Assessing Time Project Management of Morvarid Petrochemical Contractor with Using ANP Technique

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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. 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 and questionnaire. Contractors could be ranks while their strengths and weaknesses could be compared. Their factors are the different weight value in delays. Finding of this research shows entire management project fields have relation with each other but the intensity of their relations are different and depend on time and place of project execution.

Index Terms—Time management, PMBOK, ANP, Morvarid petrochemical company

I. 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. Considering the developments in projective activities all around the world and also huge investments which are done in these fields, various models in improving the organization in project management have been introduced by organizations and researchers all over the world which the main goal of them in common is improving the project-centered organization performance in interaction with today's competitive world. As it could be seen, various institutions have presented improvement models which could be evaluated based on their backgrounds. One of the institutions is the Project Management Institute (PMI) which could be considered as the most significant

international institutions in project management studies. This institute began to provide a series of standards in project management which would improve the needed capacities to execute the organization strategies and also be of help for both large and small companies, in 1998. Research teams from lots of countries gathered together and started their job by studying the current models in organizational improvement so that they could design models with particular specifications.

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 which are as follows:

1. Project Integration Management
2. Project Scope Management
3. Project Time Management
4. Project Cost Management
5. Project Quality Management
6. Project Human Resource Management
7. Project Communications Management
8. Project Risk Management
9. Project Procurement Management

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.

II. RESEARCH QUESTIONS

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

1) What are the main factors effecting contractors time management?
2) How the time management factors are prioritized in Morvarid Company petrochemical industry contractors, based on PMBOK?
3) Which of the Morvarid petrochemical contractors have been more successful in time management?
4) What are the strengths and weakness in Morvarid petrochemical contractors in time management in

comparing with each other?

III. 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.

A. The Organizational Project Management Maturity Model or OPM3.

This model is based on PMBOK standard. The model was designed by PMI 20years subsequent to the ESA report in 1998. The model was designed to help the organizations to develop their strategies into successful results in a compatible and predictable manner.

B. The Project Management Processes Improvement Model

The project management processes improvement model was designed by Robert K. Wysocki and published by Artech House publications. He is a well-known author in project management and the author of the book: Effective Project Management: Traditional, Adaptive and Extreme. The model was published in the book "Project Management Process Improvement", in 2004.

C. Project Health Assessment Model

The project health assessment model is a recognizing technique of the huge plans and projects health in any of their existence. The model was designed based on the results for the Project Management Research Program in University of Sydney under Professor Ja'fari'ssupervision. The model was tested on 111 Australian project-centered companies by the partnership of VW Coaching GmbH and Bremen University in Germany.

D. PM DELTA

Deutsche Gesellschaft für Projektmanagements.V. (Project Management Association in German), as an association consisting of management experts, conducted some researches on project management standards, in early 1990s. The output was the PM DELTA and in this comprehensive research, the PM DELTA product family was provided.

The main goal of the PM DELTA products is to compare and assess the project management systems in a project.

Iran's National Petrochemical Company utilized the PM DELTA assessment product to evaluate its strength and weaknesses points in 2006.The company assessed 5 of its projects with using European adviser and it was determined the strengths and improvement fields in these projects, respectively.

E. PRINCE2® Maturity Model

The main goal of PRINCE2® Maturity Model which was presented in 2004 is to enable the organizations to do measurements and assessments their maturity in using of the project management method in controlled environments.

F. Project Health Assessment Tool

Human Systems Organization was first established in the U.K. by Cooke-Davies Ph. D. in 1985. The organization has cooperated by multinational companies in using proven tools and processes for benchmarking and competency assessment. As a result, it has required a suitable capability in assessing of the projects and companies situations.

G. Project Management Maturity Model (Kerzner Maturity Model)

Project management maturity model is a guide to access the maturity for the organizations. Professor Kerzner, the model developer, believes that the maturity in an organization takes place when the organization is able to plan strategically for project management.

The first version of this model was conducted by Learning International Institute in 2001, Inc., under supervision of Kerzner Ph. D. and through research and implementation in Nortel. The second version was done with the same crew about three years efforts and research in Microsoft in 2005 and was published in a book with the same name by John Wiley & Sons, Inc.

H. Portfolio, Program and Project Management Maturity Model (P3M3)

The model was substituted for PM3 by Office of Government Commerce in February 1, 2006. The model was provided based on Carnegie Mellon University Software Engineering Institute (SEI) Capability Maturity Model Integration (CMMI) and has an approach like capability maturity model in this university.

I. Capability Maturity Model Integration (CMMI)

CMMI is one of the most significant maturity models which could be used to make an assessment on contractors from the employers' point of view by all organizations and projects.

