

Determining and ranking essential criteria of Construction Project Selection in Telecommunication of North Khorasan-Iran

Majid Mojahed, Rosnah bt Mohd Yusuff, Mohammad Reyhani

Abstract—Economy project often becomes one of the strong selecting points to attract contractors. However, economy projects sometimes mislead contractors to select. Therefore, it is crucial for contractors to mark projects comparison before deciding to select a smart one. A contractor usually compares some criteria of project but they not enough. The criteria being considered always vary from one contractor to another. Some may only consider the revenue and location, whilst some may focus on its financial of owner, knowledge of supervisor and also revenue of project. Smart contractors might wisely try to include all criteria when evaluating which project is the best one. In this paper two main purposes have been followed. The first purpose is to identify relevant criteria, based on perspective of contractors in North Khorasan Telecommunication. For this reason we will collect some criteria from contractors of construction projects by using Delphi method. To identify achieved criteria, based on view of contractors in North Khorasan Telecommunication-Iran, all contractors of construction came together and discussed about criteria in several sessions. The second purpose of this research is to compute the weighting coefficients and ranking criteria regarding the contractors' point of view by Comparison Matrix.

Index Terms—Project Selection, Decision making, Comparison Matrix, Delphi Method.

I. INTRODUCTION

A project is a temporary endeavor undertaken to create a unique product, service or result. Temporary means that every project has a definite end. The end is reached when the project's objectives has been achieved, or it becomes clear that the project objectives will not or cannot be met, or the need for the project no longer exists and the project is terminated. Temporary does not necessarily mean short in duration, many projects last for several years. In every case, however, the duration of a project is finite. Projects are not ongoing efforts. Selection of project among a set of possible alternatives is a difficult task that decision maker (DM) has to face[1].

Project selection and project evaluation involve decisions

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that are critical to the profitability, growth and survival of project management organizations in the increasingly competitive global scenario. Such decisions are often complex, because they require identification, consideration and analysis of many tangible and intangible factors [2].

Ten general factors as follow:

Project mission, Top management, Project schedule/plan, Client consultation, Personnel, Technical tasks, Client acceptance, Monitoring and feedback, Communication, Trouble-shooting [3]. In another research some criteria were put into two categories, as follow:

Intrinsic Criteria:

Project identification ability, Resources requirements and availability, the past experience of the organization in managing the project Management attitudes, the time horizon of the project.

Extrinsic Criteria:

The risk /return ratio, the market environment, Government policies and regulation, the socioeconomic climate, Legal and technological [4].

In addition to these, it was also found some criteria about Research and development, Information system as followed:

R&D project selection criteria:

Successful completion of the project, Work related to existing products only, New products/ process, Manufacturing plants association in selecting the research programs, Patenting Publishing the work done, Social objectives, Image of the organization, Duration of project Cost of project, Space availability, Availability of executive manpower, Availability of technical support staff [5].

IS project selection criteria:

Financial related criteria, Organizational needs related criteria, Competing environmental related criteria, Technical related criteria, Risk related criteria, Management support related criteria [6].

II. OBJECTIVE OF THE STUDY

The main objective of this study is specifying the criteria of construction projects in order to rank and also select the best one in North Khorasan Telecommunication – Iran. Results of the study will be used by constructors in order to allow them to select the best project and also may be used by the authorities, managers and decision makers to identify contractors' viewpoints in all construction projects which is one of the main project problems.

III. SCOPE AND LIMITATION OF THE STUDY

The study area of this research is in Telecommunication of North Khorasan province in Iran. Institutional surveys and interviews will conduct to collect data on project construction selection during four weeks. In this paper only the construction projects is covered due to the time limit and other constraints. This study discusses about the existing construction contractors in North Khorasan Telecommunication. The focus is on selected contractors due to they are only well-known contractors in North Khorasan Telecommunication on construction projects and the most projects are delivered and performed by them.

IV. SIGNIFICANCE OF RESEARCH

Lack of a scientific method in selection of construction project is a fundamental part that has been always considered as one of the critical problems for contractors. Improving the performance of this method not only increases contractors' benefit but also reduces risk and completion time of projects. In recent years, the projects which are selected by contractors are or so complex and full value that they are not able to finish them perfectly or so simple and low value that they evade doing it and they will search to do a few other projects simultaneously. In either event, the contractors and the owners of projects will be a loss.

