

**DEVELOPING CONSTRUCTION MANAGEMENT INTEGRATED SYSTEM
FOR COST, QUALITY AND TIME FOR HIGH RISE BUILDING USING
DELPHI TECHNIQUES**

¹ Mohd Nadeem Quazi, ²Dr. Keerti K. Chowdhary

¹ Civil Engineering and RGPV

² Civil Engineering and RGPV

Abstract: The objective of any construction project is mostly depended on three factors Cost, Quality and Time, for high rise building project the main focus of the client is on these three factors i.e. Cost Quality and time, Here went to make an integrated Management system using Delphi technique for High Rise building construction projects, so that the entire project can be handled smoothly. Over the last three decades, special needs pertaining to construction of high rise buildings have been established. Particular emphasis has been given to reducing construction schedule, construction time for high rise building in real Estate segment with quality and costs reducing of projects because of housing demand, and growth of major cities in developing countries have changed the core concept of traditional construction management system,

The Purpose of this thesis is to analyze and make recommendations in every activity of construction project in order to minimize delays in construction cost quality and time factors. the main factors influencing construction schedules of High Rise buildings, and to describe measures and methods that have been successfully used in achieving significant time reductions in overall construction schedule by using Delphi in project management system. The conclusion are drawn and recommendation are made according to Expert panel (Delphi) associated with the High rise buildings, and to describe measures and methods that have been successfully used and analyze the cost quality and time factor overall construction schedules.

Keywords: Delphi Technique, Expert Panel, Time, Quality & Cost Factors, traditional construction.

I. INTRODUCTION

For high rise building project the main focus of the client is on these three factors i.e. Cost Quality and time. In this thesis we went to make an integrated Management system using Delphi technique for High Rise building construction projects, so that the entire project can be handled smoothly. Cost control is a process where the construction cost of the project is managed through the best methods, by using Delphi techniques so that the contractor does not suffer losses when carrying out the activities of the project. The Time Cost and Quality using Delphi technique: The Concept of time cost and quality concept is deeply embedded in the traditional building procurement system. The time Cost and quality is the principal feasible.

Need for time, quality and cost management

1. Time Management

1.1 How Delphi Techniques use for time management.

2. Cost Management

2.1 How Delphi Techniques use for Cost management for High rise building project.

3. Quality Management

3.1 How Delphi Techniques may use for quality management for High rise building project

II. METHODOLOGY

This section describes different available research methodology, and how a research approach in this thesis was chosen. In any organizational structures and the management styles exercised during planning of a construction project in his own style, a diverse and complex social, economic and political environment influences on each and every major construction projects with different dynamic interaction, therefore, an efficient collection of research data that is valid, reliable and credible is vital, and dependent on the choice of a suitable research method

1. Research Strategy

How this Research was conducted : This research is focused on examining the role of expert management (DELPHI) and effect of the COST QUALITY and TIME factor on major high rise building project within targeted time and budget, the prime objective in this thesis is ,

A) In-depth understanding of the factor affecting, Quality, Cost and time on projects success leading to determining the most relevant and critical strategic success factors.

B) Developing a strategic planning for high rise building using Delphi technique to structuring a new integrated management system that incorporates significant numerical weighting values.

2. Review of Different Research Methods. In qualitative research methods, there are various inquiry approaches including: Phenomenology, narrative inquiry, case studies, ethnography and grounded theory

2.1 Qualitative Analysis

2.2 Case Studies

2.3 Ethnographic Studies

2.4 Phenomenological Studies

2.5 Narrative Inquiry

2.6 Grounded Theory

2.7 Delphi Technique

2.8 Designing a Research Methodology

2.9 Research Chosen Approach

2.10 Triangulation Method Advantages

2.11 Theoretical Saturation.

III. DATA COLLECTION

(1) Delay in time factors in construction projects;

(2) Categorize delay factors in construction projects, into nine (8) major categories.

(3) Quantify relative importance of delay factors and to demonstrate the ranking of factors and categories according to their importance level on delays.

(4) Address the most contributing factors and categories causing delays.

(5) Make recommendations in order to minimize or control delays in construction projects.