Since this model has a great significance, the model is referred to as the mother and base of other maturity models. The U.S. Department of Defense faced lots of problems with the projects have been done by contractors out of the Department. The Department decided to provide an assessment model for its own subset contractor companies [7]. Now in this paper assessing contractors performance in project time management with utilizes project management fields in PMBOK standard and identifying effective factors in time management that the contractors with manage them will try to reduce project time.

IV. 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.

• Khatamolanbiya Company has three affiliated companies with the names of: Omran Sahel, Rah Sahel and Darya Sahel. In Morvarid Petrochemical Company, the Darya Sahel Company was the contractor for the process units and first sea water intake construction & erection. The contract date for the 5th olefin plan construction and installation was on October 19, 2006 and the plan was supposed to finish in 13months. The assignment date changed to February 8, 2009 due to the pre-commissioning omissions. This brought a 460days of delay.

• Chakad-E-JonubCompany formed a consortium for executing the utility project and petrochemical tanks for Morvarid Company. The new consortium name was Chakad-Samin Company which worked in Morvarid project. The contract was signed on June 30, 2008 and the contract duration was determined 4months which seem to be illogical and without professional working and expert considerations. The temporary delivery date for the project was on January 27, 2010 with a delay of 15months.

• Farjud Company began its activity in late 2002 with the aim of activity in facilities, equipment and also development in industry and mining. The company has finished 5projects so far and took charge of installation and commissioning of the equipment related to the second sea water intake in Morvarid Petrochemical Company, in 2009. The contract was signed on October 19, 2009. The contract duration was determined 4months but the temporary delivery date for the project was on August 23, 2010 with a 180day delay.

• Zagros Nasb-E-Sepahan Company has successfully finished 11projects in specific industrial regions. The company took charge of constructing second sea water intake for Morvarid Petrochemical Company. It also had the charge for construction and installation of pressurized spherical tanks and the two cylindrical storage tanks. The contract was signed on April 6, 2008 which was related to the mechanical installation and tanks pre-commissioning region. The contract duration was determined 6months but the temporary delivery date for the project was on November 21, 2009 with a 380day delay.

The contract for the second sea water intake was signed on October 13, 2008. The contract duration was determined 6 months but the temporary delivery date for the project was on October 07, 2009 with a 178 day delay.

In this article we want to show the delays not base for assessing time management and other elements that affected to it.

V. 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

VI. 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 seven expert judgment and then for obtained table unit synthesis idea and cells compare to peer if equal or greater than four check mark exist is accepted. Table 1 implied this subject.

The relation was defined in Super Design software. The result is the ANP model.

TABLE 1- RELATION MATRIX BETWEEN INNER AND OUTER EFFECTIVE TIME MANAGEMENT FACTORS

Code		1.1	1.2	1.3	2.1	2.2	2.3	2.4	3.1	3.2	4.1	4.2	4.3	4.4	5.1	5.2	5.3	5.4	6.1	6.2	6.3	7.1	7.2	8.1	8.2	A.1	A.2	A.3	A.4
1	1.1	▨		√					√			√							√	√						√	√	√	√
	1.2	√	▨	√	√	√						√						√	√	√		√				√	√	√	√
	1.3	√		▨				√				√			√					√					√	√	√	√	√
2	2.1		√	√	▨	√			√		√	√												√		√	√	√	√
	2.2	√	√			▨		√	√	√	√									√		√				√	√	√	√
	2.3						▨																			√	√	√	√
	2.4				√		√	▨												√		√				√	√	√	√
3	3.1	√		√			√		▨	√	√	√	√	√	√		√			√		√				√	√	√	√
	3.2							√		▨	√		√	√	√		√									√	√	√	√
4	4.1		√	√	√		√	√			▨	√	√						√			√				√	√	√	√
	4.2					√						▨								√					√	√	√	√	√
	4.3	√		√	√							√	▨												√	√	√	√	√
	4.4	√										√		▨												√	√	√	√
5	5.1		√	√		√		√		√		√			▨	√			√	√		√		√		√	√	√	√
	5.2				√			√				√				▨										√	√	√	√
	5.3																▨	√	√		√	√				√	√	√	√
	5.4											√						▨								√	√	√	√
6	6.1					√	√							√		√			▨		√					√	√	√	√
	6.2															√				▨	√		√			√	√	√	√
	6.3					√	√					√					√			√	▨					√	√	√	√
7	7.1	√			√		√					√										▨				√	√	√	√
	7.2		√																				▨			√	√	√	√
8	8.1																							▨		√	√	√	√
	8.2																								▨	√	√	√	√
A	A.1																									▨			
	A.2																										▨		
	A.3																											▨	
	A.4																												▨

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 nods. Table 2 and the inconsistency coefficient are presentenced below.

