

Analysis of Time Delay and Cost Overrun in Road Construction

Anish C., Kiruthiga K., Vinoth S.

Abstract: Road construction is the important division in the construction industry and the most predominant part of a society. The roadway defines the development of a country or a state and brings in the economic development of the same. The reasons for choosing a project on the roadways are its vast scope of day to day development and progress in this area.

Thus it is clearly seen that roadways is the most essential in today's world without which progress and development cannot take place at full fledge. Therefore any delay in completion of a road constructing project may have its impact in degrading of a society. Also at the same time the budget overrun or cost overrun of such project is highly unbearable.

Key Word: Roadway, Cost Over Run

I. INTRODUCTION

Deferral as alluded in development is delayed development period and interruptions of occasions that exasperate the development program. Deferrals and Cost overwhelm are among the difficulties looked throughout executing development ventures. Postponements just as cost invade are wellsprings of potential dangers that present examinations are investigating approaches to oversee. Development postponement is characterized as "the time overwhelm either past fulfillment date indicated in an agreement, or past the date that the gatherings settled upon for conveyance of a venture." Delay is likewise characterized as a "demonstration or occasion which stretches out expected time to perform or finish work of the agreement shows itself as extra long stretches of work"

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II. METHODOLOGY

The Data are collected through two methods namely questionnaire and case study. Questionnaires are conducted from few concerned persons. This survey helps in finding the Relative

Importance Index (RII), later this value is used in determining cost variation that occurs in project that are concerned under case study.

Likewise, for the finding out time delay process, time schedules and activity schedules are collected from the case study of specified projects.

Finally, factors leading for both cost overrun and time delay are displayed in charts, so that the intensity of the factors and its performance to hinder the actual cost budget and time schedule of the project are clearly studied.

III. RESULTS AND DATA ANALYSIS

A. Data Collection

Simple questionnaire survey were conducted to individuals concerned in the highway projects. The result of the survey was the input to determine the Relative Importance Index (RII). Relative Importance Index (RII) calculation is used to determine relative significance and ranking of cost and overrun factors.

B. Data Analysis

The The data received through the survey had 16 respondents and they are categorised in the fig .1

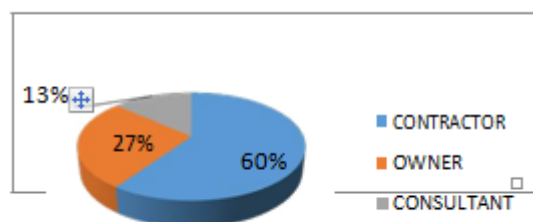


Figure.1.Data Analysis

C. Cost Overrun And Time Delay Factors (Expressed In Charts)

The Various surveys are conducted as mentioned and the results are expressed using charts for convenient purpose. These charts shows the ranking positions of each factor which is numbered then using the mean value obtained from the survey conducted. The result of the survey are processed and analysed in the SPSS software tool.

D. Factors Related To Financial Groups

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 6.2 and they are denoted by,

Ca1 -Market demand

Ca2 - Increase in tax

Ca3 - Poor financial control in site

Ca4 - Delay in payment to supplier/sub-contractor

Ca5 - Bureaucracy in tendering method

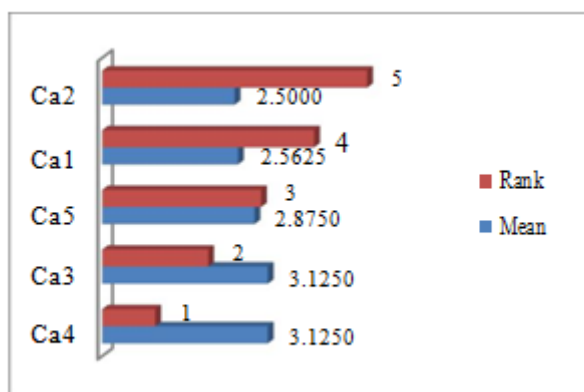


Figure.2. Factors related to financial groups

E. Factors Related To Construction Parties

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in Figure 5.5 and they are denoted by,

