

Assessing Project Time Management of the Contractors with Using ANP

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Abstract. Project management is the application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed sponsors' needs and expectations. Project time management is one of the fields that includes the processes which required success in order to complete projects on time so these processes are being affected by other factors [10]. Finally this study tries to introduce some of assessment models in project management and Morvarid petrochemical Co. as the executive of 5th olefin project in Asalouyeh and their contractors. Effective factors in time management and delays could be occurred by Morvarid petrochemical contractors according to the similarity of contract type are fined. (Fixed Price Construction & Erection Contract (Lump Sum)), these factors are categorized base on management fields in PMBOK standard and assessed with ANP. Contractors could be ranks while their strengths and weaknesses could be compared.

Keywords: Time management, PMBOK, ANP, Morvarid petrochemical company

1. Introduction

Assessment has a long history through time. Human has always had assessment in mind since they experienced division of labor as they started living in societies. Utilizing assessment systems came to known in 19th century, officially. To evaluate, qualitative values should be transformed into quantitative values so that comparison could be done. Using patterns which could evaluate the current situation in organizations and determining the weak points and improvable regions, while presenting a true base for strategic planning, seems to be of importance nowadays.

PMBOK is a standard in project management which provides a context for organizations to get acquainted with organizational project management and measure their development based on the criteria available in the standard. Project management has 9 main management fields.

Among these nine fields, project time management which is selected, for the time stream could not be stopped, speeded up or down and in fact it is of a high value. Time importance is pretty obvious in large projects such as petrochemicals, oil and gas industries. Time waste in projects such as Petrochemicals Company's construction could decrease the profit in an average of \$1.5 million in addition to the increase in construction and commissioning costs.

2. Research Questions

The following study tries to provide answers to the succeeding questions on Morvarid petrochemical Company petrochemical industry contractors' time management:

- What are the main factors effecting contractors time management?
- How the time management factors are prioritized in Morvarid Company petrochemical industry contractors, based on PMBOK?
- Which of the Morvarid petrochemical contractors have been more successful in time management?

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- What are the strengths and weakness in Morvarid petrochemical contractors in time management in comparing with each other?

3. Review of Literature

There are lots of project management models available around the world and some of them are presented here. But it should be mentioned that none of these models are developed just for independent assessment of time management.

The Organizational Project Management Maturity Model or OPM3, The Project Management Processes Improvement Model, Project Health Assessment Model, PM DELTA, PRINCE2[®] Maturity Model, Project Health Assessment Tool, Project Management Maturity Model (Kerzner Maturity Model), Portfolio, Program and Project Management Maturity Model (P3M3), Capability Maturity Model Integration (CMMI), Comprehensive Project Management Maturity Model (CPM3) [7].

4. An Introduction on the Studied Company and the Assessed Contractors

The complex was introduced as the top project in Bushehr province from Ministry of Industries and Mines, in 2008 and also it was gained Iran Project Management Institute prize, in 2009. It gained the IMPA award as the second top project in the world, in 2010. It gained the first place in Comprehensive Project Management Maturity Model (CPM3) among Iran's petrochemical projects. This led to an assessment of time management on the 4 main contractors which work with this petrochemical company. These 4 contractors are selected since they share the same nature in their contracts in some way. The contractors are Darya Sahel, Chekad-Samin consortium, Zagros Nasb e Sepahan and Farjud.

5. Effective Factors on Time Management Determination

The main effective factors on the time management were recognized through library study and expert judgment. The factors which included 86 parameters were distinguished through a questionnaire to determine the factors that contractors are responsible for and could stop the waste of time. The recognized 24 factors were divided into 8 clusters based on PMBOK which will provide answer to the first research question.

G. Goal

G1. Assessing Contractors Time Management

1. Integration Management

- 1.1. Capability in Leadership and Decision-Making
- 1.2. A Clear Definition of Goals, Owner Requests and Prioritizing them
- 1.3. Planning and Scheduling in Execution Steps of Work

2. Scope Management

- 2.1. Stability in Project Scope of Work
- 2.2. Appropriate Codification WBS & OBS[9]
- 2.3. The First Time Experienced Tasks
- 2.4. Following Up To Solve the Technical Query and Technical Documents

3. Cost Management

- 3.1. Having Enough Budget During the Project Execution
- 3.2. On-Time Personnel Payments

4. Quality Management

- 4.1. Having Enough Expert Technical Supervisors
- 4.2. Executing Several Projects Simultaneously
- 4.3. Having Appropriate Utilities and Machines Same as Volume & Type of Work
- 4.4. Meeting the Safety Issues

