International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 04 | Apr 2020 www.irjet.net p-ISSN: 2395-0072

FACTORS INFLUENCING IN CONSTRUCTION INDUSTRY

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Abstract – *Construction Industry is one of the emerging industries of today that has a great impact on the economy of any nation. Quality is considered as an important concern for project managers. Quality issues are a very disturbing event for a civil engineer. In this context, owners and engineers are alarmed by quality issues which have become more common than one can anticipate. This study mainly focuses on identifying and analyzing the factors which influence quality in construction. The identified factors from the literature are time management, availability of resources, financial issues, labors, environmental conditions, materials and equipment used, lack of safety, co-ordination of participants, design, lack of communication, selection of contractor, inspection, codes and standards, execution and top management support. This study also intended to provide every participant in construction industry necessary information needed to better manage the quality of a construction projects. Based on the identified factors a questionnaire survey was conducted to collect opinion from the construction experts. Then based on the survey, the identified factors were ranked by Pareto analysis. And the topmost five influencing factors identified are Labors, material and equipment handling, Time management, Environmental conditions and recourse availability.*

Key Words: Labors, Resources, environmental conditions.

1. INTRODUCTION

1.1 GENERAL

The construction industry plays a socio-economic development in our nation. The industry is a distinct sector of the economy which makes its direct contribution to economic growth like all the other sectors such as agriculture, manufacturing and services. It also provides basis upon which the other sectors can grow, by constructing the physical facilities required for the production and distribution of goods and services. The construction industry also has potential for generating activity and employment in other sectors of the economy such as manufacturing, transport, commerce and financial services owing to it interlink ages to other sectors.

Quality issues are a very disturbing event for a civil engineer. It was almost non-existent in the past. Structures were known for their durability, soundness and stability. They were expected to be permanent. In this context, owners and engineers are now alarmed by quality issues which have become more common than one can anticipate. Modern materials are said to have better quality and of substantially increased strength. There is also an improved understanding of structural analysis backed by sophisticated design technology. These technologies should have produced better and more durable structures. Unfortunately, it is not so.

Quality in construction industry is defined as 'meeting or exceeding the requirement of client/owners.

Quality in construction is related to

- Satisfying the specification mentioned in the contract
- Completing the project time
- Fulfilling the owner's requirement within budget
- Avoiding disputes claims and
- Ensuring the faculties performs its intended purpose.

1.2 ELEMENTS OF QUALITY

The basic element of quality in construction is

- Quality characteristics
- Quality of design
- Quality of conformance

A quality characteristic is related to the parameters with respect to which quality- control process is judged. Quality characteristic includes strength, colours, texture, dimension, height and etc. example in compressive strength of concrete, usability of concrete in slump, etc.

Quality of design refers to the quality with which the design is carried out. It initially related to meeting the requirement of the standard, functionally efficient and economical maintainable system.

Quality of conformance is referred to the degree to which the constructed facility confirmed the design and specification. Quality of conformance is affected by

- Field construction methodology
- Inspection

In this study, the factors affecting quality performance of construction projects were studied. It can be used to measure performance in construction projects. This will be a key component of any organization move towards achieving best practice in order to overcome the quality performance problem in the construction projects.

1.3 QUALITY MANAGEMENT IN CONSTRUCTION

The construction industry is typified by highly differentiated, fragmented and loosely structured system. Improving a quality system is the first step towards developing quality in construction industry. A quality system consists of the following,

- Quality policy
- Organization structure
- Procedures
- Training
- Quality manual

One of the definitions of quality is "to satisfy the needs of customers". The needs to be satisfied not only include the client but also an entire community into which the completed building ultimately integrates. Construction cost and time are also important characteristics of quality. All these should be properly addressed in designing the building and the outcome should be expressed unequivocally in drawings and specifications. Construction costs are grouped under many categories and one such is cost of quality.

1.3.1 Quality management system

Organizations will benefit from establishing an effective quality management system (QMS). The milestone of a quality organization is the concept of the customer and supplier working together for their mutual benefit. For this to become more efficiency, the customer-supplier interfaces must extend into, and outside of, the organization, beyond the immediate customers and suppliers.