Cb1 - Lack of information flow between parties

Cb2 - Lack of co-ordination between projects

Cb3 - Lack of communication between parties

Cb4 - Lack of qualified project manager

Cb5 -Lack of experience in line of work

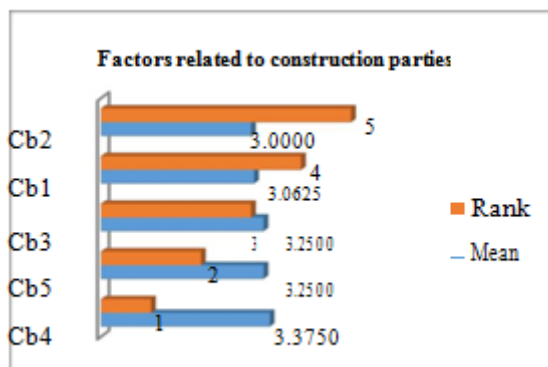


Figure.3. Factors related to construction parties

F. Factors Related To Construction Items

Use In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.6 and they are denoted by,

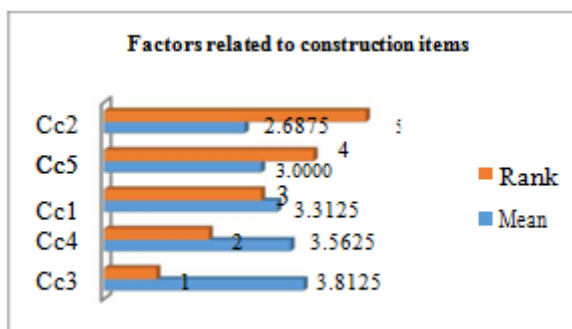
Cc1 - Incomplete design and drawing

Cc2 - Slow inspection of completed work

Cc3 - Wastage of materials in the site

Cc4 - Inadequate review of contract documents and specifications

Cc5 - Inadequate quantity takeoff



Then the sample was fused with 0.1 N of NaOH with the removal of iron and tested for CEC which yielded a value of 20meq/L.

Then the sample was fused with sodium aluminate without the addition of NaOH and tested for CEC which yielded a value of 20 meq/L.

From the above tests the effect of removal of iron and addition of NaoH was understood. Moreover when the sample was dried and then ground a paste like substance was formed which was dried and then the various parameters like temperature and time were tried out. There are a lot of other possibilities which can be tried out by varying the Molarity of

NaOH and the concentration of Sodium Aluminate .

Sl no	Description	Value in %
1	SiO ₂	51.17
2	Al ₂ O ₃	38.7
3	Fe ₂ O ₃	8.99
4	CaO	0.14
5	MgO	0.14

Figure.4. Factors related to construction items

G. Factors Related To Environmental Group

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.7 and they are denoted by,

- Cd1 - Weather condition
- Cd2 - Geological condition of project site
- Cd3 - Social and cultural impacts
- Cd4 - Law and regulations
- Cd5 - Location of project

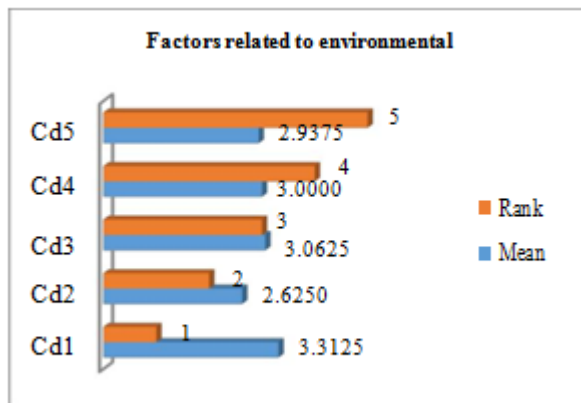


Figure.5. Factors related to environmental

H. Factors Related To External Group

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.8 and they are denoted by,

- Ce1 - Exclusive control of certain group of material suppliers
- Ce2 - Difficulty in importing materials and equipments
- Ce3 - Political situation
- Ce4 - Dealing with suppliers and traders
- Ce5 - Permits or Approvals for land procurement and acquisition

