples.
- Analysing the data collected.
- Find the mean and rank of the factors from the analysed data.
- To provide suggestions to overcome the key barriers.

### 2.1 SCOPE OF STUDY

The method for this research first involved participating in and collecting data regarding current coordination activities on complex buildings and industrial projects and analyzing these data to describe current coordination processes and identify potential improvements through the use of information technology for horizontal integration. Based on this understanding of current practice, we then built the factors which affect the coordination practices. The next activity was to represent this knowledge in a tool that can make 11 recommendations regarding functionality of the systems, construction plans and methods, and coordination operations.

### 3.0 LITERATURE REVIEW

**Andy NG and Andrew Price (2010)** observed that, most of the subcontractors complain that they are unable to perform to their full capacity due to poor coordination of temporary works and access road to work places etc. Eighteen common site coordination problems and sixteen essential causes to the problems were identified from literature and advices from experienced industrial practitioners. The causes were grouped into three categories: staffing related causes; technical related causes; and management system related causes. The contribution, frequency of occurrence and aggregated importance of the causes on the quality of main contractors' coordination during the construction stage were ranked through a questionnaire survey. Unclear job duties was found to be the most important cause. The results of the survey established that the most important causes were mainly associated with management systems, especially communications, rather than staffing or technical related factors.

**Xue (2006)** found that coordination between organizations is the operation of their relationships. These studies typically describe that relationship of personnel and activities can also be improved through the coordination.

According to **Tey Kim Hai et al., (2012)**, Criticisms of poor performance are not uncommon in the construction industry, and coordination is observed as the best solution to this dilemma. However, construction is still in its infancy level of coordination. The reason behind this phenomenon has

attracted the author focus on studies of barriers to employ coordination in construction. it is no longer impossible to assess coordination performance level of construction project in the future.

### 3.1 DESIGN OF QUESTIONNAIRE

A questionnaire is an instrument consisting of a series of and other prompts for the purpose of gathering information from respondents. A questionnaire is simply a 'tool' for collecting and recording information about a particular issue of interest. It is mainly made up of a list of questions, but should also include clear instructions and space for answers or administrative details. Questionnaires should always have a definite purpose that is related to the objectives of the research, and it needs to be clear from the outset how the findings will be used. Respondents also need to be made aware of the purpose of the research wherever possible, and should be told how and when they will receive feedback on the findings. Questionnaire is formed based on the following factors: Uneven Risk Allocations, temporary organization, construction management approach, Uniqueness and Low Repetition, Multi-Layer Subcontracting, Uncommon Objectives, Labour Intensity, Lowest-Bid-Winner, Complexity and Intangibility of Project activity, Adversarial Relationships, Myriad and Multi-Discipline, Traditional management system, Nature of Construction, Construction Participants, Fragmentation of Construction Process, Characteristic of Organization and Traditional Contractual Arrangement.

### 3.2 COMPANY IDENTIFICATION

Companies for questionnaire survey are mainly classified in to 3 types according to their cost. They are high level, middle level, and low level companies.

- High level companies their project cost is more than 100 crore
- Middle level companies project cost ranges from 5 to 100 crore
- Low level company's project cost less than 5 crore

The companies are selected from in and around Coimbatore area. Totally 9 respondents were duly completed the Questionnaire survey. From those 9 respondents companies, 3 companies were high level companies, 3 were medium level companies, and 3 were low level companies.

### 4.0 RESEARCH FINDINGS

**THE FOLLOWING ANALYSED MAJOR FACTORS GREATLY AFFECT THE QUALITY OF CONSTRUCTION:**

#### COLOUMN WORK:

- Shuttering work
- Cover block
- Manpower

#### BRICK WORK:

- Proportion of mortar mix
- Quality of brick

#### PLASTERING WORK:

- Proportion of mortar mix and man power.

#### 5.0 CONCLUSION AND RECOMMENDATION

Criticisms of poor performance are not uncommon in the construction industry, and coordination is observed as the best solution to this dilemma. However, construction is still in its infancy level of coordination. Therefore, key barriers of coordination in construction have been investigated in this project to achieve its objective. A total of five groups of key barriers are observed including the nature of construction, traditional contractual arrangement, construction participant, characteristic of organization and construction management approach from the literatures. In providing a better understanding, each subgroup is studied thoroughly and summarized by a pie chart in this project. A detailed study is carried out by collecting data and analysing them. From the results obtained it is clear that uneven risk allocations, temporary organizational setup and construction management approach are the main factors which leads to coordination issues. By following new techniques in management and by forming management team, coordination issues can be reduced.

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