However, after describing the current situation of project construction selection in North Khorasan Telecommunication, all of criteria have been recognized and a survey has been conducted by using some interviews. The interviews were done among the contractors of North Khorasan Telecommunication. Knowing these factors can be a proper basis for contractors, managers and decision makers in order to achieve goals in construction projects and also other projects with nearly the same characteristics.

V. METHODOLOGY AND DATA COLLECTION

In this paper two main purposes have been followed. The first purpose is to identify relevant criteria, based on perspective of contractors in North Khorasan Telecommunication. For this reason we will collect some criteria from contractors of construction projects by using Delphi method. To identify achieved criteria, based on view of contractors in North Khorasan Telecommunication, 26 contractors come together and discussed about them in several sessions

A. Delphi technique

Delphi is a technique by which a group attempts to generate ideas or find a solution for a specific problem by amassing ideas. In other words, it is a method for the systematic collection and aggregation of informed judgments from a group of experts on specific questions or issues. The first advantage Of Delphi method is to derive a consensus among a panel of experts who make predictions about future developments. The second is to Provide independent and anonymous input regarding future events and finally the third is to Use repeated rounds of

questioning, written responses and avoids the biasing effects possible in oral methods, such as brainstorming method.

The steps of doing Delphi method can be listed as follows:

- Step 1: Selection of expert panel.
- Step 2: Formation of questions.
- Step 3: Statement generation.
- Step 4: Reduction and categorization.
- Step 5: Rating.
- Step 6: Analysis and iteration.

The second purpose of this research is to compute the weighting coefficients and ranking criteria regarding the contractors' point of view by Comparison Matrix.

B. Comparison Matrix

Pairwise Comparison Matrix is a good way of weighing up the relative importance of different courses of action. It is useful where priorities are not clear, where there are conflicting demands on resources or are competing in importance. It is a tool that provides a framework for comparing each course of action against all others, and helps to show the difference in importance between factors. In other words, it is used to compare each option with each other option, one-by-one. For each comparison, we will decide which of the two options is most important, and then assign a score to show how much more important it is.

Finally, the following criteria have been collected for construction project selection by using Delphi method as followed:

Value of project (C1):

The value of each project as amount that is determined by the organizations (the owners of projects). Basically, the value of the project shows project's scale. This is a positive criterion that it will increase the contractor's profit.

Environmental condition (C2):

This criterion contains a set of geography and climate parameters in projects location that should be implemented. This criterion has a positive relationship with the contractor's profits.

Cover of insurance (C3):

In addition to solve most of unpredictable problems in projects, this criterion not only reduces the risk but also ensures profit of contractor. The criterion often was done in order to promote project's safety.

Material availability (C4):

Amount of raw materials that contractors can provide from the place that project implements. Certainly, it is also positive criterion because profit will increase after increasing material availability.

Comfort of route (C5):

This criterion is positive and it shows traffic's comfort where the project is implemented.

Problem of regulations (C6):

Instructions must be clear and comprehensive so if the problem is occurred, it must be foreseen in contract.

Delay and penalty (C7):

This criterion is about the crimes that may be imposed to the contractors. Negative relationship of this criterion with profit contractor is obvious.

Exact design (C8):

It shows the degree of design and indicates more satisfaction of contractor. They will get high degree of satisfaction if this criterion increases.

Exact accomplished method (C9):

It shows degree of accuracy of implementation method. If that method is similar to contractor's viewpoints so it is assumed that profit will increase.

Cost estimating data (C10):

These items can directly affect beyond the projects. If number of these items increase, the profit of project will decrease so this criterion will be negative.

Yearly cost calculation (C11):

After the cost estimating data were specified, this criterion can calculate all the project's costs. By this criterion can all contractors find costs before the project to start. It is clear that this criterion decrease contractor's profit so it is considered as a negative criterion.

Being familiar with the area or being domestic (C12):

This criterion recognizes how much a contractor knows about the place where the project will do there. Certainly, familiar place can reduce risks and increase profit of project.

Availability of capital (C13):

Above criterion is considered as a contractor financial parameter. Increasing of this criterion indicates more freedom in selecting projects by contractor.