1.3.2 Principal quality dimensions

The important principal quality dimensions are given below:

- Performance
- Features
- Reliability
- Conformance
- Durability
- Serviceability
- Aesthetics
- Perceived quality

1.3.3 Techniques of quality

There are seven Basic Quality techniques are as follows:

- Histograms
- Pareto Charts
- Run Charts
- Scatter Diagrams
- Control Charts
- Flow Charts
- Cause and Effect Diagrams

1.4 OBJECTIVE OF THE STUDY

The objectives of the present study are as given below:

- To identify and evaluate various factors affecting the quality performance of construction projects and to rank them.
- To suggest ways to improve the quality performance of construction projects.
- To help the future projects to reduce the construction defects, minimizing rework and enhancing safety.

1. 5 SCOPE OF THE PROJECT

In the modern construction level, quality is a major function in construction industries. This project helps the future projects to reduce the construction defect, minimizing rework and enhancing safety. The Quality management introduce a high-performance team atmosphere and a culture of continuous improvement, making it possible to work toward a zero-rework environment.

- To improve their products quality
- To minimize the rework
- Helps to meet the customer requirements
- Helps to raise the company' s image
- Minimum cost of rework
- Zero rework environment

1.6 IMPORTANCE OF THE STUDY

The need for achieving quality of the finished product in the building construction is very important. The high cost of buildings makes it necessary to ensure quality of the finished product. Quality is an important one for sustainability and customer satisfaction. So the construction industries, quality performance is considered as major for client satisfaction.

- There is need to develop a specified method to measure quality due to lack of quality measurement methods.

- It is noticed that there are a number of problems in the construction industry caused by bad quality control, and the situation deems to getting worse.
- Most of failures in contracting industries happened due to these problems.
- All construction industry level of projects first understands the quality criteria and its impacting factors will make it possible to handle the quality problems much better.

2.RESULT AND DISCUSSION

2.1 QUESTIONNAIRE ANALYSIS

From literature studies, 15 factors were identified and a total of 75 questions were prepared as 5 questions for each factor. The questionnaires were distributed to around 43 companies in and around Trichy. The questionnaires were distributed to owners, contractors, consultants and supervisors in various companies. As a result, 25 respondents were obtained. From the questionnaire survey, the percentage variations between the factors were calculated and the topmost influencing factors are identified.

2.2 DATA ANALYSIS

The figures 2.1 to 2.15 show the percentage of respondents and the variations between various factors. According to the questions, the not agree factor must be taken into account, whereas it has very low percentage and is negotiable and less agree is taken for calculating results.

