

Planning issues in the construction industry construction essay



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Construction is an everlasting activity across the globe. Its profitability like of any other business fluctuates according to the law of demand and supply. In most countries, construction activity constitutes 6-9% of the gross domestic product (GDP) and constitutes more than half of the fixed capital formation as infrastructure and public utilities capital works required for economic development. Construction activity contributes to the economic development of a country. The GDP per capita and the investment in the construction per capita generally follow a straight line relationship, that is construction activity increases with the increase in per capita income. Construction projects are intricate and time-consuming tasks. For the total success of any particular project a wide chain of specialized services is necessary for the timely completion of the project. During the construction process, itself even a project of small or medium proportions requires many attributes, materials and involves many different types of operations. The assembly process must follow a natural order of events that, in total combination, constitutes a complicated pattern of individual time requirements and restrictive sequential relationships among the many segments of the structure (Project Quality Management in Construction, K. Lambrou, G. J. Besseris and C. Alafodimos, MSc in Quality Management, TEI of Piraeus and University of Aisley). Mismanagement of resources has become a prevalent problem in many construction firms. This mismanagement of resources contributes to numerous construction firms' ineffectiveness and frequent failures each year. Hence, it is necessary to take appropriate steps and follow the process to improvise the output of construction industry by using proper planning methods and techniques.

This can be done through adoption of modern and improvised planning techniques in construction industry such as CPM, PERT, Supply Chain Management etc, which will be discussed in detail in main dissertation work. In the literature review of planning issues in construction industry, different aspects of social-cultural-economic importance of planning and modern planning techniques has been highlighted. This dissertation focuses on analyzing the major hindrances caused by the positive and negative issues in planning and execution phase of the project.

2. Background

Planning is a key ingredient in the successful completion of any construction project. It provides the road map for the project to follow and the milestones by which its progress is measured. To understand the loopholes in the planning process it is necessary to dismantle the planning objectives, so that all the aspects regarding the project could be thoroughly capitalized. Four planning objectives which characterize the whole of the planning process are execution of work, coordination of all the activities, control over the materials and manpower and forecasting. Safety is a major concern to every successful construction project because of humanitarian concern for the workers and the cost ramifications of a poor safety record. Major construction firms had proposed the usage of network planning techniques, mainly because of owner's demand.

The relationship between project planning and construction safety is sometimes subtle, and the impact it has on the project is not as readily apparent as the importance of planning and safety as separate entities.

A comprehensive planning and scheduling specification system can aid in the planning of job sequence, financial needs, workforce needs, material needs, and equipment needs. It also can aid the scheduling of actual activity start or completion and provide feedback to control the schedule, cost, and use of resources. A critical step in the execution of any construction project is the selection of planning and scheduling specification clauses to be included in the construction contract. Numerous project characteristics should be taken into account when determining which planning and scheduling clauses to be included.

Project is a mission, undertaken to create a unique facility, product or services within the specified scope, quality, time and costs. With the emerging global opportunities, projects cross geographical boundaries, corporate channels, traditional systems and cultural diversities. The knowledge areas needed to manage such projects comprise project management techniques, general management practices and technology-related subjects. The project management techniques of planning, scheduling and controlling are the tools and devices that bind the subject's knowledge areas. These techniques can be applied to all types of projects. This research focuses on the application of all these techniques in the construction industry.

It is widely recognized that effective planning can play a major role in the success of projects. Whether project success is based on the traditional measure of time, cost and quality or newer measures of critical success factors (Westerveld, 2003), effective planning can also contribute to the prevention of accidents and ill health of site personnel (Duff and Suraji, <https://assignbuster.com/planning-issues-in-the-construction-industry-construction-essay/>)

2000; HSE, 2003). These objectives become increasingly difficult to achieve, however, in construction projects. Construction sites can be extremely busy places where the working environment is ever changing. Unfortunately, in addition to this, the construction industry tends to be under resourced and under planned in relation to other industries (Egan, 1998), which can lead to a crisis management approach to production risk, a feature of construction culture which can impact heavily on health and safety. Despite this, activities requiring intensive planning as those required in a temporary rail possession, almost invariably run smoothly. There is little chance of an unsafe incident, due to the heightened risk awareness resulting from the meticulous planning.

