

FRAME WORK FOR FACTORS AFFECTING INFRASTRUCTURE PROJECT PERFORMANCE: A REVIEW

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Abstract: Construction industry became competent in last few years. Managers always want to perform well in the entire domain but to achieve the targets we have to look after lots of variables. Most of the top-level management persons consider only the financial number of the project. By doing that they neglecting the other important variables that affect the project performance. To make the construction project successful, we do need to take care of lots of variables. Factors, which are affect the performance of project will be, use to evaluate project and help the managers to take an analytical decision. In this paper, we reviewed various paper to make an effective framework for factors affecting infrastructure project performance.

Keywords - Project performance, Infrastructure, Construction project, Performance indicators

I. INTRODUCTION

Infrastructure sectors grows astonishingly in past few years in India. It also supports other sectors to grow together so indirect contribution of this sector is very important in Gross domestic product (GDP) of the nation. According to government recent reports, infrastructure sectors contribute approximate 9% of total Gross domestic product (GDP) of India. (1) This sector also provide large amount of employment for the nation. The Construction industry in value is expecting to record a CAGR of 15.7% to reach \$ 738.5 billion by 2022. (1) Government also take interest to develop very sustainable infrastructure in the various parts of India. Investment is at its peak for the infrastructure projects therefor performance of these projects should the positive in all aspects. Majority of the company focus on the financial factors of the project but now days projects get more complicated so it is mandatory to think about other factors that influence the project performance. The dimension of accomplishment in completing construction project development exercises will depend intensely on the nature of the administrative, money related, a technical and authoritative performance of the separate gatherings while mulling over the related risk management, the business condition, and financial and political strength. Usually in construction projects, performance use to measure based on the iron triangle. Refer iron triangle in the fig. 1



Fig 1: Iron Triangle

II. TYPE CRITICAL LITERATURE REVIEW

Some critical literature review regarding performance indicators in construction projects are mention below

Takim et al. (2002) conducted study to find out the performance indicators for successful construction project, From his study found out various factors for contractor during project which are performance standard good working relationship, construction method and technology, man force utilization productivity rate safety constructability communication & reporting cost control techniques. [16]

K.N.Jha et al. (2005) studied critical factors affecting quality performance in construction project. He used five-point ordinary scale for analysis of the data by Statistical package for social science (SPSS) software. After listing factors to find top critical factors he used regression model and found positive factors that affect project performance were project manager's competence, owner's competence interaction between project participants and monitoring and feedback by project participants. [6]

Mladen Radujković et al. (2010) studied various KPIs, which effect the Construction industry. To analyse the collected data he used Relative Important Index (RII) Method. He stated that the KPIs according to contractor were quality cost Identification

of client's interest schedule cooperation with subcontractor Motivation Productivity Innovation and learning, Time increase, Client satisfaction, financial stability and cash flow. [8]

Hany abd Elshakour M. Ali et al. (2012) studied performance indicators for the building construction companies. During his study, he found out 47 factors in different five perspective Financial, customers, internal business, environment, learning and growth. Author used Relative important index (RII) method to analyse the data and major five findings were Profitability, Quality of service and work, growth. [4]

Qi Wang et al. (2013) conducted study to measure performance in construction enterprises he used six main prospective. Those major perspectives were financial, customers, internal business, innovation, learning, and environment. He used simple means and standard deviation for analysis of his data. [11]

Murat Dunduz et al. (2015) studied various success factors for construction industry. He analysed collected data using RII(relative importance index) method and frequency index method now to adjust importance index he used Frequency adjusted importance index (FAII), based on that top five ranked factors were organization's technical capability scope and work definition control system effective site-management project managers capability and commitment. [9]

S.Shanmugapriya et al. (2015) studied key quality factors for Indian construction industry. She conducted survey for 49 different factors, ranked those collected data using Relative importance index (RII) n method from that, top five factors were conformance to code and standards, quality documents, satisfying customer needs, updating the knowledge, planning and managing human resource. [14]