5. Human Resource Management

- 5.1. Having a Firm Project Control Team
- 5.2. Having Enough Human Resources
- 5.3. Having Educated and Skillful Human Resources
- 5.4. No Changes in Management Sequentially

6. Communications Management

6.1. Making a Sufficient and Effective Relation Between the involved Factors in Project[8]

6.2. Engineers Effective and Preventive Approaches

6.3. Using Up-To-Date Science in Project Control

7. Risk Management

7.1. Recognizing the Predictable Risks

7.2. Risk-Taking

8. Procurement Management

8.1. Supplying Material and Parts On-Time

8.2. Mobilization On-Time

A. Alternative (Contractors)

A.1. Darya Sahel Company

A.2. Chakad-Samin Consortium Company

A.3. Zagros Nasb-E-Sepahan Company

A.4. Farjud Company

6. Depicting the Decision Making Network

To draw this network, connections matrix which had rows and columns filled with all effective factors were determined. Factors which affect the other factors were shown by a check mark through questioning the expert judgment. The relation was defined in Super Design software. The result is the ANP model.

The obtained questionnaire from Super Designs software would do a paired comparison on clusters to find the goal factor. All 8 clusters in project management are compared with each other. The second part does a paired comparison between each nodes.

7. Calculations

It should be mentioned that since filling out the questionnaires out needed a great caution, researcher could solve all ambiguities and encouraged the other sides to fill out the questionnaires. From each 8 questionnaire, 7 were returned which seem to be logical in using this technique. The inconsistency coefficient was assessed after entering the questionnaire results geometric means to 3 decimal points (Combining answers) [5]. The maximum inconsistency coefficient of answers that calculates with software has been 0.07.

8. Prioritizing the Effective Factors on Morvarid Petrochemical Company Contractors on Time Management

The ANP model is used in prioritizing the effective factors on time management. This method is one of the best methods available in multiple criteria decision making. Unlike the AHP method, this method considers the relations and internal effects between factors. To answer the second research question, the clusters weighted supermatrix was used. Diagram 1 was drawn by Excel software. Results show that the most effective clusters on time management are cost and procurement managements, respectively.

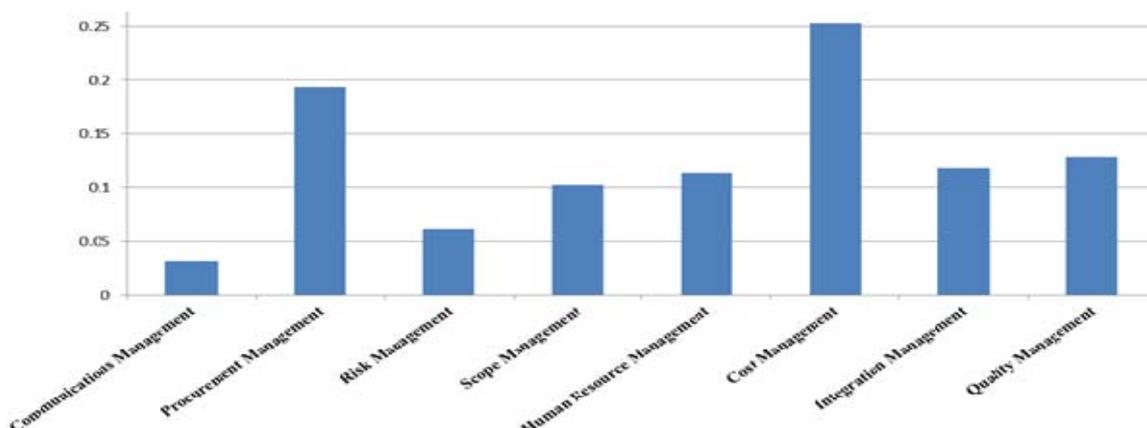


Diagram 1: Ranking on Effective Factors on Morvarid Petrochemical Company Contractors on Time Management

9. Morvarid Petrochemical Company Contractors' Ranking based on Time Management

To rank the contractors, the limited matrix was used, considering the goal. Diagram 2 was drawn using the Excel software. Based on this diagram, Zagros Nasb-E-Sepahan Company gains the first place. Darya Sahel Company, Farjud Company and Chakad-Samin Company get the second, third and fourth place respectively. The third research question is answered here.