Work experience (C14):

Contractors' experience in similar activities can help in many projects for increasing profit. It is considered as a positive criterion.

Having management and control project knowledge (C15):

Having this knowledge can be better run successful projects, so as a positive measure will be considered.

Having relationship with owner (C16):

Contractors' relationship with the owner is one of important criterion that can affect indirectly. This communication is effective on criteria such as crime and risk and promising future and etc.

A promising future (C17):

This criterion is along with risk and will be affected not only on the profit's contractor but also it will increase contractor's harm apparently.

Experience of owner (C18):

Doing several similar projects by many owners can help to improve project implementation. Also, this experience can be useful in selecting supervisor.

Financial of owner (C19):

Payment to contractors is directly related to this criterion. If the owner pays to contractors timely, project will most likely finish in time and also contractors will earn more benefit.

Prompt payment to contractor (C20):

Payment timely to contractor is directly related to this criterion. After the part of activities were performed by contractor, with conforming of regulations the owner should pay to contractor timely, and finally project will finish in time and also the contractor will earn more benefit.

Management attitude (C21):

The owner's behavior and deal with contractor can be motivated to select the projects. Logical behavior causes

contractor to contribute about projects more.

Work experience of supervisor (C22):

Supervisory experiences in similar projects can remove problems for the contractor and provide better recommendations for implementing of project.

The owner policies and regulations (C23):

The owner's policies may cause to prevent some harms of project. This is one of a positive criterion that can increase benefit of contractor.

Potential risks for contractor (C24):

This criterion will include all the risks that might occur for contractor.

Political impact in area (C25):

Some projects or some areas have political pressures that it will cause regional unrest during implementation of project.

Unrealistic imposed order by owner (C26):

The owner's unrealistic imposed order cause to occur harms to project. This is one of a negative criterion that can decrease benefit of contractor.

Benefit (C27):

The subtraction between of contractor's amount of receipt and all costs that contractor paid during the project.

VI. DATA ANALYSIS

Comparison matrix is a part of the model structure of the analytical hierarchy process, a widely used Multi criteria decision-making methodology. The main difficulty is to reconcile the inevitable inconsistency of the pairwise comparison matrix elicited from the decision makers in real-world applications [7].

Data collection of this study was gathered from 26 construction's contractors in Telecommunication Company so to identify these criteria using Delphi was done and finally number of 27 criteria was identified. After that by using Comparison Matrix the weight of each criterion was specified and criteria were ranked from upper to lower.

The steps of preparing comparison matrix can be generally listed as follows:

- 1) Define the problem and determine the research objective.
- 2) Construct a pair-wise comparison matrix ($n \times n$) for criteria with respect to objective by using Saaty's 1-9 scale of pairwise comparisons shown in table I.

TABLE I: SAATY'S 1-9 SCALE OF PAIRWISE COMPARISONS

| INTENSITY OF IMPORTANCE | DEFINITION |
|-------------------------|---------------------|
| 1 | EQUAL IMPORTANCE |
| 2 | WEAK OR SLIGHT |
| 3 | MODERATE IMPORTANCE |
| 4 | MODERATE PLUS |
| 5 | STRONG IMPORTANCE |
| 6 | STRONG PLUS |
| 7 | VERY STRONG |
| 8 | VERY, VERY STRONG |
| 9 | EXTREME IMPORTANCE |

The pair-wise comparisons are done in terms of which

element dominates the other.

$$\frac{n \times (n-1)}{2}$$

- 3) There are $\frac{n \times (n-1)}{2}$ judgments required to develop the set of matrix in step 2. Reciprocals are automatically assigned in each pair-wise comparison.
- 4) Synthesizing the pairwise comparison matrix is performed by dividing each element of the matrix by its column total.
- 5) The priority vector can be obtained by finding the row averages.
- 6) Weighted sum matrix is found by multiplying the pairwise comparison matrix and priority vector.
- 7) Dividing all the elements of the weighted sum matrix by their respective priority vector element.

8) Compute the average of this value to obtain λ_{max} .

9) Find the Consistency Index, CI, as follows:

$$CI = (\lambda_{max} - n) / (n - 1)$$

Where n is the matrix size.

10) Calculate the consistency ratio, CR, as follows:

$$CR = CI / RI$$

Judgment consistency can be checked by taking the consistency ratio (CR) of CI with the appropriate value in Table II. The CR is acceptable, if it does not exceed 0.10.