Saraf D.D et al. (2015) stated that success of the project based on its performance. To found about the factors he distributed the questionnaires to project participants. He analysed the collected data, used Relative importance index (RII) method. He found that improper planning, site management, decision-making, shortage of labours and shortage of materials were the top five factors according to the owner. Same way improper design, shortage of labours and technical person, construction methods, site management and shortage of material were the factors according to engineer. According to contractor construction methods, improper planning, site management, construction mistakes and productivity were the key factors. [12]

Sumesh sudhir babu et al. (2015) in his study stated that critical success factor could be group in seven categories. Which are project management factor, procurement factor client related factors team related factors contractor related factors project manager related factors and business-work environment related factors added that identification of critical success factors (CSFs) would be handy for the actual management for all type of projects. [13]

Soren Linhard et al. (2016) studied 25 key process factors, ranked using Relative importance index (RII) method. Owner, contractor and consultant were the participants. For owner based on his study consistent and correct project document external accumulation and sharing experience procedure for experience gathering, satisfactory use of information sharing well-functioning communication were the important factors in following order. Now for Consultant external build up and sharing of experience well-working communication consistent and correct project document adequate use of knowledge sharing, sharing knowledge at the point when requested were the accompanying components. For contractor's stable and precise project document external accumulation and sharing experience, well-working communication precise and stable tender document procedure of experience gathering were the following factors. [15]

T. anoop et al. (2016) stated that performance of the construction project should be evaluate on the basis of cost , quality , site dispute , safety , project time and environmental impact. To reach the above result he conducted survey and analysed the data using Pearson's correlation and regression analysis. [17]

Anindhayaguna adhiprasangga et al. (2016) developed balance scorecard using KPIs to measures state-owned enterprise. Author use key performance indicators (KPIs) in four different perspectives, which were finance, customers, internal process, learning and growth. [2]

The following table 1 shows the factors affecting infrastructure project performance.

Table: 1 Factors affecting Infrastructure Project Performance

| No. | Factors | Author/Year | | | | | | |
|-----|---|-------------|-----------------|---------------------|-----------------|------------------------------------|--------------------|------------------------|
| | | Lui (2013) | Donghoon (2013) | Murut Dunduz (2015) | T. anoop (2015) | Anindhayaguna Adhiprasangga (2016) | Hany M. Ali (2012) | Isabel M. Horta (2010) |
| 1 | Financial Factor | | * | | | * | * | |
| 2 | Time factor | | | | * | | | |
| 3 | Internal Business Process Factors | | * | | | * | * | |
| 4 | Client Factors | | * | * | | * | * | * |
| 5 | Learning , Growth and Innovation Factors | | * | | | * | * | |
| 6 | Health , Safety and Environmental Factors | * | | | * | | | * |

(*) indicate major finding from literature review

III. CONCEPTUAL FRAMEWORK

Based on the following literature review the new conceptual framework of factors affecting infrastructure project performance. Here in framework, six main criteria defined, based on critical literature review. These criteria are financial factors, Client factors, Time factors, Internal Business Process Factors, Client factors, learning growth and Innovation factors, Health safety and Environmental factors. All these main criteria have their own sub-criteria, which drive these 6 main factors. In general, there are total 40 sub criteria, which drive the main criteria. Financial factor have 10 sub criteria, Time factor have 5 sub criteria , Internal Business process have 8 sub criteria , Client factor have 4 sub criteria ,Learning growth and Innovation have 8 sub criteria ,Health safety and Environmental have 5 sub criteria. Here each sub criteria affect the infrastructure project performance directly or indirectly. Following fig 2 is the whole framework for factors affecting infrastructure project performance.

