



Investigating the human recourses' effect in time managements of high-rise buildings projects in urban area (A case study)

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ABSTRACT

The presented article tried to estimate the human recourses' effects on time managements of high-rise buildings projects in urban area which is implemented on Tehran city construction projects. For this purpose, statistical analysis with the random population and the sample population of about 200 people has been used. The research variables which are integration management, project management's scope, human resource management, project communication, project risk management, time management, quality management, procurement management are first tested for their normality which has been done using SPSS software. The results of the research are classified after statistical evaluation and the conditions of their statistical distribution are extracted.

1. Introduction

The urban construction industry in Iran is one of the sectors of the construction industry that has grown significantly in recent decades, which has shown its growth in the years after the revolution. This trend shows that our country's specialists and engineers have achieved significant progress in this industry and employers, consulting engineers and contractors have been able to gain good experiences in this field (Nasirzadeh, 2008).

Although each construction project is said to have unique characteristics in terms of local location, design and execution, many of the factors affecting construction productivity are the same in all projects, although they may have an impact on every project is different. Therefore, the point that should not be overlooked is the use of past experiences in future projects (Yarahmadi, 2013).

Every organization needs micro and macro strategies and planning for its progress and development. The position and role of human resources in these strategies as the main resources of the organization is of great importance and credibility. In other words, human resources are the real wealth of an organization. There is a direct relationship between human capital and productivity in organizations. Therefore, effective management of these valuable resources is necessary to achieve the goals of the organization (Modaghalchi and Naghizadeh, 2015).

Since today human resources are the most valuable factor of production and the most important capital of any organization and the main source of competitive advantage and the creation of basic capabilities of any organization, one of the most important organizational planning is human resource planning. An important factor for the existence of human resource planning is planning to achieve the skills, training and ultimately improve the

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competencies of human resources. The most effective way to achieve competitive advantage in the current situation is to make the employees of organizations more efficient by improving them, and what is important for the development of human resources is that the improvement of human resources cannot be achieved only through technical and specialized training. Development of payment staff and this important component will not be possible by applying strategic management in the field of human resource management (Modaghalchi and Naghizadeh, 2015).

In the importance of human resources, it is enough that they have said: "Today, the main capital of development projects is human resources." Be analyzed and examined. Since it is important and necessary to study the performance and find the factors affecting productivity in projects, so it is better that this task is assigned to civil managers who are the same as project managers (Gholipour and Shahbazi, 2011).

Since today human resources are the most valuable factor of production and the most important capital of any organization and the main source of competitive advantage and the creation of basic capabilities of any organization, one of the most important organizational planning is human resource planning. An important factor for the existence of human resource planning is planning to achieve skills, training and ultimately improve human resources. The most effective way to achieve competitive advantage in the current situation is to make the employees of organizations more efficient by improving them, and what is important for the development of human resources is that the improvement of human resources cannot be achieved only through technical and specialized training. Development of paid staff and this important component will not be possible with the application of strategic management in the field of human resource management (Salonius and Lönnqvist, 2012).

Given that human resources are a strategic resource for organizations, it is an important and integral part of strategic planning issues and most organizational planning and human resources are strategic in nature. One of the main factors that have led to a new approach in strategic human resource planning is the process of technological, social and economic changes in the internal and external environment of organizations that are always faced. If organizations want to keep pace with these changes, they must have a comprehensive and strategic approach and consider a variety of requirements. In today's world, the most important source of competition for organizations is efficient human resources or knowledge workers. At the same time, many organizations lack the necessary expertise and skills to be able to effectively develop strategic human resource plans. It is important to note that the formation of human resource strategies requires the participation and cooperation of human resource managers with senior management of the organization. Alignment and linking of strategies and participation and cooperation of managers in different fields of human resources with the senior

management of the organization, leads to the development of human resources (Yarahmadi, 2013).