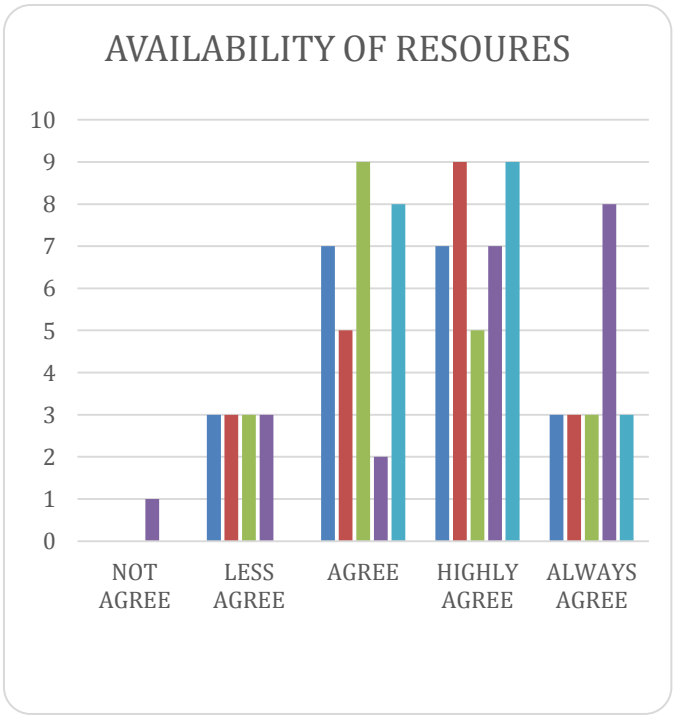

Fig 2.1 Percentage of Availability of resources

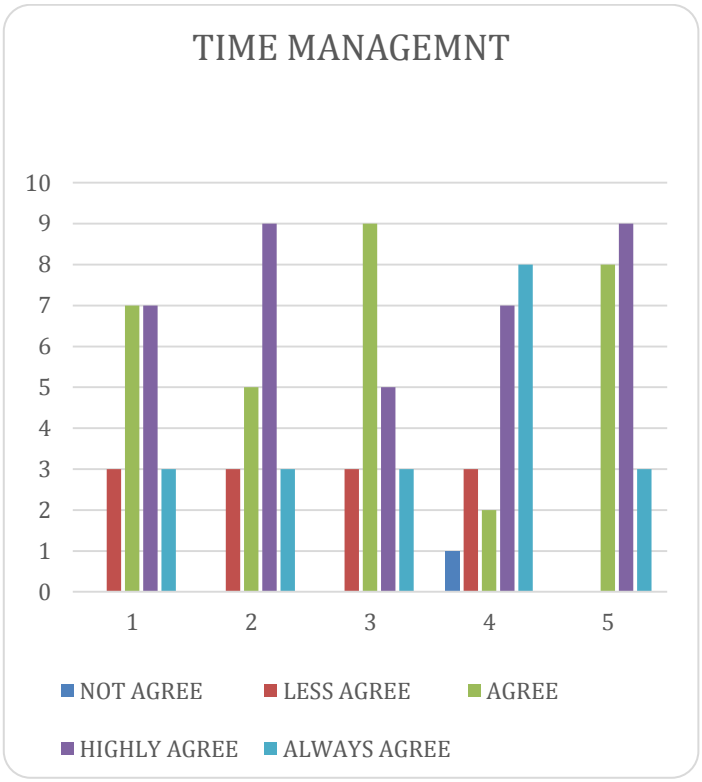

Fig 2.2 Percentage details of Time management

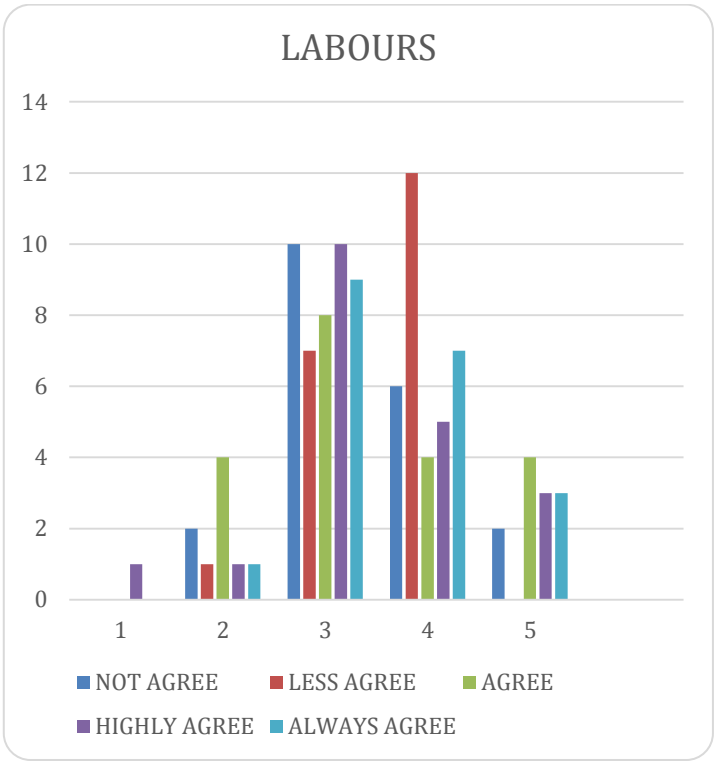

Fig 2.3 Percentage details of Labours

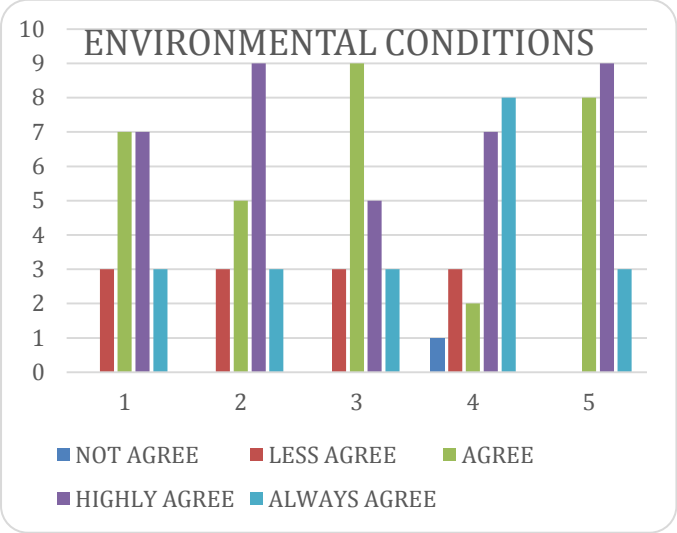

Fig 2.4 Percentage details of Environmental conditions

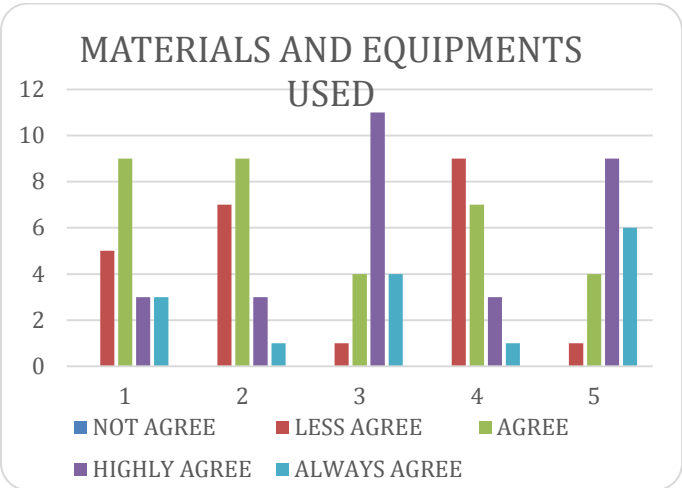

