

To Analysis the Need of the Change in Organization Structure for Metro Rail Projects

Mr. Bharangar Pravindra Kumar^{1*}, Dr. D. B. Jasutkar²

¹ PG Student, Dept of Civil Engg, PVPIT, Pune

² Professor, Dept of Civil Engg, PVPIT, Pune

Abstract - Management structure has prime importance in successful completion of the project in each branch. Metro project becomes more challenging day by day due to modern challenges. Management structure need to redefine to overcome these challenges. Metro projects are the giant project in the infrastructure which touches many streams like construction, management, mechanical, electrical, electronics etc. To manage all the mentioned streams and huge resources matrix management structure is the most suitable structure we have. That's why this matrix structure is adopted by all of metro project. But due to its size and dual nature, this management structure faces some issues. These issues may create significant problem if not treated well and can put the success of the project in danger. Main problems with this system are miscommunication, conflicts, power struggle. All these are non-technical and behavioral issues.

Keywords - Keyword- Metro, Matrix, Organisational behavior

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INTRODUCTION

Ideally metro management structure should effectively organize all its resources, reduce the risk associated and complete the project within time and the budget allotted. Matrix structure is best suited structure adopted in the metro project. Matrix structure is very complex. It is dual authority structure. In reality, management structure faces some issues which affect the overall productivity. Dispute, authority overlap, improper communication and coordination are the problems which affect metro project. These are structural and functional problem should resolve by some modifications or improvement in existing management . Construction project management structures are critical aspect affecting the overall outcome of a project and still one of the most neglected areas of research and development. Many Mega Infrastructure projects such as metro projects have failed to meet their specific goals in terms of budget & schedule. It also reveals that 59% and 67% of the project does not meet expectation in terms of cost and time respectively due to the effect of the organisational structure in place. Old management systems could not satisfy increased network level operations. Currently facing number of other problems, issue- Accountability, Overlapping of area of authority, Improper coordination. Project structures is critical aspect affecting the overall outcome of a project. All these problems can be solved by analyzing the present structure and adopting a more suitable project structure. As in management field, it is prime responsibility to overcome limitation and increase efficiency by improvement of management

structure. Improved project management structure that can affect- better project strategy, better risk allocation, efficient contract, lesser litigations, efficient and effective project execution.

Significance: work focuses on the managerial structure in Mega infrastructure projects such as metro project mainly. This thesis defines the advantages, disadvantages and the problem which arises during implementation of matrix structure. In this project, structure from management position and its subordinate positions are taken into consideration. Top management like board of director, chairmen, executive officer are not included in this project work.

LITERATURE REVIEW

V. Fernández, E. Diaz. 2018 "In this research paper various organisational structure, their advantages, disadvantage are discussed. Functional - There is no need to negotiate and compete with other areas for resources. Team members are familiar with each other since they work in the same area. Program areas may not have all of the specialists needed to work on the project. Team members may have other responsibilities in the program unit since they may not be full-time on the project. Pure project - The project manager maintains authority over the entire project. Advantages of this system are strong project control, centralized lines of communication, strong sense of project identification and good understanding of project goals. There are few

disadvantages of this system like it is costly, inefficient use of resources since several resources may be duplicated on different projects. Limited opportunities for knowledge sharing and professional growth since team members are dedicated to one project at a time.

Niyazuden 2018. Author of this paper suggests that each project face number of challenges which need to address properly. Some of the challenges are listed below A large number of stakeholders are involved in the metro project which results difficulties in communication. Change in the plan and requirement which leads to delay. Delay in decision making Some of the clauses of contract are impractical and ambiguous which results difficulty in administration Limited passage is available for construction due to heavy traffic and crowd.

S Rupa, M.S. Rani, 2017 Questionnaire survey is the easiest and fast method of data collection. There are five steps can be followed to design questionnaire form 1) Initial consideration, 2) Question response format 3) Questions layout 4) Pilot survey 5) Final questionnaire. Questionnaire can be open ended questionnaire in which respondent can answer by their own and in closed end questionnaire respondent needs to select the option already provided to him. Pilot test is conducted to test the effectiveness of the questionnaire. Pilot survey checks the validity, reliability and applicability. Face to face interview, telephonic interview, mail question and internet questions are the modes of reach target respondent to get responses.