Human resource systems are designed and based on the role and duties of jobs in organizations. In other words, all human resources task systems are formed on the basis of jobs. In the new topics in the field of human resources, the role and position of the organization's competencies and capabilities as a linking factor of human resources subsystems is rapidly expanding. "Human resource management based on capabilities" is a way that many organizations have turned to it in order to increase the efficiency and effectiveness of processes in human resource management. Human resource management based on capabilities is a passage from the traditional method of human resource management based on "what individuals have" (e.g. qualifications) to "what individuals have to do". Human resource management based on capabilities will be all related processes such as hiring and selecting employees, education and development, succession management, performance management and job rewards based on capabilities. Based on human resources management based on capabilities, employees should push their level of capability toward optimal capability (Gholipour and Shahbazi, 2011).

In addition, employees should work to achieve the level of capability needed for higher jobs. Comparison between the required level of capability and current capability level will determine the distance between these two levels. This will allow employees to focus on the required development and training programs and work to go to a higher level of competencies. For each job, characteristics and capabilities are needed. The level of adaptation of "required job competencies" with "employed competencies" will play an important role in the better performance of the individual and ultimately organizational productivity. In the maximum proportion of the person to the job, it is necessary to pay special attention to the inn and inner competencies (intelligence and behavioral characteristics) in the recruitment and selection phase of human resources while, the skills (skills and knowledge) are effective in designing and defining individual development and education programs. In this way, by proper management of competencies and considering their innate nature and their intubation, the gap between job and work competencies can be reduced (Yarahmadi, 2013). Therefore, competencies can be divided into different groups (Nasirzadeh, 2008):

Basic Competencies: includes a set of characteristics and behaviors that allow for doing something with minimum expectations and standards.

Distinguishing competencies: there are set of capabilities that make superior performances possible compared to normal and moderate functions.

Key competencies (pivotal): capabilities are barely and completed. These capabilities are gradually created at the individual and organization level over many years and cannot be easily imitated. The capabilities of individuals can be evaluated and named as a pivot and key when it is

related to the strategic orientations of the relevant organization and has a significant effect on the realization of these orientations.

2. Project Manager Competencies

One of the main problems in successful implementation of national projects and leads to the waste of many financial and human resources is the lack of qualified managers and the lack of utilization of project-based organizations from project management techniques. In order for the manager to perform properly, he must acquire the qualifications and skills required in that field (Nasirzadeh, 2008).

Competency is a set of knowledge, skills, traits and behavioral characteristics and personal characteristics. Competency can be categorized into two categories: one required competencies that determine the necessary skills for minimal performance in work or task, and the other is superior competencies based on which the results are higher than average. Competency is a set of knowledge, skills, personality traits, interests, experiences and job-related ability that enables their holders to take responsibility at a higher than average level. In fact, competence presents a model that represents the individual or the superior performance in the job (Armstrong, 1993). Management is the most important pillar in all organizations that are effective in achieving organizational goals. The effectiveness of managers also depends essentially on their skills, knowledge level, attitude, ability and finally their competencies (Nasirzadeh, 2008).

Experience has shown that most managers are eager to create competency frameworks or models in their organizations, but they do not know what parameters they need to create this model. The process is a set of related measures and activities that are carried out in order to achieve a pre-specific result or service. Each process is marked by its inputs, the tools and techniques that can be used, and the resulting outputs (Yazdi et al., 2018).

The PMCD standard has developed the competencies of project managers in the framework of PMI and PMBOK standards. This model includes all the knowledge, skills, attitudes and behaviors that the project manager is required to have for effective management of projects. Project manager's success has been explained in three types of competencies including knowledge competencies, functional competencies and behavioral competencies. Knowledge competencies include integrated management competency, range management competency, time management competency, quality management competency, logistics management competency, human resource management competency, communication management competency, risk management competence and cost management competency. Each of these competencies has its own dimensions and all of them are composed of five aspects of initial activities, planning, implementation, control and closing activities. Behavioral

competencies include success and action competency, managerial competence, assistance and human services competence, impact and influence competence, cognitive competence and individual effectiveness competency. Project Managers' Competency Framework outlines the components of specialized, behavioral and conceptual competencies in project management (Salonius and Lönnqvist, 2012).