If it is more, the judgment matrix is inconsistent. To obtain a consistent matrix, judgments should be reviewed and improved.

TABLE II: AVERAGE RANDOM CONSISTENCY (RI)

| Size of matrix | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------|------|------|------|------|------|------|------|------|------|------|
| Random consistency | 0.00 | 0.00 | 0.58 | 0.90 | 1.12 | 1.24 | 1.32 | 1.41 | 1.45 | 1.49 |

Fortunately, there is no need to implement the steps manually. Professional commercial software, Super Decisions and Expert Choice software are available on the market which simplifies the implementation of these steps and automates many of its computations. The *main table* is the table was included with 27 rows and columns as well. These data has been gathered from 26 construction's contractors in Telecommunication Company so to identify these comparisons using questioners were done and their weights were specified and ranked from upper to lower at the end.

Finally, the following tables from III to VI have been identified by construction projects' contractors as followed:

TABLE III: 1ST PART OF MAIN TABLE

| CRITERIA | C1 | C2 | C3 | C4 | C5 | C6 | C7 |
|----------|------|------|------|------|------|------|------|
| C1 | 1.00 | 7.00 | 8.00 | 8.00 | 7.00 | 9.00 | 8.00 |
| C2 | 0.14 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 1.00 |
| C3 | 0.13 | 1.00 | 1.00 | 1.00 | 0.50 | 2.00 | 1.00 |
| C4 | 0.13 | 1.00 | 1.00 | 1.00 | 0.33 | 6.00 | 1.00 |
| C5 | 0.14 | 1.00 | 2.00 | 3.00 | 1.00 | 2.00 | 2.00 |
| C6 | 0.11 | 0.50 | 0.50 | 0.17 | 0.50 | 1.00 | 0.50 |
| C7 | 0.13 | 1.00 | 1.00 | 1.00 | 0.50 | 2.00 | 1.00 |
| C8 | 0.13 | 1.00 | 1.00 | 1.00 | 0.50 | 2.00 | 1.00 |
| C9 | 0.11 | 0.50 | 0.50 | 1.00 | 0.50 | 2.00 | 0.50 |
| C10 | 0.14 | 1.00 | 2.00 | 0.20 | 1.00 | 4.00 | 2.00 |
| C11 | 0.14 | 1.00 | 2.00 | 0.25 | 1.00 | 3.00 | 2.00 |
| C12 | 0.17 | 3.00 | 3.00 | 0.50 | 2.00 | 3.00 | 3.00 |
| C13 | 0.14 | 1.00 | 2.00 | 1.00 | 1.00 | 4.00 | 2.00 |
| C14 | 0.20 | 2.00 | 3.00 | 0.33 | 3.00 | 3.00 | 3.00 |
| C15 | 0.17 | 2.00 | 3.00 | 0.50 | 3.00 | 2.00 | 2.00 |
| C16 | 0.33 | 3.00 | 3.00 | 5.00 | 4.00 | 3.00 | 5.00 |
| C17 | 0.13 | 0.50 | 1.00 | 1.00 | 0.50 | 1.00 | 1.00 |
| C18 | 0.14 | 1.00 | 2.00 | 0.25 | 1.00 | 2.00 | 1.00 |
| C19 | 0.25 | 2.00 | 2.00 | 3.00 | 4.00 | 2.00 | 2.00 |

| | | | | | | | |
|-----|------|------|------|------|------|------|------|
| C20 | 0.17 | 2.00 | 3.00 | 5.00 | 1.00 | 2.00 | 3.00 |
| C21 | 0.14 | 1.00 | 2.00 | 0.50 | 1.00 | 1.00 | 1.00 |
| C22 | 0.20 | 4.00 | 3.00 | 2.00 | 1.00 | 3.00 | 3.00 |
| C23 | 0.13 | 0.50 | 1.00 | 1.00 | 0.50 | 1.00 | 1.00 |
| C24 | 0.17 | 3.00 | 2.00 | 3.00 | 3.00 | 3.00 | 2.00 |
| C25 | 0.20 | 2.00 | 4.00 | 2.00 | 4.00 | 3.00 | 3.00 |
| C26 | 0.20 | 2.00 | 3.00 | 3.00 | 3.00 | 4.00 | 4.00 |
| C27 | 5.00 | 7.00 | 9.00 | 8.00 | 8.00 | 9.00 | 8.00 |