Lin He1 2016 Old management systems could not satisfy increased network-level operations' The old management mechanism has shown strain in addressing large-scale rail transit operations and management. The other reason is the low efficiency of detailed job specialization in large scale operations that require quick responses. network-level operations require more collaboration among different divisions, a higher response rate, and a wider management region, and a more efficient and comprehensive management system.

Stephanie Grubenmann, 2016, functional matrix-function manager has more authority in this type while project manager has limited authority, employees remain under functional manager project matrix- Project manager has more authority in this type while functional manager has limited authority, employees remain under project manager. Functional manager offers technical expertise. Balanced matrix. - Project and functional manager both have equal authority and responsibility. Project manager oversee the project and functional manager provide technical expertise. Functional manager and project manager jointly takes the decision.

Ehab elkassas, 2013 Organisation type in all scales of projects must be well selected before starting execution. During construction phase selected manager and planner must re adjust the organisational

relations to have smooth execution according to their experience. The best is to choose the suitable planner, then the suitable manager, then the suitable organisation type and lastly the project team. Steps of selection of organisation are Type, requirement of speciality - define structure - selection of assistance - assign objective - team formation – authority, role and responsivity distribution - improve structure.

OBJECTIVES

- To identify problems and limitations of existing structure in Mega Infrastructure Projects such as metro project through questionnaires survey.
- To suggest improvements and modification in existing management structure.

DATA COLLECTION

Metro management structure is responsible for all operations or activities and its safely completion in metro project. Metro management involves General Consultant i.e., Project Management Consultant, Contractor, Designers, third party agency, Auditors and other stake holders for achieving the project objectives.

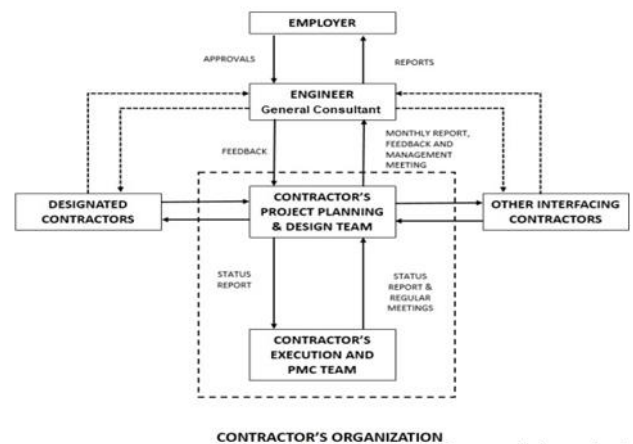


Chart 1: Organisation Chart: Interface

In General Consultant there are many designations from CRE (K1) to Site Inspector (K4) in each project station. Organisation chart for Station Team is given below for Reach 1 (R1) & Reach 2 (R2), where R1 is route from PCMC to Range Hill Depot and R2 indicates the route from Vanaj to PMC.

1. **CRE-** CRE stands for chief resident engineer. CRE manage both the route R1 and R2. CRE is responsible for timely and safely completion of both the route. K1 indicates its symbolic representation of the post.
2. **RE-** RE stands for resident engineer. There are two separates RE for both route R1 and R2. There is proper

coordination in-between both the RE. RE is responsible for planning, billing and report to CRE.

- Section engineer-** Section engineer is responsible for all the activity of different section under his authority. Section engineer has different role like check the BBS, check the measurement methodology, report to Resident engineer. For quantity surveying and structural steel design, Section engineer work in coordination with both RE for both the route.
- Site inspector-** Site inspector is last chain in the structure just above the labor. Site inspectors responsible for actual execution and inspection. There is separate site inspector for each distinctive site. Site inspector report to section engineer.

There is separate organisation structure under safety because safety is one of the main objectives to achieve. Following chart shows EHS organisation chart. EHS stands for environmental and health safety.

