EFFECT OF HUMAN RESOURCE MANAGMENT ON CONSTRUCTION PROJECT PERFORMANCE IN EGYPT

By Abd El-Rahman, S.[1] Abdel-Hamid, M.[2], Mohamed Ali, S.[3], Abdelhamid, M.[4]

Abstract

This paper investigates the effect of Human Resources Management (HRM) functions and implementation in the construction projects performance in Egypt. This study introduced the concept of HRM in general and in the construction projects in particular. Four key performance indicators namely: quality, quantity, time, and cost were used to evaluate the performance of the construction projects. Data were collected from 55 construction firms using questionnaire and interview techniques. The collected data were analyzed using the SPSS package. The analysis results revealed that there are strong relationships between human resource management factors and construction projects performance specially team work factor, and motivation factor so that a technique was developed to improve project overall performance for firms that do not apply human resource management systems.

Keywords:

Human Resources Management (HRM), Projects performance, Construction projects

[1] MS_c. in Civil Engineering, Civil Engineering Department, Faculty of Engineering at Shobra, Benha University, Egypt.

[2] Lecturer, Civil Engineering Department, Faculty of Engineering at Shobra, Benha University, Egypt.

[3] Lecturer, Civil Engineering Department, Faculty of Engineering at Shobra, Benha University, Egypt.

[4] Professor, Director of Construction Engineering and Management Institute, Housing and Building National Research Center (HBRC)

Aim and Scope of Research

The aim of this study is to determine the effect of human resource management on project performance in the construction firms in Egypt and to rank the factors of human resource management that affect project performance. With respect to the very vast subject regarding human resource management in construction projects, therefore, this particular work will focus on some factors of human resource management and its effect on performance within the construction projects in Egypt. Subsequently, evaluate and rank the importance and frequency of human resource management factors that affect the performance in construction projects. Next, the study will also put forward the strategies to maximize the performance, based on established ideas from various references, journal, articles, working papers and newspapers. Finally it should be noted that all the issues, facts, ideas as well as proposal that will be presented in this study will only focused on those related to the scenario of construction industry.

Introduction

The Construction Industry has attained a broad spectrum of employees making it a labor intensive industry, more especially, in developing economies (Fellows et al., 2003). History about the Egyptian construction industry shows that the construction sector is one of the most dynamic sectors of the Egyptian economy, has been growing rapidly since the 1980s. The basic goal of construction project delivery is to enhance quality of product within the right duration and at the right cost, which will require amongst others a highly skilled and committed workforce. The adoption of appropriate Human Resource Management (HRM) practices to enable workers and their employing organizations reach a mutual understanding "about the nature and objectives of the employment relationship between them and then to fulfill these agreements" (Torrington et al., 2001) will positively influence this cause. The organizations philosophy on how to manage its workforce, its policies, therefore needs to be well defined to enhance its ability to attract and retain the right caliber of employees to provide it (the organization) with the required competitive advantage (Armstrong, 2003). While there are many variables that affect the outcome of projects, the performance measures identified in the study reflected the factors within the control of PMs (i.e. those relating to improvement in their personal skills). Therefore, for the purposes of this paper, the term "performance" is defined as the behavioral actions (i.e. behavioral competencies) that are relevant to achieving the goals of project-based organizations (Alfed, L.E. 1988). Improving human resource management (HRM) through the application of performance measures has been recognized as one of the most critical elements for organizational competitiveness and improvements (Dainty, et al, 2004).