3. Aims and Objectives

To study various minute details affecting the process of planning. The objective of this research is to assess the modern methods of planning and scheduling a construction contracts which can be applied in today's construction industry and to also discuss the issues involved in the application of those tools. To compare and analyze a planning strategy which has a solution for various issues in the planning process.

4. Research Methodology

The research methodology is the approach through which the researcher collects the data useful for the chosen topic and then the analysis is done on the basis of that. In my dissertation, I will be using qualitative research as means to study planning and scheduling in construction contracts.

5. Scope and Limitations of Dissertation

The limitations of the dissertation are:

This research targets only construction industry, hence the results cannot be implied on the others sectors.

This analysis will be done for Indian and UK industry. However, the study done on India and UK is not necessary applicable for other nations as well as because of cultural differences.

Planning techniques for different countries is different which adds to more misery. The unavailability of proper planning and management techniques, which could possibly solve the issues of planning even when proper resources are not available.

Construction Industry has flourished domestically as well as globally over the years. Economic development of any particular country also largely depends upon the construction projects. Major factors that affect the overall result of any project would be size, complexity, quality, productivity, completion time and cost. These factors would be achieved only when proper planning is done, which forms the base of construction management. A project plan is always formulated during the planning phase. Planning in its broader perspective, involves advance thinking as to what is to be done, what are the activities, how it is to be done, when it is to be done, where it is to be done, what is needed to do it, who is to do it and to ensure that it done. A project plan would be adversely affected if cost overruns and delays take place. The effect of past construction experience, on the quality of management in

general and on planning effectiveness in particular, is addressed only rarely
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in construction-management research; the few studies doing so explicitly are in agreement with the findings of the present study. NEDO ("Faster" 1983) reports the contractor's inexperience in similar projects as a major source of difficulty in construction ["Faster building for industry" (1983). NEDO-Building EDC, National Economic Development Office, London, England.]. All the perseverance put into the invention of new techniques did not give the satisfying results in the construction planning sector (Choudhury 1981, Mason 1984, Morton 1983). Sometimes people fail to recognize the difference between planning and scheduling. Progress in the usage of new computer techniques has resulted in the misconception of standardization of project scheduling.

Projects have been a part of our society for quite a long era. Indication of total efficiency would be seen by completing project on time, but construction process is subjected to too many fluctuations and unforeseeable factors which results from many sources (Sadi. A. Assaf, Sadiq Al-Hejji, (2005)). Construction organization lives in the ever-changing and their effectiveness depends on their ability to adapt to new demands and opportunities. This industry needs to adjust itself to the changes occurring in its working environment in order to become effective. Construction projects are intricate and time-consuming tasks. The total development of a project normally consists of several phases requiring a diverse range of specialized services. In progressing from initial planning to project completion, the typical project passes through successive distinct stages that demand inputs from such disparate groups as financial organizations, government agencies, engineers, architects, lawyers, surety companies, contractors, and building

trade-persons. Most challenging part of these modern techniques is implementing these methods to achieve a particular goal or task. Construction Industry faces a lot of problems because of the working patterns and inefficient planning techniques to reach to complete a particular function. Following the modern planning techniques reduces the dilapidation of resources and economically strengthens the company. A constant focus should be given on the improvisation techniques which include mutually collaborating one or more techniques which would lead to a profitable project and reduce the loss due poor performance and cost overruns. The constructions industry in India and UK has realized the importance of the proper usage of modern planning techniques which has improvised the margins of profits and truncate the overall project cost. In India planning is an open process (Planning in India RICHARD S. ECKAUS MASSACHUSETTS INSTITUTE OF TECHNOLOGY). If design completion is not done at proper time it would prove to be costly, as it would lead to construction delays. In India a prevalent method to planning is not sufficient as there are many situations which includes

Limitation or inexpertness of human beings in there respective fields (Human Errors).