How do you assess the right side factor importance comparing to the left side factor on time management in Morvarid Petrochemical Company contractors?

TABLE 2- PAIRED COMPARISON BETWEEN NODS AND INCONSISTENCY COEFFICIENT

Inconsistency 0.0443	4.1	4.2	4.3	4.4
4.1	1	4	0.65189	1.568
4.2	0.25	1	0.513	0.70102
4.3	1.534	1.94932	1	1.568
4.4	0.63776	1.4265	0.63776	1

VII. 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 and the lowest was 0.001 which could be a good inconsistency coefficient in answers.

The weighted supermatrix and the limited were calculated by Super Designs software. In all these matrices each column's for each cluster summed number is equal to 1. To transform the supermatrix to weighted supermatrix each block's weight should be calculated. To calculate the blocks' weight should be done the paired comparison between the clusters. The weighted supermatrix is obtained by multiplying these weights by each of the supermatrix blocks. If this matrix is powered, the limited supermatrix is obtained. Table 3 shows cluster matrix in below.

TABLE 3- CLUSTERS MATRIX

Cluster Code	1	2	3	4	5	6	7	8	A	G
1	0.107	0.142	0.098	0.156	0.110	0.000	0.330	0.140	0.000	0.118
2	0.107	0.119	0.128	0.111	0.098	0.110	0.189	0.092	0.000	0.103
3	0.140	0.211	0.121	0.000	0.212	0.000	0.000	0.232	0.000	0.252
4	0.093	0.108	0.087	0.118	0.081	0.140	0.235	0.134	0.000	0.129
5	0.160	0.000	0.143	0.196	0.106	0.264	0.000	0.126	0.000	0.113
6	0.090	0.075	0.117	0.092	0.139	0.000	0.000	0.000	0.000	0.031
7	0.063	0.085	0.000	0.067	0.063	0.093	0.000	0.000	0.000	0.061
8	0.134	0.141	0.186	0.148	0.085	0.235	0.000	0.138	0.000	0.193
A	0.107	0.119	0.121	0.111	0.106	0.159	0.247	0.138	0.000	0.000
G	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

VIII. 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.
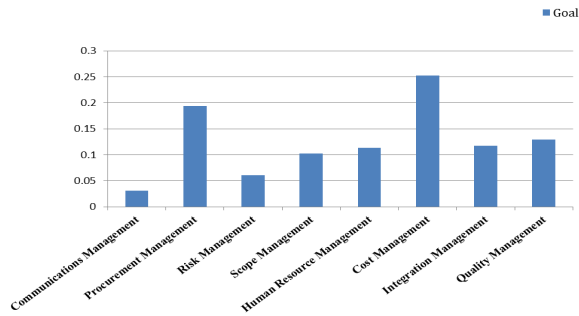

Diagram 1: Ranking on Effective Factors on Morvarid Petrochemical Company Contractors on Time Management

IX. 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.

X. 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 (Table 4).

Z 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.
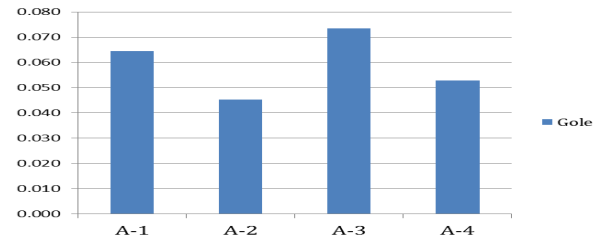

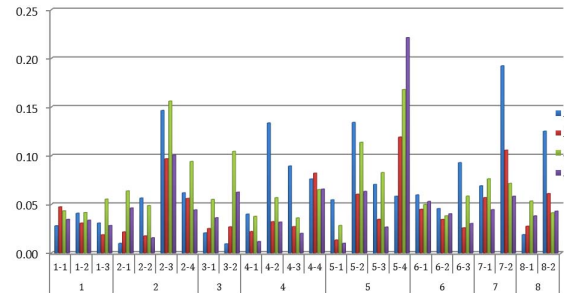Diagram 2: Ranking of Morvarid Petrochemical Contractors Base on Time Management