TABLE IV: 2ND PART OF MAIN TABLE

| Criteria | C8 | C9 | C10 | C11 | C12 | C13 | C14 |
|----------|------|------|------|------|------|------|------|
| C1 | 8.00 | 9.00 | 7.00 | 7.00 | 6.00 | 7.00 | 5.00 |
| C2 | 1.00 | 2.00 | 1.00 | 1.00 | 0.33 | 1.00 | 0.50 |
| C3 | 1.00 | 2.00 | 0.50 | 0.50 | 0.33 | 0.50 | 0.33 |
| C4 | 1.00 | 1.00 | 5.00 | 4.00 | 2.00 | 1.00 | 3.00 |
| C5 | 2.00 | 2.00 | 1.00 | 1.00 | 0.50 | 1.00 | 0.33 |
| C6 | 0.50 | 0.50 | 0.25 | 0.33 | 0.33 | 0.25 | 0.33 |
| C7 | 1.00 | 2.00 | 0.50 | 0.50 | 0.33 | 0.50 | 0.33 |
| C8 | 1.00 | 1.00 | 3.00 | 2.00 | 0.20 | 0.25 | 0.33 |
| C9 | 1.00 | 1.00 | 0.20 | 1.00 | 0.20 | 0.33 | 0.33 |
| C10 | 0.33 | 5.00 | 1.00 | 1.00 | 0.50 | 1.00 | 1.00 |
| C11 | 0.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.25 |
| C12 | 5.00 | 5.00 | 2.00 | 1.00 | 1.00 | 2.00 | 1.00 |
| C13 | 4.00 | 3.00 | 1.00 | 1.00 | 0.50 | 1.00 | 1.00 |
| C14 | 3.00 | 3.00 | 1.00 | 4.00 | 1.00 | 1.00 | 1.00 |
| C15 | 0.50 | 2.00 | 1.00 | 1.00 | 1.00 | 0.50 | 1.00 |
| C16 | 6.00 | 5.00 | 1.00 | 2.00 | 2.00 | 4.00 | 5.00 |
| C17 | 1.00 | 1.00 | 0.33 | 0.50 | 0.33 | 0.25 | 1.00 |
| C18 | 0.50 | 2.00 | 1.00 | 1.00 | 0.50 | 1.00 | 0.33 |
| C19 | 3.00 | 4.00 | 1.00 | 2.00 | 2.00 | 3.00 | 1.00 |
| C20 | 5.00 | 6.00 | 3.00 | 1.00 | 1.00 | 5.00 | 3.00 |

| | | | | | | | |
|-----|------|------|------|------|------|------|------|
| C21 | 0.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.33 |
| C22 | 2.00 | 4.00 | 1.00 | 3.00 | 2.00 | 1.00 | 1.00 |
| C23 | 1.00 | 1.00 | 0.25 | 0.50 | 0.20 | 0.33 | 0.50 |
| C24 | 2.00 | 3.00 | 0.50 | 0.50 | 1.00 | 0.50 | 1.00 |
| C25 | 1.00 | 3.00 | 1.00 | 3.00 | 0.50 | 1.00 | 1.00 |
| C26 | 1.00 | 1.00 | 1.00 | 3.00 | 1.00 | 0.50 | 1.00 |
| C27 | 9.00 | 9.00 | 8.00 | 8.00 | 7.00 | 8.00 | 8.00 |