Influence of external factors beyond human control

(E. g. Natural Hazards: this could have an adverse effect on the planning process).

The external components interact with the construction firm from outside of the organization's environment. Such external components are material
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suppliers, financial institutions, and surety companies, end users of products, owners, and architects.

The project is also influenced by external causes due to scarce availability of resources in the market (Techniques and Technology).

The project covers important framework of an integral system; therefore considerable economic or technical consequence could result from faulty usage.

(An approach to planning and control of advanced projects Giorgio Caroni, Roland0 Matteelli and Alfred0 Berti)

In order to have a competitive edge over other construction companies, perfectly planning techniques should be used.

Main Body

CASE STUDY:

Even though India is one of the developing countries the approach towards planning is comparatively more advanced as compared to other developing countries. (Planning in India, RICHARD S. ECKAUS, MASSACHUSETTS INSTITUTE OF TECHNOLOGY). In India, for small scale project ranging between 1million£-10million£ specific planning techniques cannot be implemented, as a lot of unavoidable problems usually arise due to many reasons. Comprehensive survey of the location of the project clearly marks the project area and its boundaries. Soil investigation is to be done to ascertain the soil strength so as to decide the type and other specific details of the foundation. Depending upon the soil investigation reports, finalize the

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type of foundation i. e., pile foundation or open foundation up to hard strata strength. Necessary approvals, clearances, no objection for all the concerned government departments, local or self governing authorities should be obtained before starting the project. To ascertain whether any public utility service lines like Water pipe lines, sewage pipe lines, electrical cables or overhead lines, telephone line or any other Public/Private items or assets are crossing /passing through the designated project area. Specific measures must be taken to relocate the service lines or public assets before starting the project.

Drawings incorporating all the specific details, dimensions and other specifications must be accurate and must be got approved from all the relevant authorities before starting the work

If any of the above fundamental issues are neglected at the planning stage, you are steadily heading for a project period over run and project cost overrun.

TYPICAL CASE STUDIES FROM INDIA

BUILDING PROJECT OF CBI(CENTRAL BEAURAU OF INVESTIGATION)

BUILDING

1) Name of Work : Construction of Administrative Building including

all infrastructure Amenities for C. I. D Pune. at Pune

2) Client : Maharashtra State Police Housing & Welfare Corporation.

Limited, Mumbai

3) Tender Work Order No : PHC/TB/CID PUNE/1152/2005

Dated - 15. 07. 2005 from General Manager

4) Contractor : M/s. Deepa Engineers,

42, Welfare Chambers, 1st Floor,

Sector-17, Vashi, Navi Mumbai - 400 705

5) Architect : M/s. Arc-Aids. Pune

6) P. M. C : M/s P&P Ventures, Pune

7) Tendered Amount : 5, 43, 04, 161/-

8) Date of Starting : 02. 09. 2005

9) Stipulated period of completion : 31. 05. 2007

10) Area as per tender : 5483. 57 Sq. Mtr

11) Area as per actual construction : 7217. 19 Sq. Mtr.

Including Common Facility.

12) Common Facility Area : 109Sq. Mtr

1) Septic Tank = 36 Sq. Mtr

2) Meter Room = 19 Sq. Mtr

3) Pump House = 54 Sq. Mtr

13 Area Constructed : 7108. 19 Sq. Mtr

(7217. 19-109 = 7108. 19 Sq. Mtr)

14) Actual date of completion/ : 31. 03. 2009

Taking over 10. 07. 2009

15) Difference in Area : 1669. 62 Sq. Mtr.

16) R. A. Bill No. 21st (pending) : 30, 70, 629. 00

17) Final Bill yet pending : 26, 01, 169. 00

18) Security Deposit : 13, 57, 604. 00

19) Retention money deducted

From 20th R. A. Bill : 1, 38, 747. 00

20) Retention money deducted

From 21th R. A. Bill : 1, 52, 052. 00

21) Extra Items Amount : 1, 83, 210. 00

22) Inauguration Expenditure : 3, 10, 000. 00

23) Bank Guarantee En cashed : 13, 57, 604. 00

Total Claims overdue : 91, 71, 015. 00 + Difference in Constructed

Area amount

Conclusion

Departmental interaction between various service agencies of the state, like the police housing Department and PUNE Municipal Corporation must have been initiated at the planning stage of the tender itself.