Data Collection Methodology; The Data Collection methodology can be summarized in thirty eight (38) different delay factors were categorized into eight (8) major categories and visualized by ranking through the detailed literature review and interview with experts in construction industry. An interview questionnaire was developed to assess the perceptions of Indore construction industry on the relative importance of delay causes. Then, the questionnaire was filled out by sixty (60) highly experienced construction professionals including project managers, site managers, technical office managers, technical office engineers, procurement managers, technical consultants, main contractors, and subcontractors. The collected data were analyzed through Relative Importance Index (RII) method. The analysis included ranking the different causes according to the relative importance indices. The analysis revealed the most contributing factors and categories causing delays.

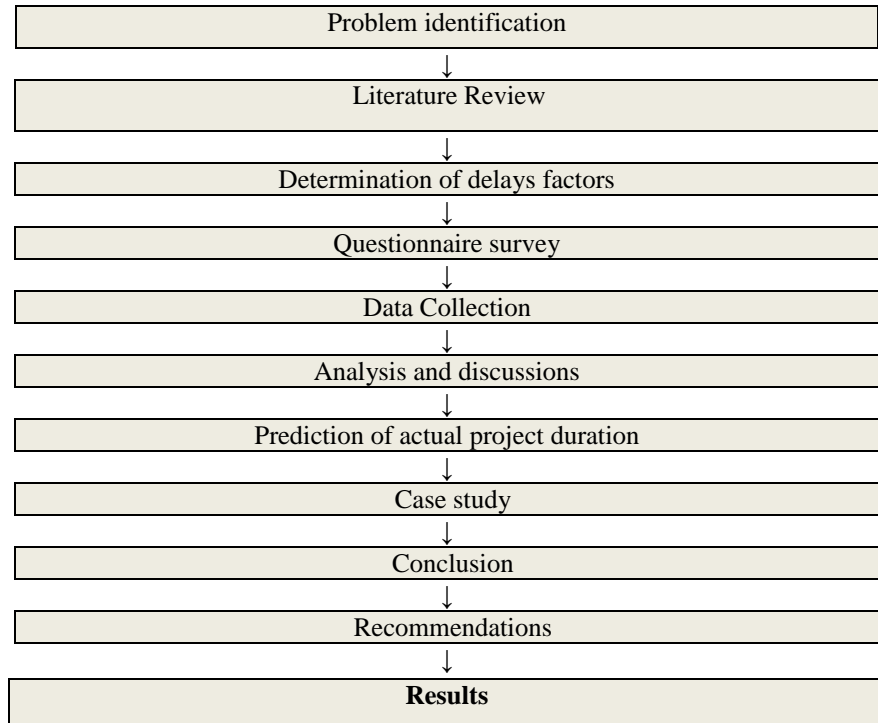
Questionnaires were developed into two (2) major parts (A and B).

Part (A): Personal information of the respondent was collected (e.g., work experience of construction projects, work position, etc.).

Part (B): To obtain information about causes of time delays in construction projects, it was asked to rate those initially identified thirty eight factors

According to their frequency and the procedures used to reduce or terminate the difference between the actual and scheduled time of construction projects. A survey was conducted through personal interviews in which respondents were asked to rank and score these factors according to their experience, there were 60 construction firms were surveyed by questionnaires, for these questionnaires equals to sixty (60) out of which fifty (50) responses were received with response rate equals to 85.71%. Assessment of feedback from questionnaire survey was made. Analysis was carried out for fifty (50) responses to identify major delay contributing factors. Analysis is discussed in details, on the basis of which recommendations to construct projects were made. There are thirty eight (38) factors and are categorized into eight (8) major categories as shown in Table 1 that cause delay in construction project, which are used in this paper, as follows:

Table 1: Pivot Table
Data/information source



IV. Result & Analysis

In the literature review section, it was concluded that:

- A- Success factors appear to be many, often vary from one organization to the other, even from one project to the next.
- B- Many experts do not have the time or the resources to manage numerous success factors.
- C- Engineering domain frequently has an aversion to planning and in many cases treats its contribution to process knowledge as low priority, non-core activity.
- D- Strategic pre-planning, as one part of the front-end planning process, which is normally performed by top management, is extremely vital for success.
- E- The human factor effect on success has not been sufficiently studied; yet, recent research started acknowledging its significance and crucial importance.