Project management is qualified according to the ICB standard in the field of management and industries, which includes the work of determining the project's goals and needs, the ability to identify the risks and opportunities of the project, the ability to design the project organization, the ability to manage the quality of the project. This competency also includes defining and agreeing on the project in order to meet the needs and demands of the parties involved, especially responsible customers and users. ICB is a set of factors that are necessary for the competence of project managers. These factors were classified into three groups (Yarahmadi, 2013):

Technical competencies: This group consists of 20 factors that are made of processes described in pmbok standard.

Behavioral competencies: This group consists of 15 behavioral factors, behavioral, moral and personality characteristics necessary for project management.

Competencies related to the environmental conditions of the project: This group consists of 11 factors that are carried out to coordinate the project's actions with the platform that is located. Legal, financial, human resources, organizational, etc. are factors that none of them fully put into the project while shaping the project space.

Construction projects, sometimes also called projects or construction projects, include a broader concept. In the public sector, a specific set of operations and services implemented by one of the executive agencies of the country, over a certain period of time and with a specific validity to achieve the goals set out in accordance with the country's development plan and in the form of fixed investment, is the construction project. The life cycle of construction projects is determined in Fig. 1 (Nasirzadeh, 2008).

3. Time Management in Construction Projects

Throughout history, time and its various dimensions have been considered by various civilizations and today this attention is more than ever. New technologies have provided an environment in which countless information can be accessed in the short term and things can be done much faster and easier (Haslinda et al., 2018).

In a situation where we have more tools for time management and administrative processes are less exposed to paper and unnecessary requirements, time weakness management cannot be hidden and more efficiency is needed.

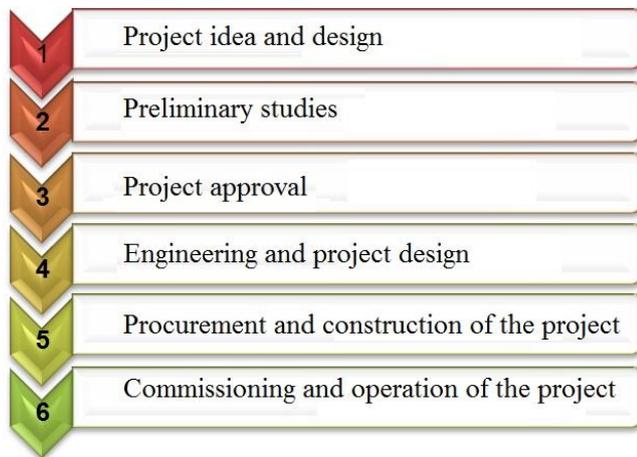


Figure 1. Life cycle of construction projects (Nasirzadeh, 2008)

Because to be more successful, both in our personal and professional lives, we need to apply time management strategies. These strategies are designed to make the best use of time and are used as methods for monitoring and controlling time. Using time effectively, goals can be identified and tasks and activities can be planned and prioritized. By planning and allocating time, people's perception of available time increases, and as a result, they can use their time in a purposeful and organized way. Prioritizing tasks and allocating specific time to each activity allows various tasks to be performed on time. Therefore, by using time management methods, people's insights on how to use more time, more accurate estimates of the time required to do things are obtained and overall useful results are obtained (Modaghalchi and Naghizadeh, 2015). Some of the results of different time management practices can be classified as prepare for informed planning, reminders in doing things, organizing thoughts and activities, doing things on time, creating the necessary motivation to do the job, focusing one's attention on priorities, avoid wasting time and unnecessary things, speed in improving and upgrading personal performance, reduce daily stress and thus increase mental health, and increase efficiency, organization and productivity. In general, with the implementation of time management, planning and monitoring, more realistic consequences are achieved and everything is done more efficiently (Yarahmadi, 2013).