TABLE V: 3TH PART OF MAIN TABLE

| CRITERIA | C15 | C16 | C17 | C18 | C19 | C20 | C21 |
|----------|------|------|------|------|------|------|------|
| C1 | 6.00 | 3.00 | 8.00 | 7.00 | 4.00 | 6.00 | 7.00 |
| C2 | 0.50 | 0.33 | 2.00 | 1.00 | 0.50 | 0.50 | 1.00 |
| C3 | 0.33 | 0.33 | 1.00 | 0.50 | 0.50 | 0.33 | 0.50 |
| C4 | 2.00 | 0.20 | 1.00 | 4.00 | 0.33 | 0.20 | 2.00 |
| C5 | 0.33 | 0.25 | 2.00 | 1.00 | 0.25 | 1.00 | 1.00 |
| C6 | 0.50 | 0.33 | 1.00 | 0.50 | 0.50 | 0.50 | 1.00 |
| C7 | 0.50 | 0.20 | 1.00 | 1.00 | 0.50 | 0.33 | 1.00 |
| C8 | 2.00 | 0.17 | 1.00 | 2.00 | 0.33 | 0.20 | 2.00 |
| C9 | 0.50 | 0.20 | 1.00 | 0.50 | 0.25 | 0.17 | 1.00 |
| C10 | 1.00 | 1.00 | 3.00 | 1.00 | 1.00 | 0.33 | 1.00 |
| C11 | 1.00 | 0.50 | 2.00 | 1.00 | 0.50 | 1.00 | 1.00 |
| C12 | 1.00 | 0.50 | 3.00 | 2.00 | 0.50 | 1.00 | 1.00 |
| C13 | 2.00 | 0.25 | 4.00 | 1.00 | 0.33 | 0.20 | 1.00 |
| C14 | 1.00 | 0.20 | 1.00 | 3.00 | 1.00 | 0.33 | 3.00 |
| C15 | 1.00 | 0.25 | 1.00 | 1.00 | 0.25 | 1.00 | 1.00 |
| C16 | 4.00 | 1.00 | 5.00 | 6.00 | 1.00 | 2.00 | 5.00 |
| C17 | 1.00 | 0.20 | 1.00 | 4.00 | 0.33 | 0.25 | 1.00 |
| C18 | 1.00 | 0.17 | 0.25 | 1.00 | 0.20 | 0.14 | 1.00 |
| C19 | 4.00 | 1.00 | 3.00 | 5.00 | 1.00 | 0.33 | 4.00 |
| C20 | 1.00 | 0.50 | 4.00 | 7.00 | 3.00 | 1.00 | 5.00 |
| C21 | 1.00 | 0.20 | 1.00 | 1.00 | 0.25 | 0.20 | 1.00 |
| C22 | 3.00 | 0.50 | 2.00 | 2.00 | 0.50 | 0.20 | 3.00 |
| C23 | 0.50 | 0.17 | 1.00 | 3.00 | 0.25 | 0.17 | 1.00 |
| C24 | 1.00 | 0.50 | 1.00 | 3.00 | 0.33 | 1.00 | 3.00 |
| C25 | 0.50 | 0.25 | 1.00 | 1.00 | 1.00 | 0.25 | 2.00 |
| C26 | 2.00 | 0.33 | 2.00 | 4.00 | 0.50 | 0.33 | 3.00 |
| C27 | 9.00 | 6.00 | 7.00 | 8.00 | 7.00 | 6.00 | 9.00 |

TABLE VI: 4TH PART OF MAIN TABLE

| Criteria | C22 | C23 | C24 | C25 | C26 | C27 |
|----------|------|------|------|------|------|------|
| C1 | 5.00 | 8.00 | 6.00 | 5.00 | 5.00 | 0.20 |
| C2 | 0.25 | 2.00 | 0.33 | 0.50 | 0.50 | 0.14 |
| C3 | 0.33 | 1.00 | 0.50 | 0.25 | 0.33 | 0.11 |
| C4 | 0.50 | 1.00 | 0.33 | 0.50 | 0.33 | 0.13 |
| C5 | 1.00 | 2.00 | 0.33 | 0.25 | 0.33 | 0.13 |
| C6 | 0.33 | 1.00 | 0.33 | 0.33 | 0.25 | 0.11 |
| C7 | 0.33 | 1.00 | 0.50 | 0.33 | 0.25 | 0.13 |
| C8 | 0.50 | 1.00 | 0.50 | 1.00 | 1.00 | 0.11 |
| C9 | 0.25 | 1.00 | 0.33 | 0.33 | 1.00 | 0.11 |
| C10 | 1.00 | 4.00 | 2.00 | 1.00 | 1.00 | 0.13 |
| C11 | 0.33 | 2.00 | 2.00 | 0.33 | 0.33 | 0.13 |
| C12 | 0.50 | 5.00 | 1.00 | 2.00 | 1.00 | 0.14 |
| C13 | 1.00 | 3.00 | 2.00 | 1.00 | 2.00 | 0.13 |
| C14 | 1.00 | 2.00 | 1.00 | 1.00 | 1.00 | 0.13 |
| C15 | 0.33 | 2.00 | 1.00 | 2.00 | 0.50 | 0.11 |
| C16 | 2.00 | 6.00 | 2.00 | 4.00 | 3.00 | 0.17 |
| C17 | 0.50 | 1.00 | 1.00 | 1.00 | 0.50 | 0.14 |
| C18 | 0.50 | 0.33 | 0.33 | 1.00 | 0.25 | 0.13 |
| C19 | 2.00 | 4.00 | 3.00 | 1.00 | 2.00 | 0.14 |
| C20 | 5.00 | 6.00 | 1.00 | 4.00 | 3.00 | 0.17 |
| C21 | 0.33 | 1.00 | 0.33 | 0.50 | 0.33 | 0.11 |
| C22 | 1.00 | 3.00 | 2.00 | 1.00 | 1.00 | 0.13 |
| C23 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 | 0.11 |
| C24 | 0.50 | 1.00 | 1.00 | 1.00 | 1.00 | 0.14 |
| C25 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.11 |
| C26 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.13 |
| C27 | 8.00 | 9.00 | 7.00 | 9.00 | 8.00 | 1.00 |

