

# Study of Factors Affecting Performance of Construction Project

Saraf D. D.<sup>1</sup>

<sup>1</sup>Sant Gadge Baba Amravati University, M.E scholar, Prof. Ram Meghe College of Engineering & Management, Badnera, Amravati, Maharashtra, India

**Abstract:** *Success of a construction project depends on its performance. There are many factors affects performance of construction resulting into delay in construction or failure in construction. The objective of this paper is to identify the factors affecting performance of construction project in Amravati and to elicit perceptions of their relative importance. A total of 100 questionnaires were distributed to 3 key groups of project participants; namely owners, contractors and engineers. A comprehensive literature review was deployed to generate a set of factors believed to affect project performance. The survey findings indicate that all 3 groups agree that the most important factors affecting project performance are: improper planning, improper designing, site management, decision making, construction methods, shortage of labor and technical personnel, quality and shortage of materials, construction mistakes and defective work, productivity and to overcome all these factors suggestions are made.*

**Keywords:** performance, factors, respondent, project.

## 1. Introduction

Success of construction project depends on its performance. Construction divides in three phases, pre-construction phase, construction phase and post-construction phase. Construction itself very time consuming process also success of construction depends on its performance. There are many factors that obstruct performance of construction cause delay in construction or failure in construction.

The survey findings indicate that the most important factors affecting project performance are: delays because of materials shortage; unavailability of resources; low level of project leadership skills; escalation of material prices; unavailability of highly experienced and qualified personnel; and poor quality of available equipment and raw materials (A. Enhassi. 2009).

The construction industry is generally considered to have underperformed compared to other industry. Not only that, the some construction industry has been criticized for not performing at the same level as that of other developed countries. In relation to this, working groups on key performance indicators (KPI) have identified ten parameters for benchmarking projects, in order to achieve a good performance in construction industry (R. Takim. 2002).

Many construction industry sectors have been experiencing chronic problems such as poor safety, inferior working conditions and insufficient quality. These problems have been identified as factors that affect construction productivity and will affects companies performance (S. Alwi. 2003).

The success of construction project depend on its performance, which is measured base on timely completion, within the budget, required quality standards and customers satisfaction (A. Omran.2012).

In the ever-evolving field of construction where project managers strive to deliver successful projects, there is often an absence of standard benchmarks for evaluating the

projects performance and success. The success of a project has been defined and the projects performance gauged in a plethora of ways by the different clients over the course of time, while some use the conventional performance measures, such as time, quality and cost of the projects for project evaluation, other turns towards non conventional measures., such as stakeholders interests, environment, health and safety, etc. Therefore, there is need for identifying the key measures of performance that are used commonly in the field of construction and that constructions organizations need to develop systems and process to measure in order to satisfy a wide variety of clients (S. Bhatti. 2013).

Project cost is one of the most important criteria of success of project and is of high concern to those who are involved in the construction industry. However, studies show that rarely projects are complete within stipulated budget (A. Memon. 2010). Performance measurement received substantial attention from researchers and the construction industry over the past two decades, thus awareness of the importance of the use of appropriate performance measures and its role in supporting the application of lean construction concepts (S. Sarahan. 2013).

Following this, the paper reports on the findings of a survey targeting project owners, contractors and engineers, in an attempt to shed some light on how each project party perceives the relative importance of these factors. Finally, the paper formulates a number of recommendations in order to bridge the gap between the different perceptions thus improving the level of project performance.

## 2. Methodology

A questionnaire survey was used to elicit the attitude of owners, contractors and engineers towards the factors affecting the performance of construction project in Amravati. Questionnaires were sent to randomly selected owners, contractors and engineers. 100 questionnaires were distributed as follows: 30 to owners; 30 to engineers; and 40 to contractors. 65 were received (Response rate of 65%) as

follows: 15 (50%) from owners; 20 (66%) from engineers; and 30 (75%) from contractors as respondents. The respondents were asked to indicate, based on their local experience the level of importance of each one of the

**Table 1;** Summary of relative importance index and rank for factors affecting the performance of construction projects.

identified 20 factors of performance on a five-point Likert scale as: not important, slightly, moderately, very, and extremely important.

Sr No	Factors	Owner		Contractors		Engineers	
		RII	RANK	RII	RANK	RII	RANK
1	Improper Planning	0.92	1	0.89	7	0.86	2
2	Improper Designing	0.56	10	0.95	1	0.73	10
3	Contract Management	0.51	14	0.7	16	0.76	7
4	Decision Making	0.86	3	0.64	17	0.76	7
5	Improper Communication	0.55	11	0.82	8	0.67	14
6	Site Management	0.9	2	0.92	4	0.85	3
7	Construction Methods	0.54	13	0.93	3	0.87	1
8	Complexity Of Project	0.43	16	0.79	10	0.62	17
9	Quality Assurance	0.65	8	0.76	13	0.69	12
10	Quality & Shortage Of Material	0.8	5	0.92	4	0.66	15
11	Shortage Of Labor & Technical Personnel	0.85	4	0.95	1	0.79	5
12	Availability Of Equipments & Failure	0.79	6	0.79	10	0.68	13
13	Unforeseen Site Condition	0.28	20	0.44	19	0.37	20
14	Attitude Of Site Personnel Towards Work	0.4	17	0.78	12	0.65	16
15	Weather Condition	0.32	19	0.38	20	0.42	19
16	Finance & Payment Of Completed Work	0.78	7	0.9	6	0.76	7
17	Major Disputes & Negotiation	0.34	18	0.49	18	0.55	18
18	Productivity	0.65	8	0.72	14	0.79	5
19	Construction Mistakes & Defective Work	0.55	11	0.81	9	0.83	4
20	Client's Satisfaction	0.45	15	0.72	14	0.73	10