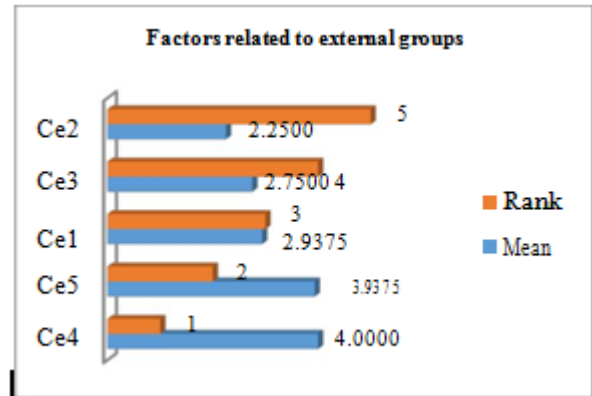


Figure.6. Factors related to external group

I. Factors Related To Materials

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.9 and they are denoted by,

- Cf1 - Shortage of material
- Cf2 - Late delivery of materials
- Cf3 - Escalation of material price
- Cf4 - Change in material specification
- Cf5 - Wastage of materials

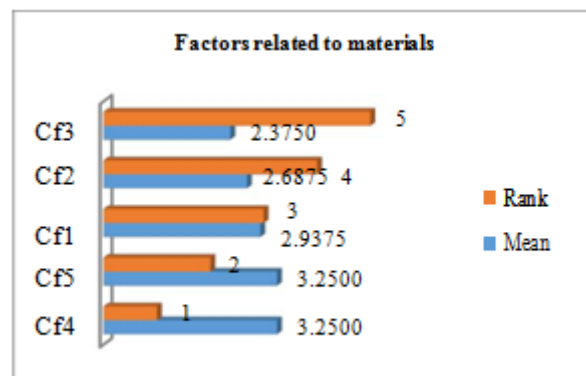


Figure.7. Factors related to materials

J. Factors Related To Labor And Equipment

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.10 and they are denoted by,

- Cg1 - Lack of availability of equipment
- Cg2 - Inadequate labour productivity
- Cg3 - High cost of machinery and labour
- Cg4 - Frequent breakdown of construction plant and equipment
- Cg5 - High transportation cost

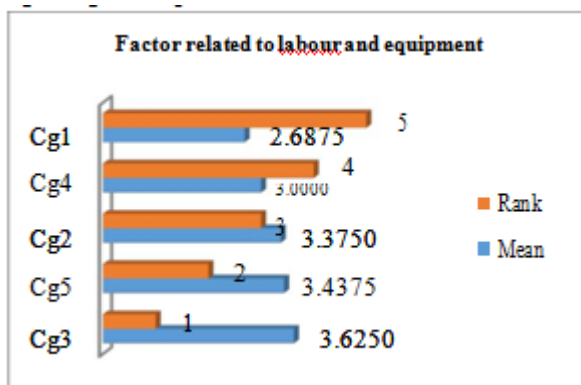


Figure.8. Factors related to labor and equipment

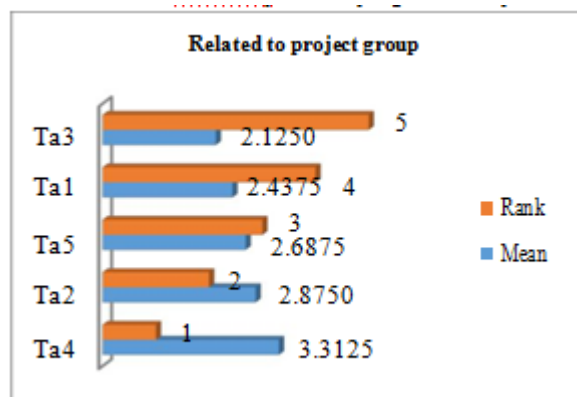


Figure.10. Factors related to Project Group

K. Factors Related To Owners

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.11 and they are denoted by,

- Ch1 - Additional work at owner’s request
- Ch2 - Owner’s unwillingness to help
- Ch3 - Delay in progress payment by owner
- Ch4 - Owner’s emphasis on high quality
- Ch5 - Delay in decision making