TABLE VII: WEIGHTED CRITERIA

| Criteria | Weight |
|----------|-------------|
| C1 | 0.133656043 |
| C2 | 0.018071932 |
| C3 | 0.01382358 |
| C4 | 0.029758918 |
| C5 | 0.021560712 |
| C6 | 0.010782752 |
| C7 | 0.014350259 |
| C8 | 0.019863449 |
| C9 | 0.01225489 |
| C10 | 0.028267967 |
| C11 | 0.021553571 |
| C12 | 0.036264449 |
| C13 | 0.029310692 |
| C14 | 0.032085658 |
| C15 | 0.023884907 |
| C16 | 0.067857152 |
| C17 | 0.016591663 |
| C18 | 0.015299748 |
| C19 | 0.04698662 |
| C20 | 0.061671646 |
| C21 | 0.015472957 |
| C22 | 0.036356683 |
| C23 | 0.014812045 |
| C24 | 0.029171919 |
| C25 | 0.029338778 |
| C26 | 0.032635388 |
| C27 | 0.188315621 |

TABLE VIII: SORTED WEIGHTS

| Criteria | Weight |
|----------|-------------|
| C27 | 0.188315621 |
| C1 | 0.133656043 |
| C16 | 0.067857152 |
| C20 | 0.061671646 |
| C19 | 0.04698662 |
| C22 | 0.036356683 |
| C12 | 0.036264449 |
| C26 | 0.032635388 |
| C14 | 0.032085658 |
| C4 | 0.029758918 |
| C25 | 0.029338778 |
| C13 | 0.029310692 |
| C24 | 0.029171919 |
| C10 | 0.028267967 |
| C15 | 0.023884907 |
| C5 | 0.021560712 |
| C11 | 0.021553571 |
| C8 | 0.019863449 |
| C2 | 0.018071932 |
| C17 | 0.016591663 |
| C21 | 0.015472957 |
| C18 | 0.015299748 |
| C23 | 0.014812045 |
| C7 | 0.014350259 |
| C3 | 0.01382358 |
| C9 | 0.01225489 |
| C6 | 0.010782752 |

relations are specified then the table VII and VIII will be close to the truth presumably.

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VII. CONCLUSION AND RECOMMENDATION

To specify the best project, contractors usually compare some criteria of project but they not enough. The criteria being considered always vary from one contractor to another. In this paper it is also used different criteria such as qualitative and quantitative that some of them are negative and some positive. The gathering data was compared in main table was included with 27 rows and also 27 columns in tables of III till VI. These data has been gathered from 26 construction's contractors in Telecommunication Company of North Khorasan – Iran in order to identify degree of their importance and finally their weights were specified in table of VII.

In other words, table VII shows the weights of criteria and table VIII shows them from the top to bottom after using Supper Decision Software. This table shows that the most and the least criterion is Benefit and Problem of regulations respectively. Meanwhile, the consistency (CR) was 0.089 so it is acceptable.

Authors suggest detecting the relation between these criteria which have been informed in this paper. If these