The questionnaire has been validated by the criterion-related reliability test which measures the correlation coefficient between the factors affecting the performance of construction projects in one field and the whole field. The respondents were experienced owner, site engineers/office engineers and contractors (with average experience of 20 years in the construction industry). 20 factors believed to affect project performance were considered in this study and were listed under 3 groups based on the literature reviewed (A. Enhassi. 2009; R. Takim. 2002; S. Alwi. 2003; A. Omran. 2012; S. Bhatti. 2013; S. Sarahan. 2013). The performance factors were summarized and collected according to previous studies and others as recommended by local experts. The main groups considered in this paper are factors affecting performance of construction in its progress phase includes pre-construction phase, construction phase and post-

construction phase and according to these groups factors are sorted out. The relative importance index method (RII) was used herein to determine owners, contractors and engineers perceptions of the relative importance of the identified performance factors. The RII was computed as (A. Enhassi. 2009):

$RII = \text{summation of } W / A * N,$

Where,

W is the weight given to each factor by the respondents and ranges from 1 to 5;

A is the highest weight = 5;

N is the total number of respondents.

### 3. Factors Affecting Performance of Construction Project

Table 1. Shows list of factors affecting performance of construction and group of respondent with the relative importance index and rank. All feedback from respondent tabulated and tries to find out critical factors which severely affect performance of construction. Perspective of each respondent different from each other and therefore result obtained from respondent vary from each other.

Table 2. Summarized critical factors sorted by owners, from the owners perspective improper planning, site management, decision making, shortage of labor and technical personnel, quality and shortage of materials are most important factors that affects performance of construction.

Table 3. Summarized critical factors sorted by contractors, from the contractors perspective improper designing, site management, shortage of labor and technical personnel, construction methods, site management, quality and shortage of materials are most important factors that affects performance of construction.

**Table 2:** Summary of relative importance index and rank, perspective of owner

Sr No.	Critical Factors By Owners Perspective	Rank
01	Improper Planning	1
02	Site Management	2
03	Decision Making	3
04	Shortage Of Labor & Technical Personnel	4
05	Quality & Shortage Of Material	5

**Table 3:** Summary of relative importance index and rank, perspective of engineer

Sr No.	Critical Factors By Contractors Perspective	Rank
01	Improper Designing	1
02	Shortage Of Labor & Technical Personnel	1
03	Construction Methods	3
04	Site Management	4
05	Quality & Shortage Of Material	4

Table 4. Summarized critical factors sorted by engineers, from the engineer's perspective construction methods, improper planning, site management, construction mistakes, shortage of labor and technical personnel, productivity are most important factors that affects performance of construction.

**Table 4:** Summary of relative importance index and rank, perspective of contractor.

Sr No.	Critical Factors By Engineers Perspective	Rank
01	Construction Methods	1
02	Improper Planning	2
03	Site Management	3
04	Construction Mistakes & Defective Work	4
05	Shortage Of Labor & Technical Personnel	5
06	Productivity	5

#### 4. Result and Conclusion

A questionnaire- based survey was used to elicit the attitude of owners, contractors and engineers towards factors affecting the performance of construction project. 20 factors were sorted and distributed to the respondent. The most important factors agreed by the owners, contractors, and engineers as the main factors affecting the performance of construction projects: improper planning, improper designing, site management, decision making, construction methods, shortage of labor and technical personnel, quality and shortage of materials, construction mistakes and defective work, productivity. The owners considered the client and technical factors to be more important than the operational ones. Development of human resources in the construction industry through proper and continuous training programs for construction performance enhancement. These programs can update participants' knowledge and can assist them to be more familiar with project management techniques and processes.

Engineers should perform their activities properly to improve productivity which helps improvisation of construction projects.

Contractors should not increase the number of projects that cannot be performed successfully. Proper motivation and safety systems should be established for improving the productivity performance of construction projects. Contractors are counseled to minimize waste rates through project implementation for improving cost. They should be more interested in conformance to project specification to overcome disputes, time, and cost performance problems. Quality materials should be of a greater interest for contractors in order to improve cost, time, and quality performance. This can be done by applying quality training and meetings that are necessary for performing an improvement. Contractors are urged to be more interested in sequencing of work according to schedule. In addition, contractors should have a cost engineer in their projects to successfully control costs and improving in performance of construction.

#### 5. Acknowledgments

The author likes to acknowledge the support given by all respondents from various construction industry; builders, contractors and engineers that made this research possible.

#### References

- [1] Enhassi, (2009). "Factors affecting the performance of construction projects in the Gaza Strip". Journal of Civil Engineering and Management, vol. 15(8), pp. 269-280.
- [2] R. Takim,(2002). "Performance indicator for successful construction project performance". Association of Researchers in Construction Management Conference, vol. (2), pp. 545-55.
- [3] S.Alwi,(2003). "Factors influencing construction productivity in the Indonesian context". Proceeding of the Eastern Asia Society for Transportation studies, vol. (4), pp. 1557-1570.
- [4] Omran,(2012). "Project performance in Sudan construction industry ". Academic Research Journal, vol. (1), pp. 55-78.
- [5] S. Bhatti,(2013). "Performance measurement in construction project management".
- [6] S. Sarhan,(2002). "Performance Measurement in the UK Construction Industry and its role in Supporting the Application of Lean Construction". Australasian Journal of Construction Economics and Building, vol. 13(1), pp. 23-35.

#### Author Profile



**Darshan D. Saraf** received the B.E. in civil (2012) and M.E. in Construction Engineering & Management (perseaving) degrees from R.S.T.M.N.U and S.G.B.A.U respectively.