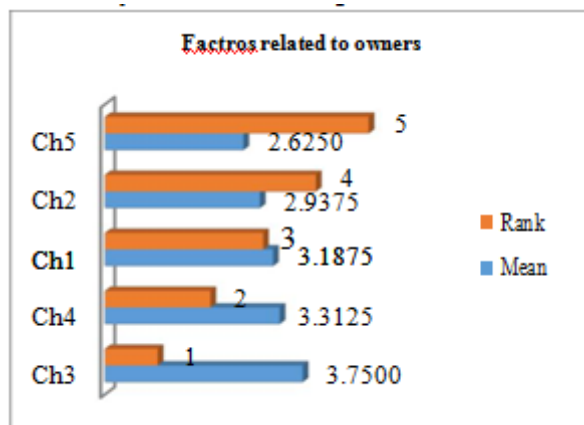


Figure.9. Factors related to owners

L. Factors Related to Project Delays

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.12 and they are denoted by,

- Ta1 - Inconvenient site access
- Ta2 - Disturbance to public activities
- Ta3 - Limited construction area
- Ta4 - Poor terrain condition
- Ta5 - Poor soil drillability and laying suitability

M. Factors Related To Internal Delay Factors

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.13 and they are denoted by,

- Tb1 - Change orders by the owner during construction
- Tb2 - Delay in progressing payments
- Tb3 - Ineffective planning and scheduling by the contractor
- Tb4 - Poor site management by the contractor
- Tb5 - Shortage of labours
- Tb6 - Difficulties in financing the project by the contractor

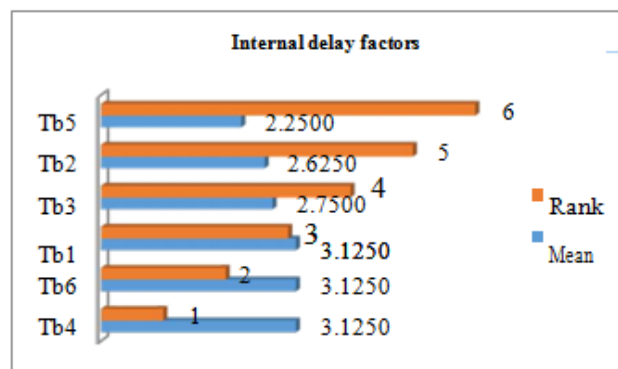


Figure.11. Internal delay factors

N. Factors Related To Managerial Group

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.14 and they are denoted by,

- Tc1 - Poor communication between construction parties
- Tc2 - Delays in decision making
- Tc3 - Unreasonable project time frame
- Tc4 - Improper construction method
- Tc5 - Late issuing of approval documents and late land hand over

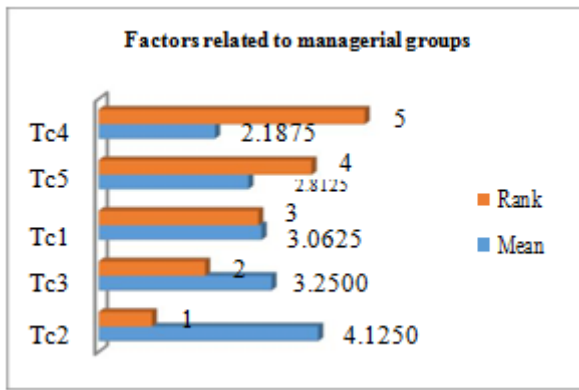


Figure.12. Factors related to managerial groups

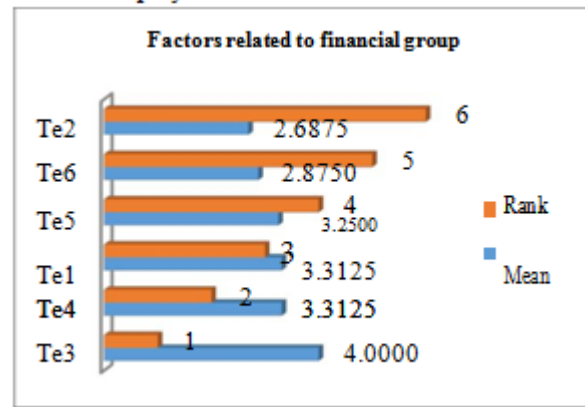


Figure.14. Factors related to financial group

O. Factors Related To Consultant Group

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.15 and they are denoted by,