The issue of time management has occupied the minds of people and experts of different tendencies for many years, especially managers and executives of executive projects. If every year, many specialized training courses and seminars are held in relation to time management in order to find a solution and guide the managers in the face of the more complex problems and the expansion of the field of projects every day. In the meantime; Construction projects, despite the stagnation of recent years, are one of the dynamic areas in the field of projects carried out in the country, which, despite much experience in this field, still suffer from failure in the field of operation. So that there was no proper planning in this area; practically, it causes

the final product to be inefficient, and in most cases, the needs and predictions made at the beginning of the work are shaken and heterogeneous by delaying its end. However, the moves that have been made in the field of project management in the country today; this indicates that in recent years, more attention has been paid to the issue of project management and especially the use of scheduling methods and its presentation in the implementation of time management. But due to ignorance of the method of application and unfamiliarity with the limitations and potentials of each of these methods, the correct use and the expected result of the program is not done (Gholipour and Shahbazi, 2011).

Construction projects generally face several limitations that have a significant impact on project timing and cost. Limited resources including materials, workshop machinery and equipment, liquidity and skilled and semi-skilled human resources are among the most important of these restrictions. Changes in the amount of access to these resources during the project and also the possibility or impossibility of surplus resources in each time period in the later stages of project implementation add to the complexity of the issue (Martinez et al., 2020).

Project time management includes the processes required to complete a project on time. In this field, the knowledge of the definition and sequence of activities, estimation of resources and duration of activities, preparation and control of scheduling program are examined. Project time management processes include the following (Gholipour and Shahbazi, 2011):

Definition of Activities: Definition of activities is the process of identifying specific actions that are taken to produce deliverables to a project. Project work packages are usually broken down into smaller components called activities, which represent the work required to complete the work package. Activities are the basis for estimating, scheduling, executing, and controlling project work. In this process, the activities that meet the project objectives are defined and planned.

Sequence of activities: The sequence of activities is the process of identifying and documenting the relationships between project activities. Activities are connected using logical relationships. Each activity and milestone, except for the initial and final activities, will require at least one prerequisite and one post - requirement. Delays or haste in logical relationships between activities may be needed to create a realistic and achievable schedule. Sequencing activities can be done using project management software or using manual or automatic techniques.

Estimating the activities' sources: Estimating the sources of activities are the type process and amount of raw materials, manpower, equipment or tools needed to perform each activity.

Estimating the duration of activities: Estimating the duration of activities is the approximation of the number of work courses required to complete the activities with estimated resources. Estimating the duration of activities uses information on the scope of activities, types of

resources required, the amount of estimated resources and the calendar of resources. Inputs for estimating the duration of activities come from an individual or group in the project team who is more familiar with the nature of the work in each activity. Estimation of duration evolves gradually. This process also considers the quality and availability of input data. For example, as project design and engineering work progresses, more details and more accurate data become available, and the accuracy of the estimated time is improved. Therefore, it can be assumed that the estimation of time will gradually become more accurate and qualitative.

Preparation of scheduling: This process is the process of analyzing the sequence of activities, duration of activities, resource requirements and time constraints to prepare the project schedule. Entering activities, durations, and resources into a scheduling tool generates a schedule with scheduled dates to complete project activities. Creating an acceptable project schedule is often an iterative process. This process also specifies the start and end dates of the planned program for project activities and milestones. Scheduling to create an approved schedule that could become the baseline for tracking project progress may require reviewing and revising the estimated time and resources. Review and maintain a realistic schedule as the project progresses, the project management schedule changes, and risks become apparent.

Scheduling control: Scheduling control is the process of monitoring the status of the project to manage project progress, updates and changes to the timeline.