Human Resource Factors

Some factors of human resources such that: training, development, motivation and teamwork. Training and development is defined as a process of developing work-related knowledge and skills in employees for the purpose of improving performance systematically (Swanson, 1999). Also the motivation is one of the human resources factor. A definition of motivation is "the set of processes that determine the choices people make about their behaviors" (Wellington, et al, 2008). Motivating is the work

managers perform to inspire, encourage and impel people to take action (Wellington, et al, 2008). In a training context, motivation can influence the willingness of an employee to attend the training program (Maurer, 1994), to exert energy toward the program, and to apply what they learn in the program onto the job. Thus, it is likely that trainees cannot reap the full benefits of training without the consideration of training motivation (wei-tao, 2006). Colquitt et al. (2000) suggested that even if trainees possess the ability to learn the content of a course, they might fail to benefit from the training because of low motivation. To encourage worker participation, managers are advised to use a system that identifies and rewards workers who do a good job. For example, construction workers can receive a financial bonus for identifying ways to improve the quality of their company's operations (Bart, 1996). Finally, team belonging is another powerful motivator in construction workers. A high performance workplace focuses on increasing people's influence on the business as well as the impact of processes, methods, the physical environment and technology and tools that enhance their work (Ahadzie et al., 2008). A high performance workplace invests in its human resources and supports their technical and innovation skills. In the case of the construction industry, the project teams from the focus of working life in the industry. According to Raiden and Dainty (2006), the changing requirements of construction activities necessitate the companies to form different teams each time a new project is undertaken. "Therefore, any policies and practices that are applied by the companies in order to improve teamwork activities can have effects on the performance of their projects (Tabassi et al., 2011)." For some, the topic of teamwork in organizations is of only peripheral concern. However, it is worth noting Blanchard's (1988) comments: "most managers spend no less than 50% and possibly as much as 90% of their working time in some type of teamwork activity. Teams are the backbone of organizations. They can produce more and better solutions to problems than individuals can".

Performance Measures

The term "performance" is defined as the behavioral action (i.e. behavioral competencies) that are relevant to achieving the goals of project-based organizations (Alfed, L.E. 1988). The implication of this definition is that; performance, behavior and results are not the same. Performance is defined as worth ratio where worth defined as value divided by cost. In other word, competent individuals create worth by creating valuable accomplishments while minimizing costly methods. Three categories of measurements, encompassing six dimensions are sufficient to describe every aspect of construction performance : Quality (Accuracy & Workmanship), Quantity (Productivity & Schedule) and Resources (Manpower & Materials, tools, and equipment). Productivity and schedule are considered the primary dimensions in measuring performance. Productivity is defined as a ratio that relates measurements of the output to measurements of input. The ratio is often given as: Productivity = Output / Input. Various definitions of performance measures exist in the HRM field stemming from the different interpretations often given to the meaning of the term "performance" (Yassamis et al, 2002). While traditionally, performance measures have been conceptualized based on the output-based measures of time, cost and quality, recently researchers have argued that a more appropriate conceptualization should reflect behavioral competencies (Yassamis et al, 2002). The proponents of this emerging concept (i.e. those supporting behavioral

competencies) contend that performance measures founded on key behavioral attributes are more rigorous in the sense that, they offer a better opportunity for PMs to engage in continuous performance improvement (Dainty et al, 2003). Furthermore, performance measures are often the only potential means for evaluating the theories of work behavior; the effective administration of human resources and the provision of feedback to management personnel. Thus, performance measures are essential for providing organizations the basis for planning management succession and development at the workplace. To this effect, performance measures represent the most important human resource scheme insofar as they represent critical decisions integral to a variety of human resource actions and outcomes. In recent times, there has been renewed interest in research into the development of performance measures as the only viable option for validating effective managerial performance. To enhance and maintain the competitive edge, successful organizations are therefore relying on their managers and other key human resource personnel acquiring a range of skills through the development of appropriate performance measures. Similarly, in most project-based industries such as construction, it is becoming increasingly important for organizations to proactively manage the performance of key management personnel towards the desired growth and direction of competitive advantage (Dainty et al, 2004). In construction, higher productivity means seeing the final result sooner, which in turn creates satisfaction. Job dissatisfaction can be one factor that will increase costs, produce time delays and generally reduce productivity on most types of projects.

