

STUDY THE DIFFERENT ELEMENTS OF CONSTRUCTION MANAGEMENT FOR REDUCING DELAY AND COST

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Abstract - India has been rapidly developing homes and infrastructure for the last decade. Delays in building projects are prevalent and severely damage projects in numerous ways. Material shortages and delays in material availability are major causes of building project delays internationally. However, the major underlying reasons vary every country. The main source of material shortage is the origin or availability of materials. However, inefficient materials procurement and inventory management systems, as well as late identification of the materials needed, were revealed to be the leading causes of material delivery delays. The observations were supposed to help formulate or revise critical policies to ensure project completion on time. Cost overruns, time overruns, contract cancellation, arbitration, and litigation are studied successively. The increasing prevalence of project delays is directly influencing the timely delivery of construction projects. Corrupt practices, lack of quality materials, incorrect design, slow delivery of materials, slow approval and receipt of completed project work, improper site management and performance, late budget/fund release, and ineffective project planning and scheduling should be investigated as influential causes of delay. This study assesses the impact of construction delays and possible solutions.

size. Labor performance, in particular, is influenced by various factors such as time, cost, resources, disputes, materials, and quality. Inefficient management of construction resources can lead to low productivity. Therefore, construction managers should be knowledgeable about methods to evaluate equipment and labor productivity across different crafts. To achieve the expected outcomes from construction projects, it is essential to effectively control productivity factors, including SCM, labor, equipment, cash flow, and more. Among these resources, labor productivity plays a significant role. A better understanding of the factors impacting productivity enables managers to allocate limited resources more effectively, provide better support to workers, and enhance their motivation.

Delays in the construction industry have critical effects, including cost overruns, time overruns, contract terminations, arbitration, and litigation. Delay management is a key factor responsible for project delays, which directly affects the timely delivery of construction projects. Therefore, it is important to investigate the influential causes of delays, such as corruption, unavailability of utilities at the site, inflation or price increases in materials, lack of quality materials, incorrect design, slow delivery of materials, delays in project approval and completion, inadequate site management and performance, late release of budget/funds, and ineffective project planning and scheduling. This study aims to evaluate the impact of delays on construction projects and propose remedial measures to prevent delays in the Indian construction industry

1. INTRODUCTION

A supply chain can be defined as a network of organizations involved in various processes and activities that create value through the production of products and services for the end consumer (Christopher, 1998).

Supply chain management refers to the efficient planning, implementation, and control of operations within the supply chain. It encompasses the planning and management of all activities related to sourcing, procurement, conversion, and logistics management (Hu, 2019).

In the construction industry, the supply chain focuses on the planning and coordination of material, equipment, and personnel movement from supply points to the construction site. The objective is to ensure that the necessary materials are delivered to the site for the assembly of the final product.

Christopher's definition from 1998 provides a clear and organized explanation of supply chain management (SCM), highlighting its fundamental purpose. The construction industry faces numerous challenges, particularly related to productivity issues. Productivity is a crucial factor that affects the overall performance of organizations, regardless of their

2. METHODOLOGY

Research Framework

1. To study the literature review to know about present scenario of Infrastructure projects and conduct open interviews.
2. Define the objective based on the necessity concluded from present scenario.
3. Preparation of set of questions based on literature review, survey of the SCM, Material, labours, and for conducting the questionnaire survey focused on defined objective.
4. Interviews and discussions with labours to validate the factors like disputes, resources, material chain and time-cost management.
5. Analysis of data, by relative importance index method, obtained from the Questionnaire survey to rank the attributes frequently affecting the performance of the project.
6. Analysis of data, by relative importance index method, obtained from the Questionnaire survey to know the impact of attributes on the project affecting the performance of the project.

7. Productivity and recommendation through casestudy.

SURVEY DETAILS

R-II Calculation

$\Sigma W=40$

$\Sigma W= 3 \times n3 + 2 \times n2 + 1 \times n1$

$\Sigma W = 3*5+2*3+1*4= 25$ respondent

15% Respondent = 0.15

Table 1 factors of organization supply chain collaboration by RII method

Sr.No.	Factors	RII	Rank
01	Benefits to the client	0.7833	3
02	Benefits to your supplier	0.7667	5
03	Increased profitability	0.7667	6
04	Improved customer services	0.8833	1
05	Reducing paper work	0.7833	4
06	Improved quality assurance	0.8667	2
07	Cost reduction within your organization	0.7667	7

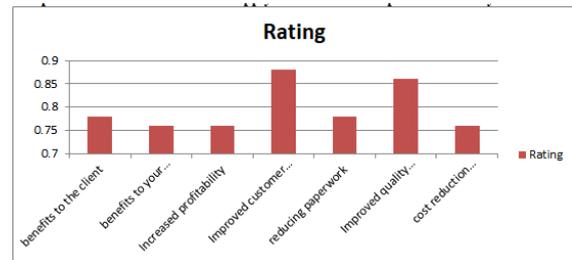
Table 2 Factors of successful supply chain relationship with clients by RII method

Sr.No	Factors	RII	Rank
01	Trust	0.7833	6
02	Mutual interest	0.6833	8
03	Top management support	0.8500	2
04	Manpower Development	0.8000	4
05	More frequent meeting	0.7333	7
06	Free flow of information	0.8000	5
07	Reliability of supply	0.8167	3
08	Creating standardization of process	0.8667	1