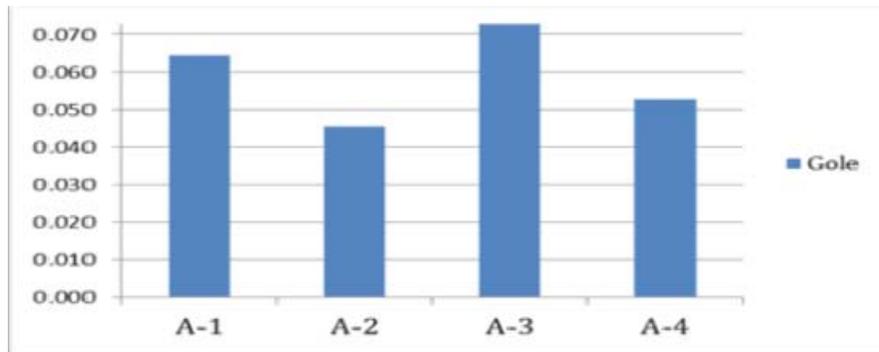


Diagram 2: Ranking of Morvarid Petrochemical Contractors Base on Time Management

10. Morvarid Petrochemical Company Contractors' Strengths and Weaknesses on Time Management Compared to Each Other

The weighted supermatrix is used in determining the contractors' strengths and weaknesses points on time management compared to each other. Diagram 3 was drawn by Excel software. In this diagram, color blue, represents the Darya Sahel Company, color red represents Chakad-Samin Company, color green represents the Zagros Nasb-E-Sepahan and color purple represents the Farjud Company. The fourth research question has been answered.

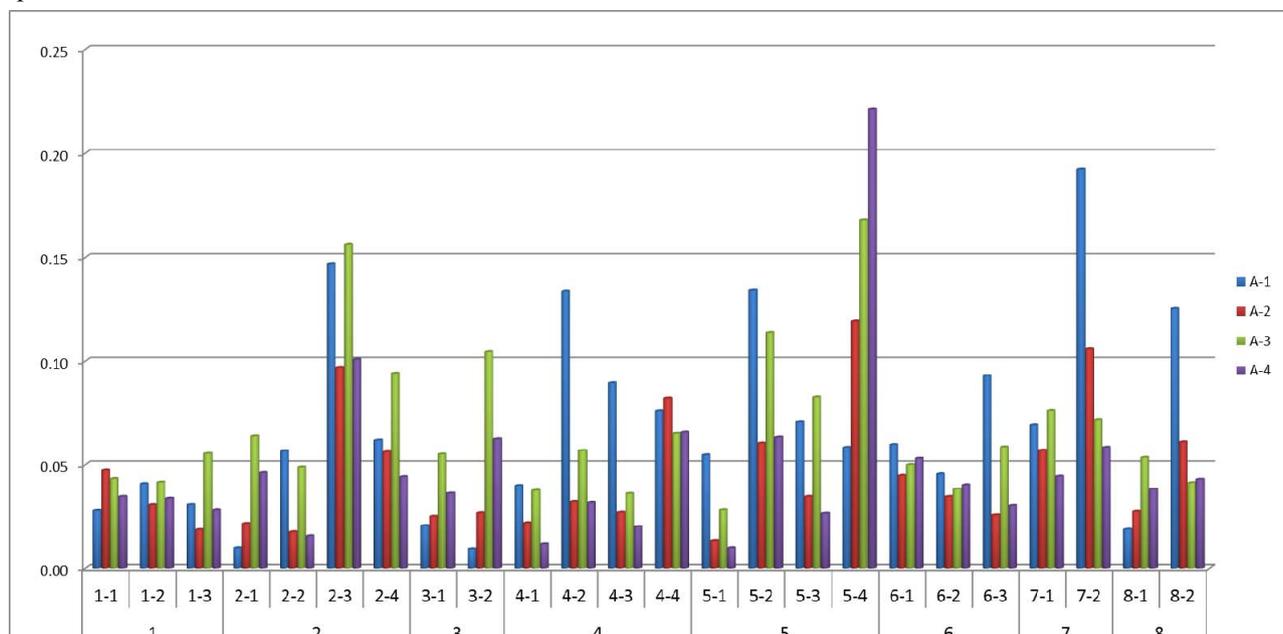


Diagram 3: Compared weakness and strength of contractor

11. Conclusion

Considering time management as an important part of industry, especially Iran's petrochemicals as an advanced industry. Managers could not gain any success if they don't consider the effective factors on time management. Investment in petrochemicals in Iran is advancing since this industry provides raw material for other industries. Cost management is the most important factor affecting time management. Project managers are advised to cost and budget control in projects since they provide a great deal of savings in both cost and time. Time and cost are collaterally related to each other. The other part is the procurement management. The duration expands and project delays don't have enough to rank contractors in project time management and

must be affect all factors. Their factors are the different weight value in delays. Finally all fields of project management related together and their relations don't as a same.

12. References

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