Though the project is commissioned successfully on 10th July-2009 and the C. B. I has occupied the Administrative Building, with all the proposed amenities the Contractor has suffered huge financial losses. Presently the case is under arbitration

Justification for the delay of work

1) M/s. Arc-Aids, (Architect) & M/s. P&P Ventures, Pune (PMC) were new to the department & lack of coordination between them & with Police Housing and the contractor resulting in bad delay in furnishing the requisite drawings and other relevant details for the timely execution of the work.

2) Delay due to the shifting of approx One Meter Diameter Water pipe line of Pune municipal corporation which was not shown in the layout drawing of the tender, passing through the site & feeding water supply to Pune City - Delay 10 Months. The work was coordinated by Deepa Engineers and executed by Pune Municipal Corporation without any financial obligations to PHC.

Drawings must incorporate all the details accurately, after carrying out proper survey of the project area.

3) Non releasing of the payments in time by holding of Running Bills payment by imposing heavy penalty as given below, which was against the terms & conditions of the Tender, since the delay was caused by reasons beyond the responsibility & control of the contractor

Sr. No.

Particulars

No. of days

Amount to be recovered from Bill in Rs.

1

Rs. 1000/-per day w. e. f. 1/6/07 to 15. 01/08

229

2, 29, 000/-

2

Rs. 5000/-per day w. e. f. 16/01/08 to 15/02/08

31

1, 55, 000/-

3

Rs. 10000/-per day w. e. f. 16/02/08 to 12/05/08

87

8, 70, 000/-

4

Rs. 15000/-per day w. e. f. 13/5/08 to 30/06/08

49

7, 35, 000/-

5

Rs. 65000/-per day w. e. f. 1/7/08 to 10/07/09

375

2, 43, 75, 000/-

Total**771****2, 63, 64, 000/-**

This holding of payment was waived and released by Hon. S. S. Virk after joining as M. D. of Police Housing Corporation and assured that the penalty will be waived and the difference in area constructed will be consider after completing the work. Accordingly the work is restarted and completed on 31. 03. 2009 and handed over on 10. 07. 2009. Month wise requirement of funds if predicted during the planning's stage itself, the payment schedule & flow of money will not be hampered.

B) Name of Project:

1) Construction of three storeyed of 300 seated Post Graduate Hostel including internal Water supply, Sanitary installation, Drainage work and internal electrification work for Vishweshwarayya National Institute of Technology, Nagpur, India

Name of Contractor : M/s. DEEPA ENGINEERS,

42, WELFARE CHAMBERS, 1ST FLOOR,

SECTOR-17, VASHI, NAVI MUMBAI

Estimated Cost : 5, 33, 56, 856/-

Tendered Amount : 9, 34, 63, 099. 00

Time allowed : 16 Months including monsoon

Period

Commencement Date : 12. 07. 2007

Stipulated date of completion : 11. 11. 2008

Security Deposit : 46, 73, 155. 00

(Bank Guarantee)

Project Management : Central Public Works Department,

Superintending Engineer,

Central Circle, Nagpur.

Architects : — do —

B) Name of Project: Construction of Additional storey (100 seated) over proposed 300 seated Post Graduate Hostel at Vishweshwarayya National Institute of Technology, Nagpur.

Name of Contractor : M/s. DEEPA ENGINEERS,

42, WELFARE CHAMBERS, 1ST FLOOR, SECTOR-17, VASHI, NAVI MUMBAI

Estimated Cost : 1, 78, 70, 130. 00

Tendered Amount : 2, 36, 39, 902. 00

Commencement Date : 28. 11. 2008

Stipulated date of completion : 27. 05. 2009

Security Deposit : 11, 82, 000. 00

(Bank Guarantee)

Time allowed : 6 Months

Project Management : Central Public Works Department, Superintending Engineer, Central Circle, Nagpur.