4. Material and Methods

The research findings largely depend on the type of researcher exploring to achieve it. The purpose of choosing a research method is for the researcher to determine what method and method to adopt in order to help him / her as accurately, easily, quickly and cheaply as possible to obtain answers or answers to the research question or questions (Martinez et al., 2020). Research can be categorized according to different criteria and bases. These criteria and bases provide the conditions on which research can be classified. In general, it can be said that the most useful scheme for classifying types of research is the situation in which the categories are minimized and the differences are maximized (Salonius and Lönnqvist, 2012). The present study is based on the purpose of an applied research. The purpose of applied research to gaining understanding or knowledge is necessary to determine the means by which a identified need is met. In this type of research, the goal is to discover new knowledge that follows a specific application of the product with a process in reality. More precisely, applied research is an attempt to answer a scientific dilemma that exists in the real world. In classifying the types of research according to the method, the present research is descriptive-survey. Descriptive-survey research includes a set of methods that aim to

describe the conditions or phenomena under study. Conducting descriptive research can only be to better understand the current situation or to assist in the decision-making process. In this study, the community includes those who are involved in the implementation of construction projects in Tehran and are familiar with project management issues which of these, 200 experts were selected as a randomly clustered sample population. The implementation method was to complete a questionnaire compliance of projects with PMBOK standard. The results of the evaluation after collection are classified and analyzed by statistical approaches. Also, the Content Validity Ratio relationship was used to measure the validity of the measuring instrument, and the results calculated with an average of 0.9 (90%) indicate the validity of the method. Cronbach's alpha was used to measure the internal consistency and validity and reliability of the model which results indicate the 0.729 and high valid. SPSS software was used for statistical analysis.

5. Results and Discussions

Data analysis is of particular importance for checking the accuracy of hypotheses for any type of research. Today, in most researches that rely on the information collected from the subject under study, it is considered as one of the main and most important parts of the research by analyzing the information. Raw data is analyzed using statistical techniques and after processing is provided to users in the form of information. To analyze the collected data, first, descriptive statistics that examine the demographic variables of the research, including gender, level of education, etc.; will be examined. Then analytical statistics are presented. Also, in order to investigate the relations between the standard nine management and its dimensions and to investigate the causes of deviations in the implementation of construction projects in Tehran, t-test and regression test and structural equation model and histogram diagram have been used. In the first part of the evaluation, a statistical description of the expert personnel of interest in the sample community is provided. The characteristics considered in this section are: the status of respondents in terms of age, the status of respondents in terms of gender, the status of respondents in terms of education, the status of respondents in terms of work experience which is shows in Table 1. After classifying the statistical description of the sample population, the research variables which are integration management, project management's scope, human resource management, project communication, project risk management, time management, quality management, procurement management are first tested for their normality which has been done using SPSS software. After providing the descriptive statistics of the sample population, the statistical aspect of the project evaluation was conducted step-by-step as shown in Figs. 2 to 10.

Table 1. Descriptive statistics of the sample population

No.	Parameter	Frequency	Percentage
<i>Gender of employees</i>			
1	Male	123	69.49
2	Female	54	30.51
<i>Level of Education</i>			
3	Associate Degree	28	15.80
4	Bachelor	106	59.90
5	Master	43	24.30
<i>Employee work experience</i>			
6	1 - 4 year	21	11.80
7	5 - 8 year	67	37.80
8	9 - 12 year	49	27.70
9	13 - 16 year	22	12.50
	17 - 20 year	18	10.20