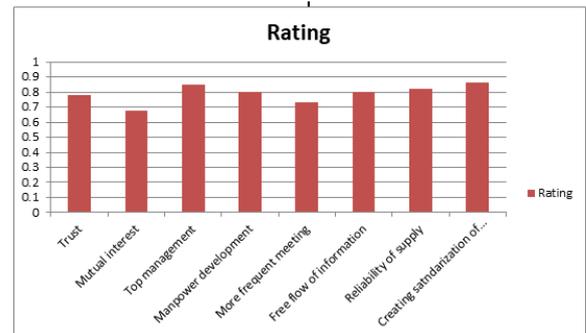
Table 3 Beneficial factor of supply chain management by RII method

Sr.No	Factors	RII	Rank
01	Increase sales	0.8000	6
02	Cost saving	0.8667	1
03	Increased coordination with supplier	0.7833	9
04	Increased coordination with client/contractor	0.8167	4

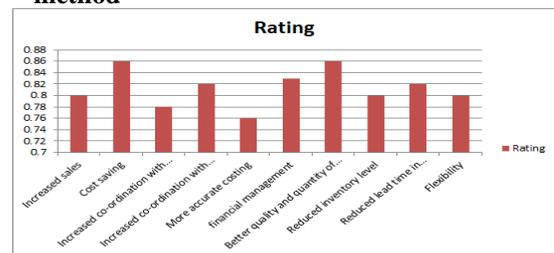
05	More accurate costing	0.7667	10
06	Financial Management	0.8333	3
07	Better quality and quantity of information	0.8667	2
08	Reduced inventory level	0.8000	7
09	Reduced lead time in production	0.8167	5
10	Flexibility	0.8000	8



Graph 1. Factors of successful supply chain relationship with clients by RII method



Graph 2. Factors of successful supply chain relationship with clients by RII method



Graph 3. Beneficial factor of supply chain management by RII method

3. RESULTS AND DISCUSION

The questionnaire was circulated across large construction projects, including site engineers, Painter, Plasterer, Meson Brickwork, steel binder, and the employee workforce, as well as small construction projects.

The findings summarized and the author's influence measured, grouped into seven categories of factors affecting the Cost and Time efficiency of construction workers at the construction site, as follows:

Table 4: Ranking of factors on workers themselves

Factors	RII	Impact	Ranking
Experience of workers	4.29	Very high	5
Labour Discipline	4.12	Very high	5
Physical ability	4.01	High	4
Psychophysiology ability	3.78	High	4
Labour Intensity	3.52	Mid	3
Age	3.41	Low	2
Gender	3.19	Extreme Low	1
Level of training	3.09	Extreme Low	1

The lower the labor rate, the lower the productivity, the human being's physiological psychological problems would have an effect on the standard of work, thereby impacting productivity. The higher the age, the more experience is acquired, however physical strength can be reduced, thus greatly affecting labor productivity.

Table 5: Ranking of operational and managerial factors

Factors	RII	Impact	Ranking
Ability to organize production	4.23	Very high	5
Construction supervision	4.20	High	4
Application of technology	3.92	Mid	3
Workers' arrangement	3.73	Low	2
Labour's Communication	2.89	Extreme low	1

The ability to organize production is the leading influence with RII= 4.23, and the organization of construction supervision with RII= 4.20 is ranked second. It can be seen that the capacity to organize and oversee the construction of contractors, especially the site manager, can decide management and organization, development and direct construction on the site. These have a clear effect on the increase or decline in labour production and have a major impact on it. With RIIs being 3.73 and 3.92, the factors to be calculated with a high degree of control are the application of technologies and worker structure. That is to say, from the viewpoint of workers, technologies and labor agreements contribute significantly to their performance.

Table 6: Ranking of factors that motivate employees

Factors	RII	Impact	Ranking
Types of salary payment	4.27	Very high	5
Staff Support	4.05	High	4
Reward Mechanism	3.69	High	4
Spiritual Life	3.58	Mid	3

Training and improving skills	3.32	Low	2
Initiative at work	3.18	Extreme low	1

Factors that have a high effect on time & cost efficiency include skilled training, skills upgrading and innovation. These variables directly impact employee motivation, taking work to the satisfaction and sense of obligation of construction workers.

Table 7: Ranking of factors of working tools and objects

Factors	RII	Impact	Ranking
Quality of building materials	4.25	Very High	5
Quality of working tools	4.01	High	4
Complexity of works	3.72	Low	2
Material transport methods	3.02	Extreme Low	1

The difficulty of the work with RII = 3.78 and the material transfer methods with RII = 3.22 are high-impact variables. These factors influence job efficiency, which, as stated, would also impact of new construction materials. Organizations need to use machinery, equipment and resources that must be appropriate for goods and technology in order to ensure the achievement and growth of productivity; ensure regular readiness and service during the work shift; ensure that raw materials and semi-finished products put into production must have obvious origin and qualification.

Table 8: Ranking of natural environmental factors

Factors	RII	Impact	Ranking
Weather conditions	4.82	Very High	5
Regulations,	3.42	High	4
Geological and hydrological conditions	3.27	Mid	3
laws on construction	3.12	Low	2
	3.02	Extreme Low	1

4. CONCLUSIONS

The results from calculations of RII Method from different stakeholders' point of view indicate that the most important factors affecting SCM in construction firms are:

These are the following major factors to the organization supply chain collaboration: Improved customer services, improved quality assurance and benefits to the client.

These are the following major factors that affect the development of a successful supply chain relationship with clients: Creating standardization of processes, top management support and reliability of supply.

These are the major factors that benefit to using Supply chain management: Cost saving, better quality and quantity of information and financial management.

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