Architects : — do —

Actual date of Completion : 31. 03. 2010

Parameter adopted for mix design for RCC works Ready Mix Concrete

Nominal maximum size of aggregate : 20 mm angular as per C. P. W. D. description

Degree of quality control : Good

Type of Exposure : Moderate

Maximum water cement Ratio : 0. 50

Cement Content : 410/Kg/cum of concrete

Type of Cement used : OPC 43 grade Conforming to

IS: 8112

Sand : Coarse sand as per CPWD

Specification

Approved Admixtures conforming to I. S. 9103 permitted

Fly wash shall not be used in R. C. C

The Contractor shall submit the Mix Design Report from Approved Laboratory and get it approved from the Engineer-in-Charge

Causes for the delay in completion of the project.

Inaccurate Soil Investigation Report.

The Original depth of Excavation, for Foundation fixed as 5ft(1. 52 m) as per tender. At the time of actual execution the depth upto 10ft which resulted in huge quantity variation in excavation, quantity of steel and other items necessitating further approvals from all competent authorities.

This project cost overrun and period overrun could have been avoided if proper soil investigation was carried out before tendering

A Major defect in planning was the decision to have an additional floor with 100 seats after the completion of the hostel building up to 3rd floor by the contractor.

The right decision to have a Four storied 400 seated Hostel building initially would have saved the Project period by at least 4 months Also there could have been a saving of the total Project cost by at least 03 %

TABLE OF MILESTONE (S) - CASE B(1)

S. No.

Financial Progress

Time allowed

(from date of start)

Amount to be withheld in case of non achievement of milestone

1

All P. C. C. and brick works up to plinth level

120 days

In the event of not achieving the necessary progress as assessed 1% of the tendered value of work will be withheld for failure of each milestones

2

Complete R. C. C structure up to terrace level

240 days

3

All brick work , flooring, internal plaster, fixing of door frames and windows etc along with all related items

355 days

4

Water proofing to terrace slab, external plaster and painting, fixing of all electrical and water supply, sanitary fitting etc. complete along with handing over of building including external service connections complete.

16 months

TABLE OF MILESTONE (S) - CASE B(2)

S. No.

Physical Progress

Time allowed

(from date of start)

Amount to be withheld in case of non achievement of milestone

1

All R. C. C. Columns

30 days

In the event of not achieving the necessary progress as assessed 1% of the tendered value of work will be withheld for failure of each milestones

2

Complete R. C. C and brick work up to terrace level

90 days

3

All brick work , flooring, internal plaster, fixing of door frames and windows etc along with all related items

150 days

4

External plaster and painting, fixing of all water supply, sanitary fitting etc. complete along with handing over of building including external service connections complete.

6 months

Results from the Case Study: IN GENERAL VIEWS

Table 1

List of causes of delay which may affect the overall planning is categorized below

(Causes of delay in large construction projects, Sadi A. Assaf *, Sadiq Al-Hejji)