Fig 2.5 Percentage details of Materials and equipment used

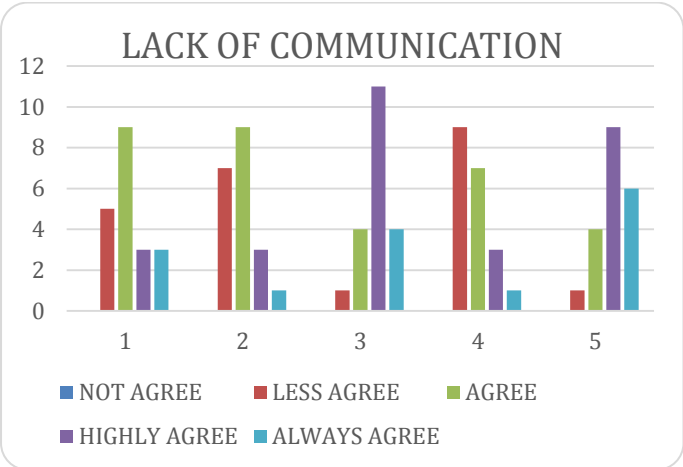

Fig 2.6 Percentage details of Communication

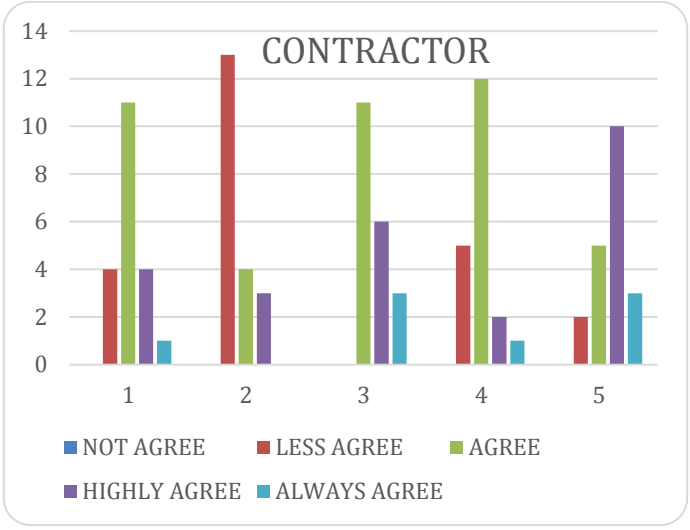

Fig 2.7 Percentage details of Contractor

Fig 2.8 Percentage details of Inspection

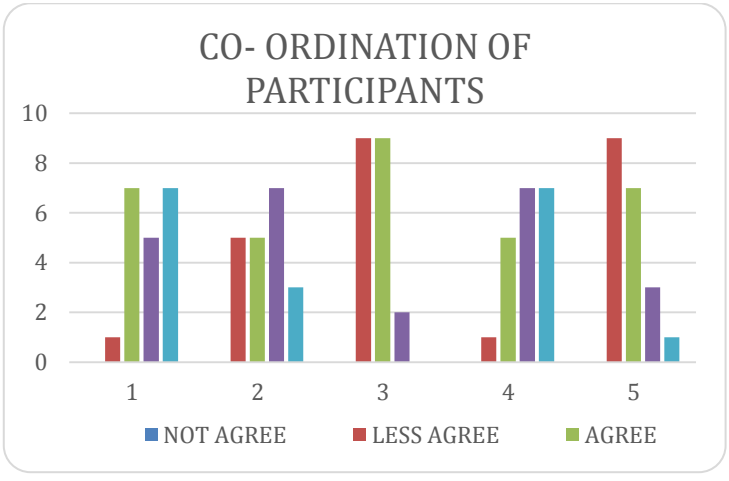

Fig 2.9 Percentage details of Co-ordination of participants

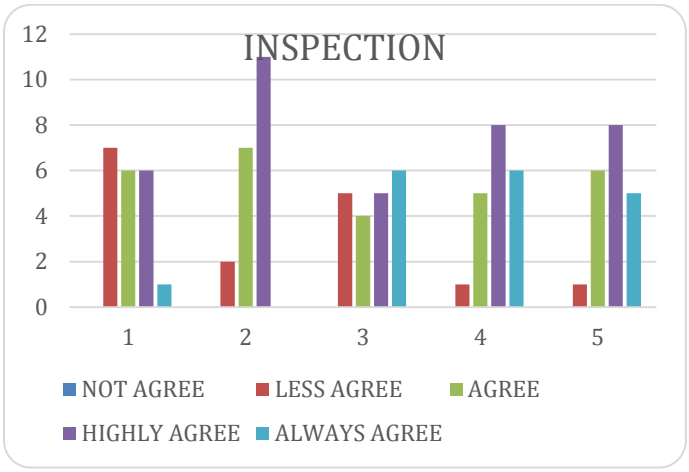