Diagram 3: Compared weakness and strength of contractor

TABLE 4- WEIGHTED SUPPER MATRIX

Code		1			2				3		4				5				6			7		8		A				G
		1-1	1-2	1-3	2-1	2-2	2-3	2-4	3-1	3-2	4-1	4-2	4-3	4-4	5-1	5-2	5-3	5-4	6-1	6-2	6-3	7-1	7-2	8-1	8-2	A-1	A-2	A-3	A-4	Gl
1	1-1	0.000	0.073	0.133	0.000	0.060	0.000	0.000	0.055	0.000	0.066	0.000	0.121	0.404	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.330	0.000	0.070	0.000	0.000	0.000	0.000	0.000	0.069
	1-2	0.000	0.000	0.000	0.110	0.105	0.000	0.000	0.000	0.000	0.090	0.000	0.000	0.000	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018
	1-3	0.153	0.073	0.000	0.059	0.000	0.000	0.000	0.055	0.000	0.000	0.000	0.121	0.000	0.089	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.572	0.070	0.275	0.000	0.000	0.000	0.000	0.031
2	2-1	0.000	0.074	0.000	0.000	0.000	0.000	0.178	0.000	0.000	0.028	0.000	0.172	0.000	0.000	0.172	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027
	2-2	0.000	0.074	0.000	0.142	0.000	0.500	0.000	0.000	0.000	0.028	0.000	0.000	0.000	0.071	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035
	2-3	0.000	0.000	0.000	0.000	0.000	0.000	0.078	0.145	0.000	0.028	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042	0.000	0.059	0.063	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
	2-4	0.000	0.000	0.000	0.000	0.138	0.000	0.000	0.000	0.214	0.028	0.253	0.000	0.000	0.027	0.172	0.000	0.000	0.102	0.110	0.086	0.063	0.000	0.092	0.000	0.000	0.000	0.000	0.000	0.024
3	3-1	0.201	0.000	0.000	0.251	0.123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.146
	3-2	0.000	0.000	0.174	0.000	0.123	0.000	0.000	0.137	0.000	0.000	0.000	0.000	0.000	0.212	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.232	0.455	0.000	0.000	0.000	0.000	0.107
4	4-1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.090	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.043
	4-2	0.134	0.128	0.116	0.022	0.126	0.000	0.000	0.025	0.000	0.051	0.000	0.183	0.307	0.081	0.284	0.000	0.433	0.000	0.140	0.000	0.235	0.000	0.134	0.000	0.000	0.000	0.000	0.000	0.016
	4-3	0.000	0.000	0.000	0.107	0.000	0.000	0.000	0.025	0.000	0.068	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.044
	4-4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.164	0.000	0.183	0.000	0.183	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025
5	5-1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.091	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025
	5-2	0.000	0.000	0.199	0.000	0.000	0.000	0.000	0.041	0.000	0.000	0.000	0.000	0.000	0.106	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.000	0.000	0.000	0.018
	5-3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.063	0.000	0.000	0.000	0.000	0.000	0.036
	5-4	0.230	0.220	0.000	0.000	0.000	0.000	0.000	0.041	0.070	0.196	0.000	0.000	0.000	0.000	0.000	0.214	0.000	0.345	0.264	0.345	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.035
6	6-1	0.068	0.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.000	0.000	0.000	0.000	0.000	0.281	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007
	6-2	0.062	0.062	0.000	0.000	0.088	0.000	0.000	0.000	0.197	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009
	6-3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.139	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
7	7-1	0.000	0.087	0.079	0.000	0.099	0.000	0.184	0.000	0.000	0.067	0.153	0.000	0.000	0.063	0.000	0.093	0.000	0.121	0.093	0.121	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046
	7-2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015
8	8-1	0.000	0.000	0.000	0.168	0.000	0.000	0.304	0.105	0.000	0.148	0.000	0.000	0.000	0.085	0.000	0.000	0.000	0.000	0.235	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.160
	8-2	0.000	0.000	0.166	0.000	0.000	0.000	0.000	0.105	0.000	0.000	0.000	0.339	0.230	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.138	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033
A	A-1	0.028	0.041	0.031	0.010	0.056	0.146	0.062	0.021	0.009	0.040	0.134	0.089	0.076	0.055	0.134	0.070	0.058	0.060	0.046	0.093	0.069	0.192	0.019	0.125	0.000	0.000	0.000	0.000	0.000
	A-2	0.047	0.031	0.019	0.022	0.018	0.097	0.056	0.025	0.027	0.022	0.032	0.027	0.082	0.013	0.060	0.035	0.119	0.045	0.035	0.026	0.057	0.106	0.028	0.061	0.000	0.000	0.000	0.000	0.000
	A-3	0.043	0.042	0.055	0.064	0.049	0.156	0.094	0.055	0.104	0.038	0.057	0.036	0.065	0.028	0.114	0.083	0.168	0.050	0.038	0.058	0.076	0.071	0.053	0.041	0.000	0.000	0.000	0.000	0.000
	A-4	0.035	0.034	0.028	0.046	0.016	0.101	0.044	0.036	0.062	0.012	0.032	0.020	0.066	0.010	0.063	0.027	0.221	0.053	0.040	0.030	0.044	0.058	0.038	0.043	0.000	0.000	0.000	0.000	0.000
G	Gl	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

XI. 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 expends 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.

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