- Td1 - Mistakes in design
- Td2 - Design changes & inappropriate design
- Td3 - Late inspection and late approval
- Td4 - Insufficient and incapable inspectors

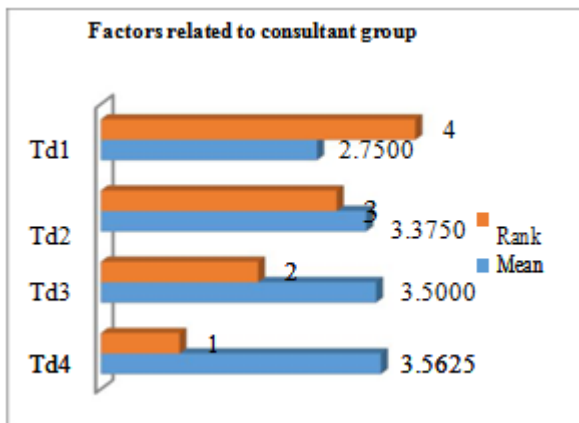


Figure.13. Factors related to consultant group

K. Factors Related To Financial Group

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.16 and they are denoted by,

- Te1 - Payments delay by the owner
- Te2 - Financial status of contractor
- Te3 - Financial status of contractor
- Te4 - Exchange rate fluctuation
- Te5 - Inflation
- Te6 - Monopoly

L. Factors Related To External Group

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.17 and they are denoted by,

- Tf2 - Segmentation of West bank
- Tf3 - Weather condition
- Tf4 - Natural disaster

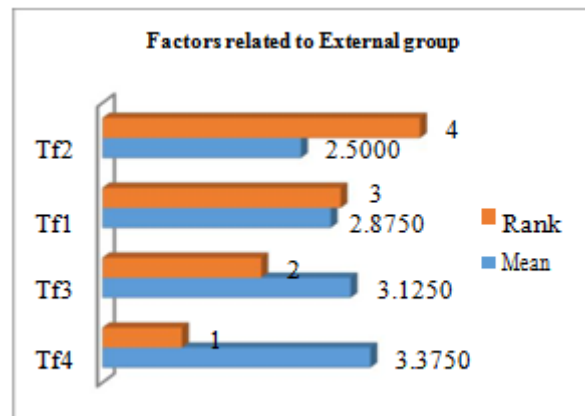


Figure.15. Factors related to external group

K. Factors Related To Construction Item Group

In this chart, factors are ranked from very high influencing factors to very low influence factors as shown in figure 5.18 and they are denoted by,

- Tg1 - Insufficient labours
- Tg2 - Rework from poor workmanship
- Tg3 - Lack of Equipment efficiency
- Tg4 - Unavailable construction material
- Tg5 - Rework from poor material quality

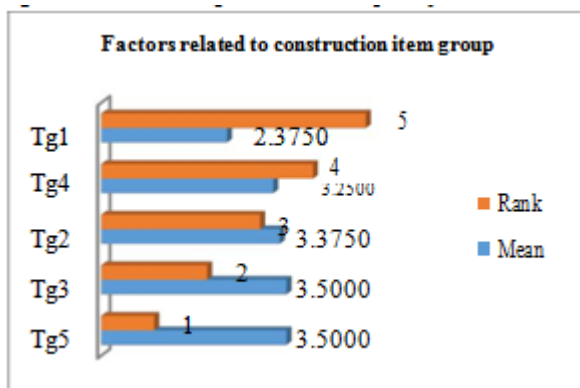


Figure.16. Factors related to construction items Group

IV. CONCLUSION

Road construction is the important division in the construction industry and the most predominant part of a society. The delay in completion of a road constructing project may have its impact in degrading of a society. Delays are insidious often resulting in time overrun, cost overrun, disputes, litigation, and complete abandonment of projects. The factors analyzed in this project are evitable practically if the correct source starts repairing the root cause. The rectification cost overrun and time delay can be done only by the cooperation of all the groups associated with the construction industry. This project does not mean if things are done as per stated in this paper would rectify all the problems and difficulties faced in the industry, but a considerable amount of changes can be brought which may save a lot of amount and time.

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