Fig 2.10 Percentage details of Execution

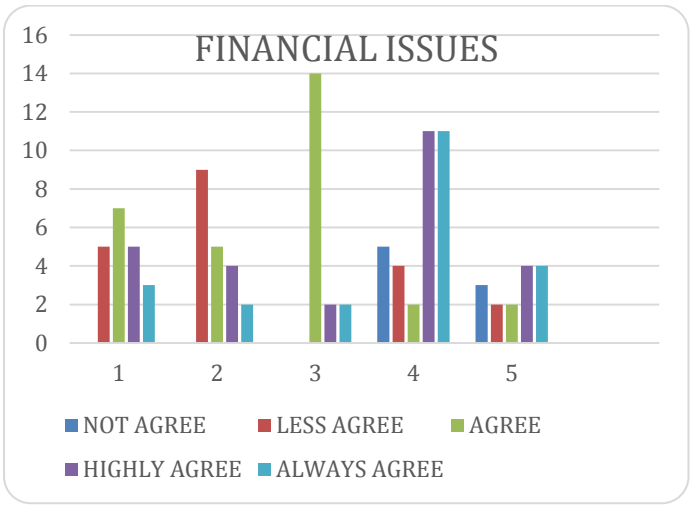

Fig 2.11 Percentage details of financial issues

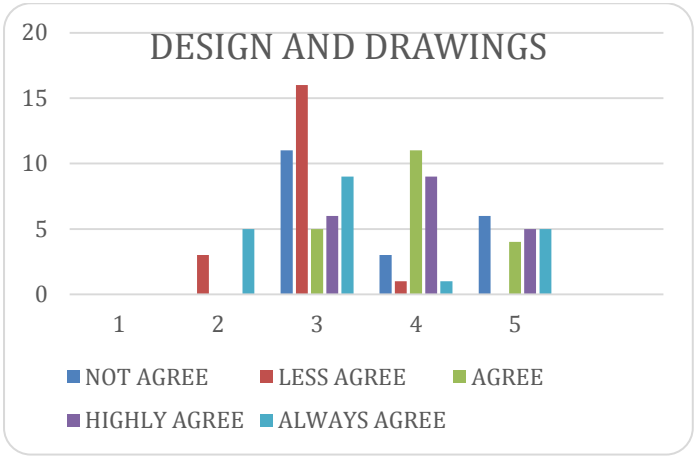

Fig 2.12 Percentage details of Design & drawings

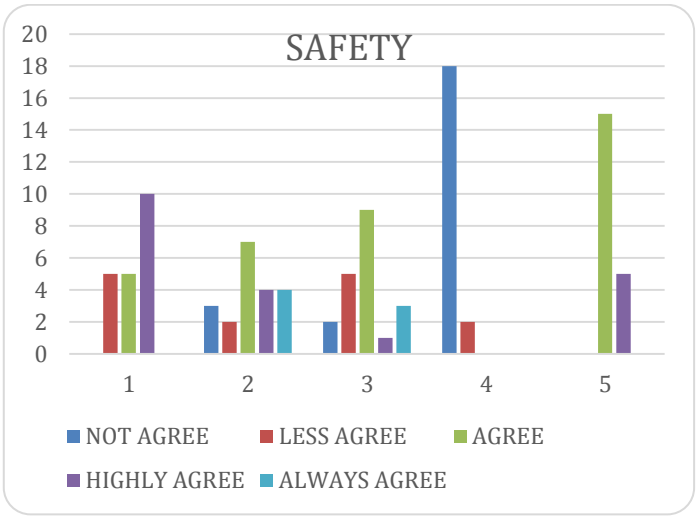

Fig 2.13 Percentage of Safety

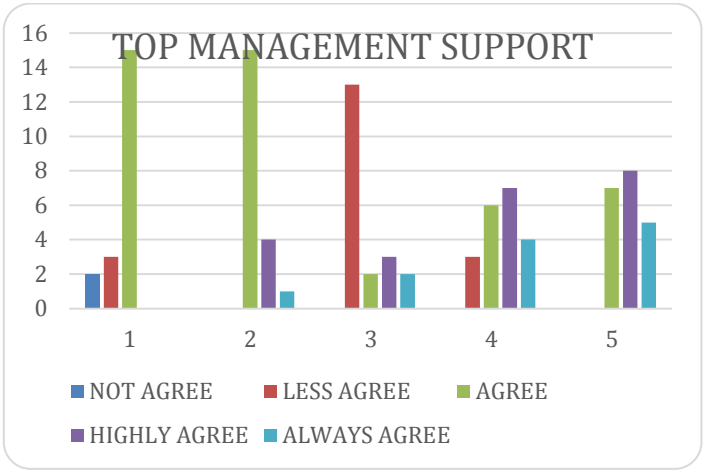

Fig 2.14 Percentage of Top management support