- Project in charge** – Project in charge is the Highest position on EHS and responsible for safety, health and environment of the whole project.
- Chief safety manager-** Chief safety manager primarily responsible for environmental and health safety of whole structure and personal. Chief safety manager controls all the senior safety manager from different department like electrical department, fire department, environmental department.
- Senior safety manager.** - Specially trained Senior safety manager controls respective division of their expertise. There is one separate safety manager allotted for each division. Senior safety manager reports to chief safety manager
- Assistant safety manager-** There are few assistance safety managers are assign to each division who are responsible for safely completion of different work under the division. Assistant safety manager reports to senior safety manager.
- Supervisor-** Main duty of supervisor is to carry the work safely under his supervision. Supervisor guide the worker to execute the work safely

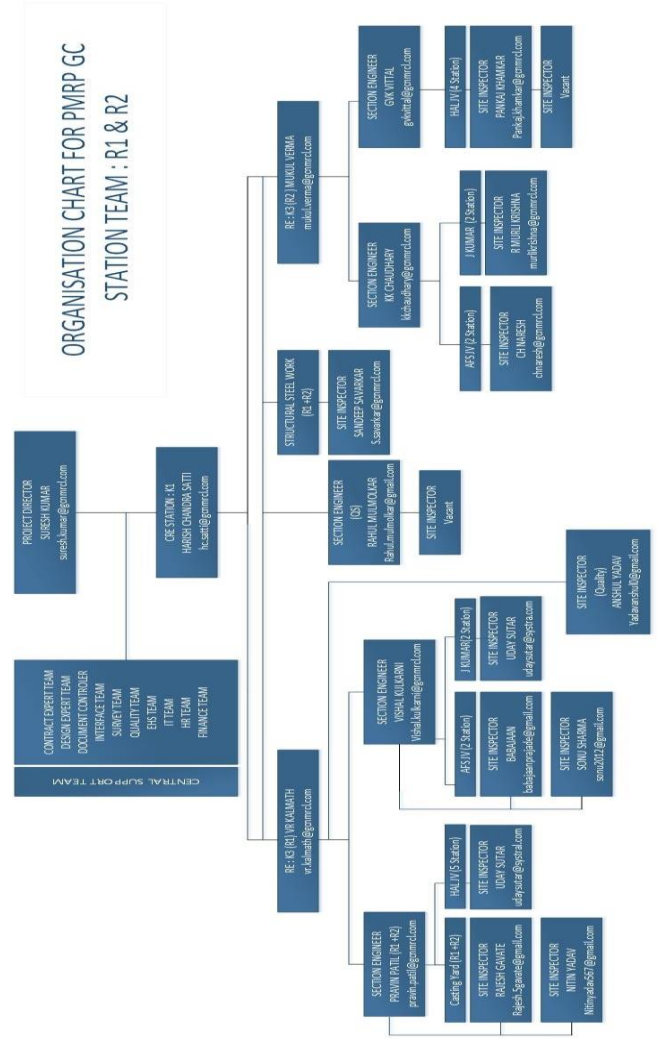


Chart 2: Organisation Chart: GC Station Credit: Maha-Metro

DATA ANALYSIS

Existing structure

Matrix structure is the most suitable structure for any major construction project. Matrix structure has many advantages compared to other structures hence it is used in most of the metro projects globally. Though it is the best structure for major construction projects, still there are few problems associated with this structure. Most of the projects failed to meet their specific goal. Time delay and **budget overrun are the two main problems project faces significantly. This calls for effective management of the projects. It is difficult to overcome all the limitation of the structure. But still there is significant chances of improvement. Research indicate that existing structure faces some issues listed below**

1. Improper communication and coordination
2. Distrust

3. Dispute
4. Lack of motivation and project spirit
5. Non alignment of the goal
6. Uncertainty in authority
7. Unclear roles and responsibility

All these problems are structural and functional in nature. These problem can be solved by adopting some structural and functional changes.

Proposed structure

To overcome the limitation of existing structure few changes are proposed in the existing management structure. These modification is categorised in two type, one is structural change and another is functional changes. These improvements are intended to improve coordination, monitoring and controlling mechanism. According to research, all parameter cannot be improved at a time because the complexity of the structure, so this research is focused on the few important parameter which causes problems in existing structure. These parameters are listed below

1. Communication and coordination
2. Team motivation & spirit.
3. Dispute resolution.
4. Accountability.
5. Roles & responsibility.

This research work doesn't address other considered parameter like risk management. project planning & scheduling, health & occupational safety with greater extent.

Functional changes

Some functional problems are associated with the existing matrix management structure. This problem can be overcome by some functional changes. Following method can be incorporated in the structure.

A) Responsibility-Authority balance.