various procurement systems have been made for cost and time factor and these are further divided various groups, generic types, conventional (traditional, negotiated, cost plus); design and build (design and build, package deal, turnkey, develop and construct); and management-orientated (management Contracting, construction management, design and manage, The conventional method of building procurement is reported by nearly 70% of respondent clients be the most widely utilized procurement system. The management-orientated (21%) and design and build (9%) systems enjoy considerably less usage. The results are discussed question by question and compare the participating groups' opinions about each issue

V. CONCLUSIONS

The research described in this paper attempts to overcome the limitations of the previous research development in the area of evaluating the construction phase. The main focus of this paper is to design a methodology for the monitoring and evaluation of construction project using Delphi technique and developing a systematic model considering construction projects and analysis every activity from schedule time cost and quality to finished, if any delay of any activity then the Delphi helps to analysis these factor with previous happening and comparing similar past events, causes and try to overcome the loses.

From the past traditional practice of the construction there will be very great losses in time Quality and cost of the project there will be several causes of delay in construction work because of site issues, client objection and process methodologies and many other factors

So in the present research work to improve the these three factors Cost Quality and time for high rise building using Delphi techniques we can control these losses and great saving with higher quality and saving the time also.

VI. REFERANCES

1. Mr. Yan-Chyuan Shiau, Ming-Teh Wang, Tsung-Pin Tsai, Wen-Chian Wang : He develop a construction integrated manage system (CIMS) which helps as a tool, user can effectively generate a bidding list, purchasing material, labour and material analysis, valuation, items and specifications.
2. Assist. Prof. Dr. Sawsan Rasheed Mohammed, Ehab Fadhil Mohammed Ali. Development of an Integrated Construction Management System for Building Estimation. The aim of this research is to present a simple approach for integrating CAD with estimation and planning, and to apply it for the case of building projects, as an example. It presents an approach for integrating the existing software.
3. Mr. Muhammad Imran Yousuf, Volume 12, Number 4, May 2007 (ISSN 1531-7714) , Using Experts' Opinions Through Delphi Technique ,he discusses its strengths and weaknesses, explains the use and stages followed, discusses panel selection, and explains how consensus among participants is reached.
4. Gregory J. Skumoski, Zayad University Dubai al. (2008) Francis T. Hartman and Jennifer Krahn, University of Calgary, Canada, The Delphi method works especially well when the goal is to improve our understanding of problems, opportunities, solutions, or to develop forecasts.
5. Bordoli, D. W. and Baldwin, AN. (1998) "A Methodology for Assessing Construction Project Delays", Construction Management and Economics, 16(3), pp. 327-337
6. CERF (Civil Engineering Research Foundation) (1997) "Construction Technology Goals: An Industry Perspective" washington, DC.
7. Chan, D. W. M. and Kumaraswamy, M. M. (1996b) "An Evaluation of Construction Time Performance in the Building Industry", Building and Environment, UK, 31 (6), November, pp. 569-578.
8. Chan, D. W. M. and Kumaraswamy, M. M. (1997b) "Modeling and Benchmarking Construction Durations for Public Housing Projects" in Proceeding of the International Conference on Construction Process Re• engineering, 14-15July, Gold Coast, Queensland, Australia, pp. 505-516.
9. Chan, D. W. M. and Kumaraswamy, M. M. (1999) "Modeling and Predicting Constructions Durations in Hong Kong Public Housing", Construction Management and Economics, UK, 17(3), May, pp. 351-562.
10. Chew Y. L. Michael, "Construction Technology for Tall Buildings", Singapore University Press, 1999.
11. Daekin P. (1999) " Client's Local Expeoence in Design and Build Projects", Seminar Proceedings on Design and build Procurement Systems, Jan. 14, 1999, Constructons Industry Training Authority, Hong Kong.
12. M. Colomban, "History and Technical Development of Curtain Walling", Proceedings on Building Envelope Systemsand Technology, NTU, 1994.
13. NIST (National Institute of Standards and Technology - US) (1995) National Planning for Construction and Building R&D, Subcommittee on Construction and Building - Civilian Industrial Technology Committee, Report NISTIR 5759.
14. Pietroforte, R. (1997) "Communication and Governance in the Building Process", Construction Management and Economics, 15(1 } , 71-82.
15. Sidwell, A. C. (1997), "Effective Procurement of Capital Projects in Australia", Conference on Construction Industry Development, Singapore, Dec. 1997, 1, 38