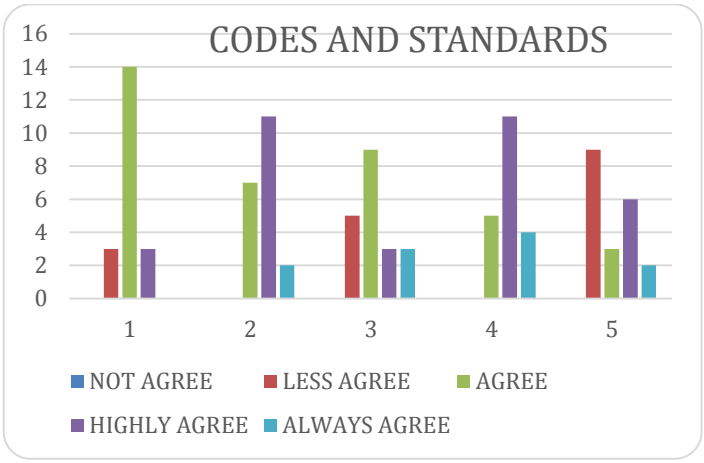

Fig 2.15 Percentage of codes and standards

The figure 2.16 shows the percentage variations of the top five factors among them which influences quality in construction projects and their corresponding percentage as labors (24%), availability of resources (16%), time management (20%), environmental

conditions (18%) and materials & equipment's used(22%).