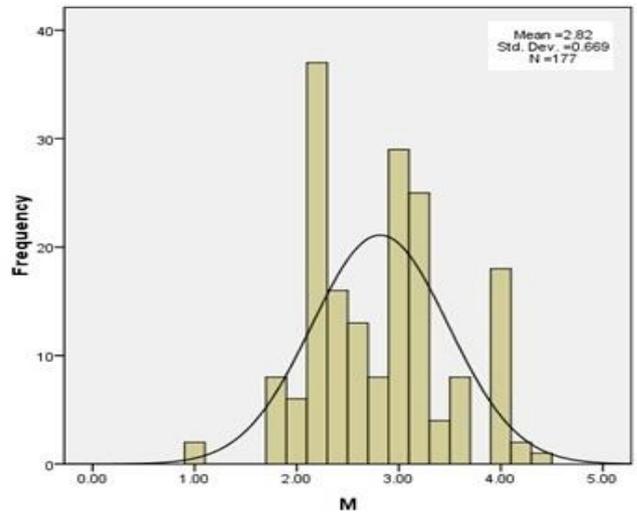


Figure 4. Histogram dimension of project management scope

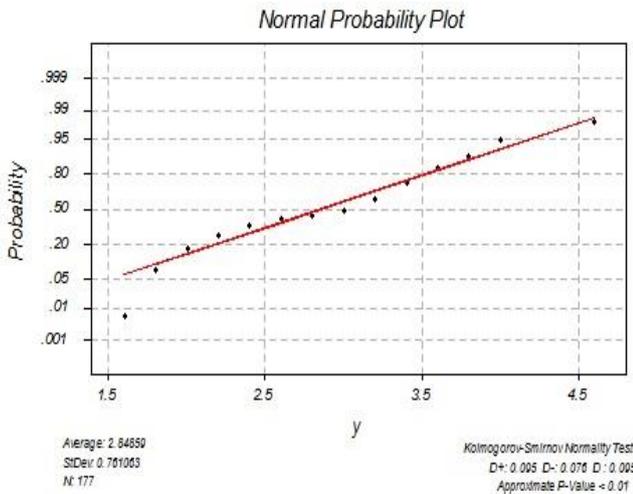


Figure 2. Kolmogorov-Smirnov test results on statistical data

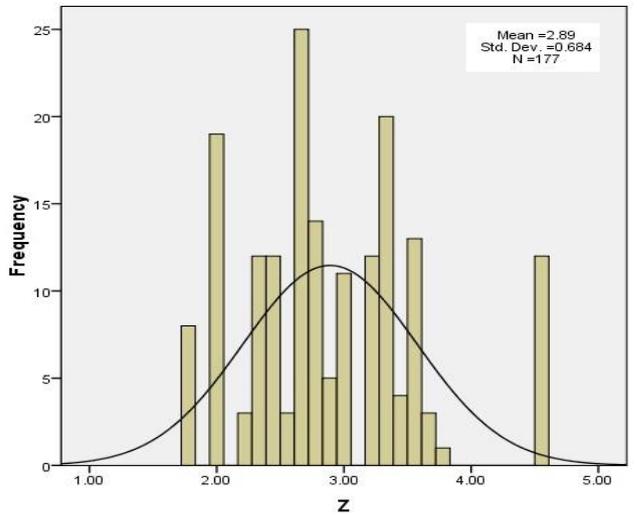


Figure 5. Histogram dimension of time management in project

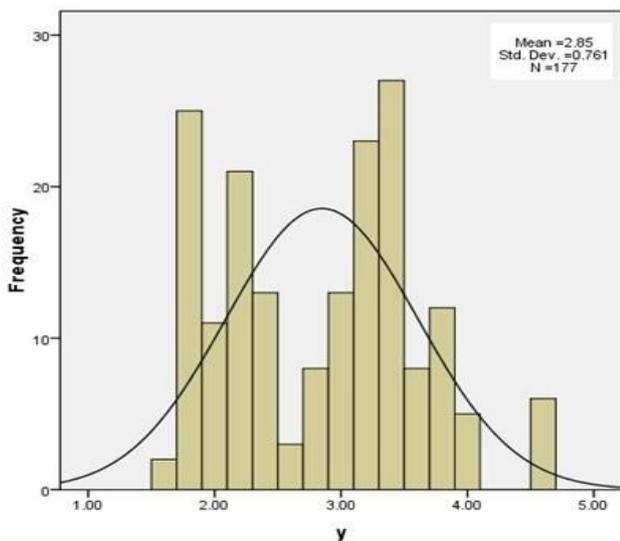


Figure 3. Histogram dimension of integration management in project

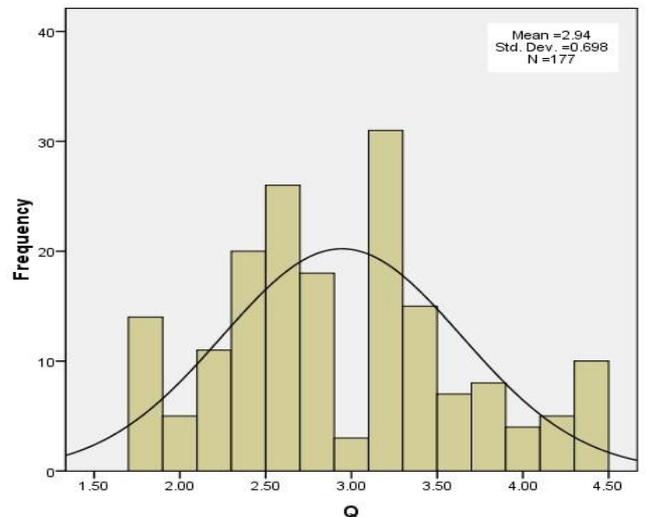


Figure 6. Histogram dimension of quality management in project

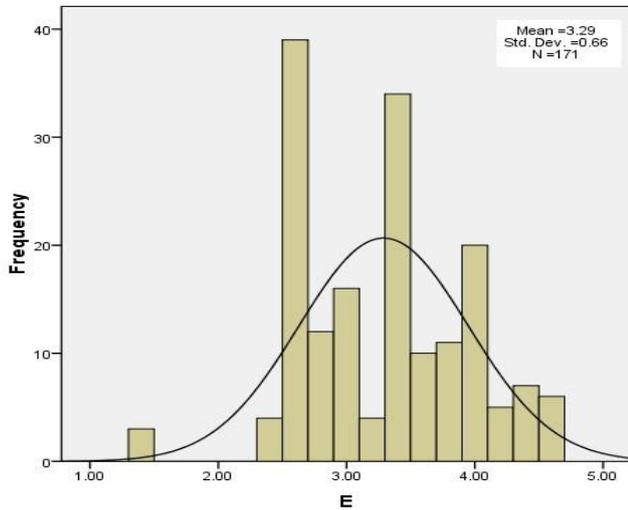


Figure 7. Histogram dimension of human resource management in project

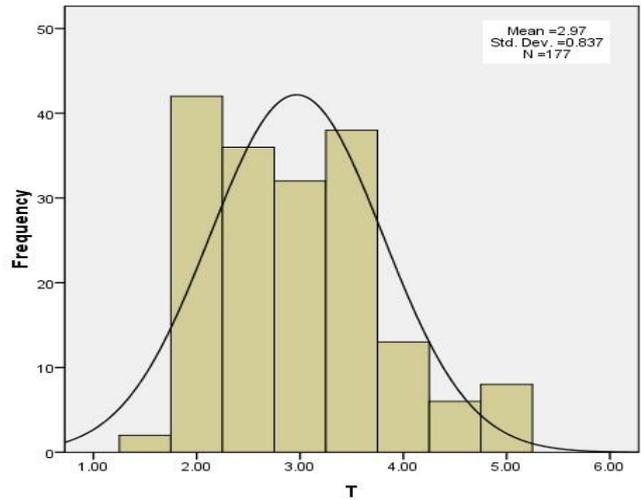


Figure 10. Histogram dimension of quality management in project

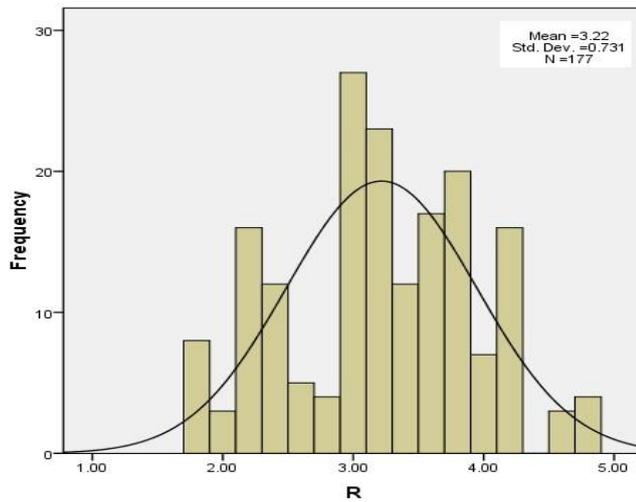


Figure 8. Histogram dimension of project communication in project

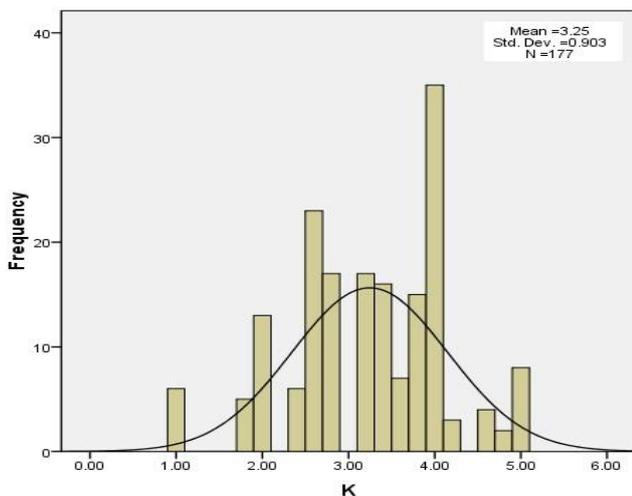


Figure 9. Histogram dimension of risk management in project

6. Conclusion

The issue of performance of urban development projects, despite its high importance in saving time and money and project resources and increasing the profitability of projects, has been less studied for various reasons that can be a useful research field for researchers. According to the results and analysis, it can be concluded that the lack or weakness in the nine standard management (integration management - scope - time - cost - quality - human resources - communications - risk and procurement) are effective in project deviations and the lack of Cost management or weakness in this management has the greatest impact on project management.

- A) Therefore, it can be said that lack of (weakness) in projects in Tehran has a great impact. Also, according to the value of the coefficient of determination, it can be said that (weakness) is effective in project management by 0.672.
- B) Therefore, it can be said that lack of (weakness) in projects in Tehran has a great impact. Also, according to the value of the coefficient of determination, it can be said that (weakness) is effective in project communication management of projects in Tehran by 0.622.
- C) Therefore, it can be said that the lack of (weakness) in project human resource management has a great impact on project deviations in Tehran. Also, according to the value of the coefficient of determination, it can be said (weakness) in the human resource management of the project is effective in the deviations of projects in the city of Tehran by 0.780.
- D) Therefore, it can be said that the lack of (weakness) in project quality management in projects in Tehran has a great impact. Also, according to the value of the coefficient of determination, it can be said that (weakness) in project quality management is

effective in the deviations of projects in the city of Tehran by 0.620.

- E) Therefore, it can be said that lack of (weakness) in project cost management has a great impact on project deviations in Tehran. Also, according to the value of the coefficient of determination, it can be said (weakness) in project cost management in project deviations in the city of Tehran is effective at 0.710.
- F) Therefore, it can be said that lack of (weak) in project time management has a great impact on projects in Tehran. Also, according to the value of the coefficient of determination, it can be said that (weakness) in project time management is effective in project deviations in the city of Tehran by 0.746.
- G) Therefore, it can be said that lack of (weakness) in projects in Tehran has a great impact. Also, according to the value of the coefficient of determination, it can be said (weakness) in the management of the project area is effective in the deviations of projects in the city of Tehran by 0.710.
- H) Therefore, it can be said that lack of (weakness) in projects in Tehran has a great impact. Also, according to the value of the coefficient of determination, it can be said that (weakness) in project integration management in Tehran city projects is effective at the rate of 0.706.

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