No. of. Causes of delay affecting the planning process

Group

1 The Original contract duration is very short

Project

2 Disputes between various parts

Project

3 Inadequate definition of substantial completion

Project

4 Ineffective delay penalties

Project

5 Type of construction contract (Lump sum contract, construction only,)

Project

6 Type of project bidding and award (lowest bidder)

Project

7 Delay in payments by the owner

Owner

8 Delay to furnish the site to the contractor by the owner

Owner

9 Revision orders by the owner during construction phase

Owner

10 Late in changing and approving the design documents by the owner

Owner

11 Delay in approval of drawings and the sample materials

Owner

12 Improper communication by owner and other parties

Owner

13 Unwillingness to make proper decisions

Owner

14 Disagreements occurring between joint-ownership of the project

Owner

15 Absence of incentives for contractor for finishing the work ahead of schedule

Owner

16 Discontinuation of work by owner

Owner

17 Financial problems faced by contractor

Contractor

18 Problems in sub-contractors schedule in execution work

Contractor

19 Alterations during construction due to some minor errors

Contractor

20 Affray between contractor and other parties

Contractor

21 Inappropriate site management by the contractor

Contractor

22 Inappropriate communication by contractor with other parties

Contractor

23 Poor planning of project by the contractor

Contractor

24 Improper construction techniques implemented by contractor

Contractor

25 Postponement in sub-contractors work

Contractor

26 Inadequate standard of work by contractor

Contractor

27 Periodic changes of sub-contractors

Contractor

28 Poor qualification of technical staff

Contractor

29 Mobilization problems at site

Contractor

30 Postponement in inspection and testing by consultant

Consultant

31 Delays in the approval of major changes in the scope of work by consultant

Consultant

32 Inflexibility shown by the consultant

Consultant

33 Improper coordination between consultant and other parties

Consultant

34 Slow to review and approve the documents by the consultant

Consultant

35 Issues between the consultant and the design engineer

Consultant

36 Inadequate experience of consultant

Consultant

37 Mistakes in the design documents

Design

38 Delay in delivering the design documents

Design

39 Imperfect details in drawings

Design

40 Complications in understanding of the project design

Design

41 Incomplete data collection & survey before design

Design

42 Confusion in owners requirements by design engineer

Design

43 Insufficient design-team experience

Design

44 Low amount of usage of advanced engineering design software

Design

45 Shortage of construction materials in market

Materials

46 Alterations in the type of materials and specifications during the construction

Materials

47 Immobilization of material

Materials

48 Damage of sorted material while they are needed urgently

Materials

49 Delay in manufacturing special building materials

Materials

50 Late procurement of materials

Materials

51 Late in selection of finishing materials due to availability of many types in market

Materials

52 Equipment breakdowns

Equipment

53 Shortage of equipment

Equipment

54 Low level of equipment-operators skill Equipment

Equipment

55 Lack of high-technology mechanical equipment

Equipment

56 Shortage of labours

Labours

57 Unqualified workforces Labours No. Causes of delay Group

Labours

58 Nationality of labours

Labours

59 Low productivity level of labours

Labours

60 Personal conflicts among labours

Labours

61 Effects of subsurface conditions (e. g., soil, high water table, etc.)

External

62 Delay in obtaining permits from municipality

External

63 Hot weather effect on construction activities

External

64 Rain effect on construction activities

External

65 Unavailability of utilities in site (such as, water, electricity, telephone, etc.)

External

66 Effect of social and cultural factors

External

67 Traffic control and restriction at job site

External

68 Accident during construction

External

69 Differing site (ground) conditions

External

70 Changes in government regulations and laws

External

71 Holding up the work from the important utilities i. e., water, electricity etc

External

72 Final inspection has been delayed by a third party

External

Literature Review:

Definitions and Concepts of Planning and Planning issues

Planning can be defined as any one of the following:

- 1. A decision-making process.**
- 2. A process of anticipatory decision-making – to decide what and/or how to perform actions due at some point in the future.**
- 3. A process of integrating interdependent decisions into a system of decisions.**
- 4. A hierarchical process evolving from general guidelines to objectives, to the elaboration of means and constraints that lead to a detailed course of action.**
- 5. A process that includes part or all of a chain of activities comprising information search and analysis, development and design of alternatives, analysis and evaluation of alternatives and choice making.**
- 6. The systematic employment of procedures (standardized and formal to varying degrees).**
- 7. Documented presentation, in the form of plans.**

(Is construction project planning really doing its job? A critical examination of focus, role and process, A. Laufer; R. L. Tucker, Department of Construction Management, Technion IIT, Haifa, Israel b Construction Industry, Institute, The University of Texas at Austin, TX, USA)

Social-Cultural-Economic Importance of Planning(POSTIVE AND NEGATIVE)

Cultural Aspects:

(International Measurement of the Economic and Social Importance of Culture, Prepared by

John C. Gordon and Helen Beilby-Orrin)

. The Australian statistical office