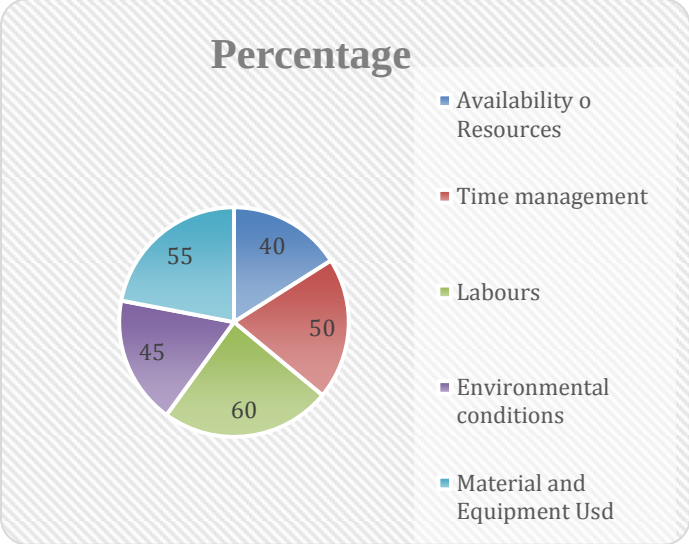

Fig 2.16 Percentage variations of 5 factors

The figure 2.17 shows the percentage variation of top Five factors and they are arranged here in the order of ranking i.e. topmost influencing factors first. They are Labors, Materials & equipment used, Time management ,Environmental conditions And Availability of resources .

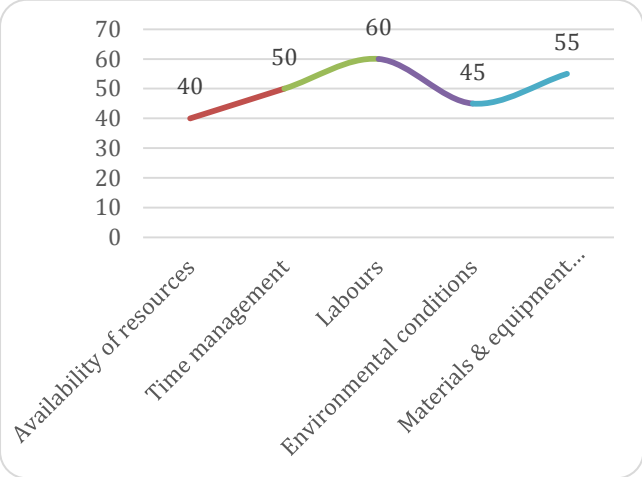

Fig 2.17 Percentage variation of 15 factors

7. CONCLUSION

Quality planning is required for any projects where recognized local, national or international standards are required in order to achieve project goal. In this process considered during the project plan evaluation process and develop the overall project management planning. A improper quality plan, creates the risk of making mistakes in industry, one of which can be the failure to allow for costs or added delays required to ensure a quality standard is met.

From the above findings, the study concluded that the topmost influencing factors in construction projects are Recourses, Safety, Time management, materials, Environmental conditions and labors. Figure 2.17 shows the Pareto chart for the fifteen factors in which the factors are ranked based upon the cumulative percentage as Labors, Safety, Top management, Environmental conditions, Co-ordination of participants, Contractor, Inspection, Execution, Codes & standards, Availability of resources, Time management, Financial issues, Materials & equipment used, Design & drawings and Communication.

RECOMMENDATIONS

Here are some of the suggestions to improve quality in construction projects:

Identify all regulations and standards that are necessary to satisfy client internal company standards. Ensure that the project plan is updated to reflect the findings from the quality plan. With all the project management tasks, close interaction with all involved parties is essential.

Train the supervisors and the crew. Supervisor training should be specifically related to how to improve quality at the job site. Supervisors must be trained to look at the job not on a day- to-day basis, but as work process with any discrete steps that must be completed over an extended, if limited, period.

Selection of contractors should no longer be based mainly on speed of delivery, lowest cost or favoritism but rather should be based on competency and potential for performance and quality.

Enforcement of quality standards must be given urgent attention and those that will be appointed to enforce quality must be professionals with integrity.

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