Authority and responsibility should go hand in hand but this is not the case in many of the management structure. It is found that the responsibility overcomes the authority. This create the concertation of the power and shorten the border between roles and responsibility. This lead to power dispute which reported by many respondents. So in the proposed system both should be effectively balanced. Higher authority should be given for the higher responsibility and lesser authority should be given to lesser

responsibility. If the person is awarded with right authority, then he can reduce the timetaken for decision making. It can reduce the dispute and can enhance the commitment of the team. For example, quality engineer has the responsibility to maintain the quality of the work so the authority should be given to him to stop the work and improve the quality of the execution team if faulty workmanship is found. This change will distinguish the roles and responsibility which was unclear in existing structure and will create power balance

B) Documentation of problem-solving approach

Problem solving approach is the most important quality required in any complex activity. But in many cases this approach is not structured. If one is capable of solving the problem, then he can reduce the time and cost. Problem solving approach can enhance the speed of the work and can deliver higher income. Problem solving is the skill and everyone has different approach to see the problem, that's why problem-solving approach should be documented. This will prevent the loss of valuable solutions. This will also help in continuous improvement by studying, evaluating and improving the data generated by documentation. This data can be used for training purpose and can be implemented in execution level. The strong message will convey to the team member that their problem-solving skills are identified by the organisation and This will encourage the problem-solving approach in the team.

C) Reward system

New reward system should be implemented in the structure to encourage the team member. This reward should be based on the problem-solving approach & continues development and not based on just completion of the project. In most of the cases incentives are provided as per the early completion of the work. Two ceases can be considered while defining the reward system, one is continuous development and another is problem solving approach. Improvement in skill through training, skill development program like PMKVY, higher education and improvement in quality should be considered in continues development. And reduction of time and money due to problem solving approach should be considered. Reward can be in the monetary form or promotion. Monetary benefit should be calculated by considering the quality improvement and mitigation of the risk because of the problem-solving approach. Some fraction of total monetary benefit should be shared between the concerned team. This will encourage the team and pump the project spirit into team. This reward system will enhance the healthy competition among the team and help in their personal growth.

Structural changes

Some structural changes also need to be done in the existing management structure along with functional changes. The proposed functional improvements will put extra burden on the structure. Management structure is already occupied in various roles. Result also indicates that there is big scope of improvement in the organisation behavior. Both the things demand the structural changes. Structural gap needs to fulfil in the existing structure. As per the demand the supporting function needs to be introduced in the structure. This function can be taken from line and staff structure. In that structure, staff is the post which is supportive to the higher authority. But as per the research finding more money and the weightage is wasted on the upper management while actual work is carried by the execution level team. This should be balanced. This can be done by borrowing the staff function from line and staff structure and introduced it into the ground level team for their supportive role. The new post is proposed in management structure to improve performance. Functions of new post will be-

1. Monitor the authority rights which is given under responsibility-authority balance.
2. Documentation of the problem-solving approach.
3. Maintain the data of reward system.
4. Form cross functional team to improve coordination among the different parties.
5. Motivate the team and promote project spirit.
6. Help the team member for their personal growth & skill development
7. To make coordination, monitoring and control mechanism more effective.
8. Act as supervisory link.
9. Create awareness about company's goal, aim and objectives in execution team.
10. To have clearer picture and transparency so as to Reduce the distrust and disputes.
11. Create awareness about role, responsibility and significance of their work.

CONCLUSION

According to expert, proposed structure is expected to perform better than existing structure in communication and coordination, team motivation and spirit, accountability, roles and responsibility. This indicates that some of the limitations of the existing structure will be rectified.

- Hand in hand approach will improve

coordination and communication as a result of which, overall planning, execution and risk identification and sharing will be improved.

- Proposed structure will impart accountability into team, improve commitment through authority-responsibility balance and transparency can be achieved.

FUTURE SCOPE

Scoring model is the analysis tool used in this research work, but this is preliminary tool for analysis. Other method like simulation model can be used to get precise result. This is theoretical proposal and it is not implemented so further research can be taken to analyze the proposed structure through case study and actual performance of proposed structure and existing structure should be compared.

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Corresponding Author

Mr. Bharangar Pravindra Kumar*

PG Student, Dept of Civil Engg, PVPIT, Pune