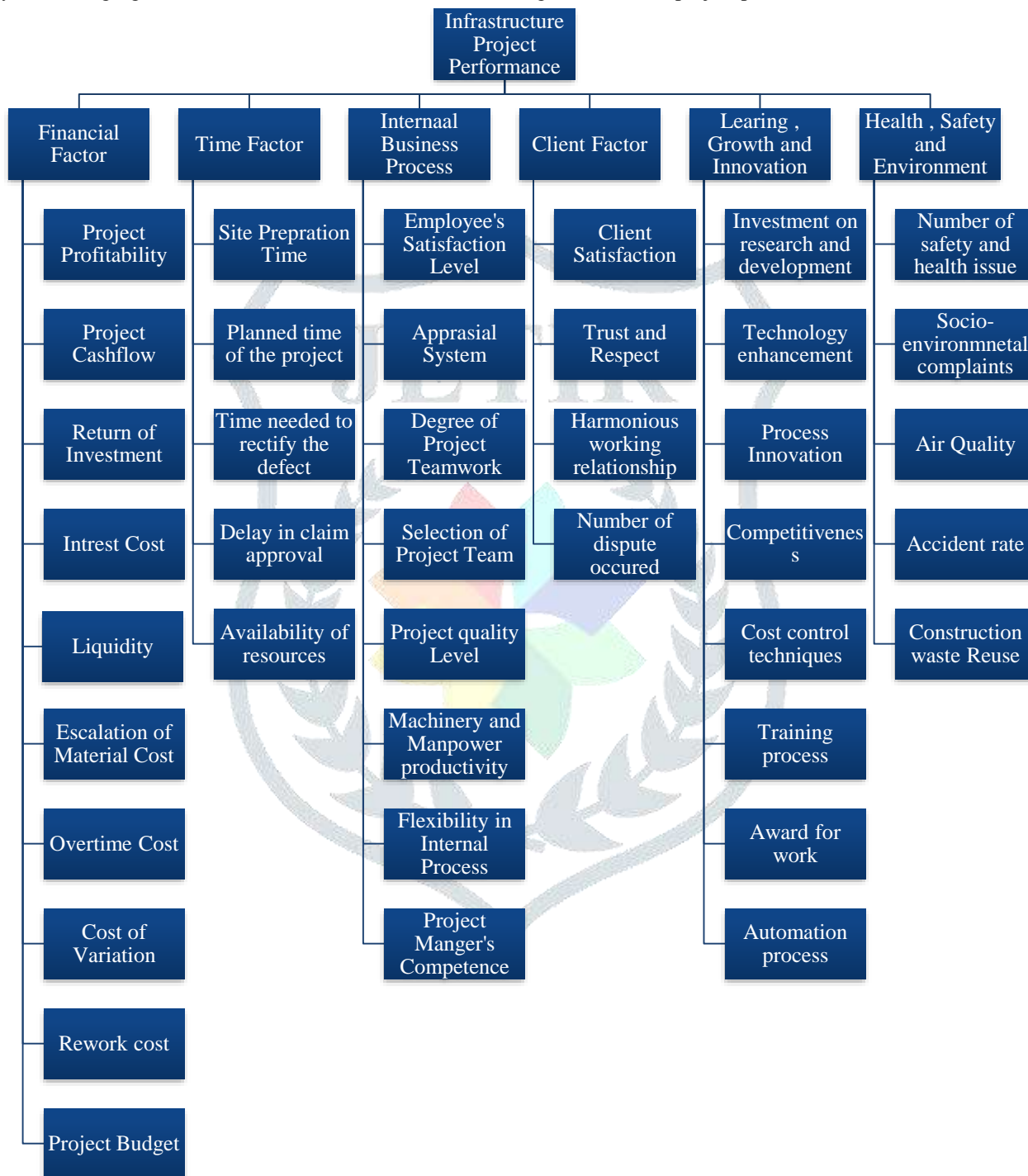


Fig 2: Framework of factors affecting Infrastructure Project Performance

IV. CONCLUSION

Based on critical literature review the following conclusion drawn:

1. Infrastructure project perform well when project manager take care of financial factors, time factors, internal business factors, client factors, innovation, health safety and environmental aspect of that project. These all the factors effect on the project performance on different level and at the different stage of the project life cycle.
2. Financial parameters are not the only criteria to measure performance of the project.
3. Iron triangle: Time, Cost and Quality is not the only parameters to meet the success of the project.

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