Methodology and Questionnaire Design

In this study, in order to cover a wide range of the Egyptian construction firms, it has been decided that the field survey will depend on a questionnaire as the basis for data collection. A pilot study was conducted on ten construction firms in order to find out the shortcomings and the ambiguous in the first draft of the questionnaire. The participants in the pilot sample were chosen to be characterized by good experience and background in order to positively improve the questionnaire. They were from public and private sectors. The pilot studies were carried out by personal interviews to ensure the clarity and relevance of the questionnaire to respondents. Based on their responses, one question in the questionnaire was more clarified to assure that the given data will result in appropriate results and conclusions, and another one has been added. The aim of the questionnaire is to identify relative importance and frequency of occurrence of the effect of Human Resource Management on performance of construction projects in Egypt. The questionnaire was divided into three parts. The first part is general information about the person who fills the questionnaire. The second part is concerned with the information about the construction firms included in the surveyed sample regarding the following firm characteristics (Firm type, Firm size, organizational structure, and Applied management system in the firm). The third part aims to obtaining the key finding of human resource management applied in the firm, in order to explore the following (Basis of organization decisions making approaches, Human resource management systems indicators, Human resource characteristics, and Factors of human resource management and its effect on construction project performance). All the questions in the main part of the questionnaire are closed – question with a five point increasing scale with 1 indicating the lowest and 5 indicating the highest one. A total number of 100 questionnaires were

distributed on Egyptian construction firms during the period from October 2012 to January 2013. The distribution was carried out as following: 30 questionnaires were mailed. 5 out of 30 mailed questionnaires were returned (approximately 17% response rate). So, for quick response, decided to distribute the questionnaire personally and collected by hand. This method was effective as there is direct communication between the researcher and respondent. 50 were returned from the personally delivered questionnaires there for a total of 55 out of 100 questionnaires were returned. To maximize the response rate, the quality and the credibility of those questionnaires, they were usually filled by project managers, seniors of managers, and engineering with experience more than four years. Finally 55 questionnaires were ready to be analyzed (55% response rate).

The Effect of Human Resource Management Factors on Project Performance

There are major characteristics of human resource as gender, age, education, and years of experience and percent of temporary labors. The sample results show that the number of women is medium, the majority of the firms in construction field have an average age between 25-40 years old, the construction field includes approximately medium percentage of employee with higher education, and approximately medium percentage of technical's with university studies, the majority of the firms have more than 20 years of experience in construction field which assures their trusting data, and approximately three third of the firms agree that the percentage of temporary labors represents 0-10% of the total number of the working staff and 80% of firms use the same temporary labors in different projects which grantees the performance homogeneity and loyalty on the long run. It is believed that there is a relation between all these characteristics and the effect of human resource management factors on project performance. So across tabulation was made to measure the correlation between them. The study depends on a number of factors to identify the current practice of HRM such as motivation, team work, training and development of employees, and communications and its effect on project performance. Across tabulation was made to measure the correlation between the effects of these factors on project performance. Figure (1) shows the effect of different kinds of motivation system on increasing project quality, found that 22% from the firms on sample which use incentive as a motivation way show that it has most effect on increase project quality and 8% from the firms on sample which use recognition as a motivation way show that it has most effect on increase project quality. Table (1) show that: Motivation is significant factor only on project (quality, quantity and cost), Team work is significant factor on project performance, Employees satisfaction is significant factor only on project quality, Training and development of employees is significant factor on project performance, and Communications is significant factor only on project time.

Ranking of the Effect of HRM Factors on Project Performance:

To determine the relative ranking of the significant causes of each group of respondents and the possible ways of dispute prevention, the following formula (Tam et al, 2000) was used: Relative Importance Index (RII) = $\sum W/(A \times N)$ Where, W is the weighting given to each cause by respondents, ranging from 1 to 5, A is the highest weight (5 in the study), and N is the total number of samples.

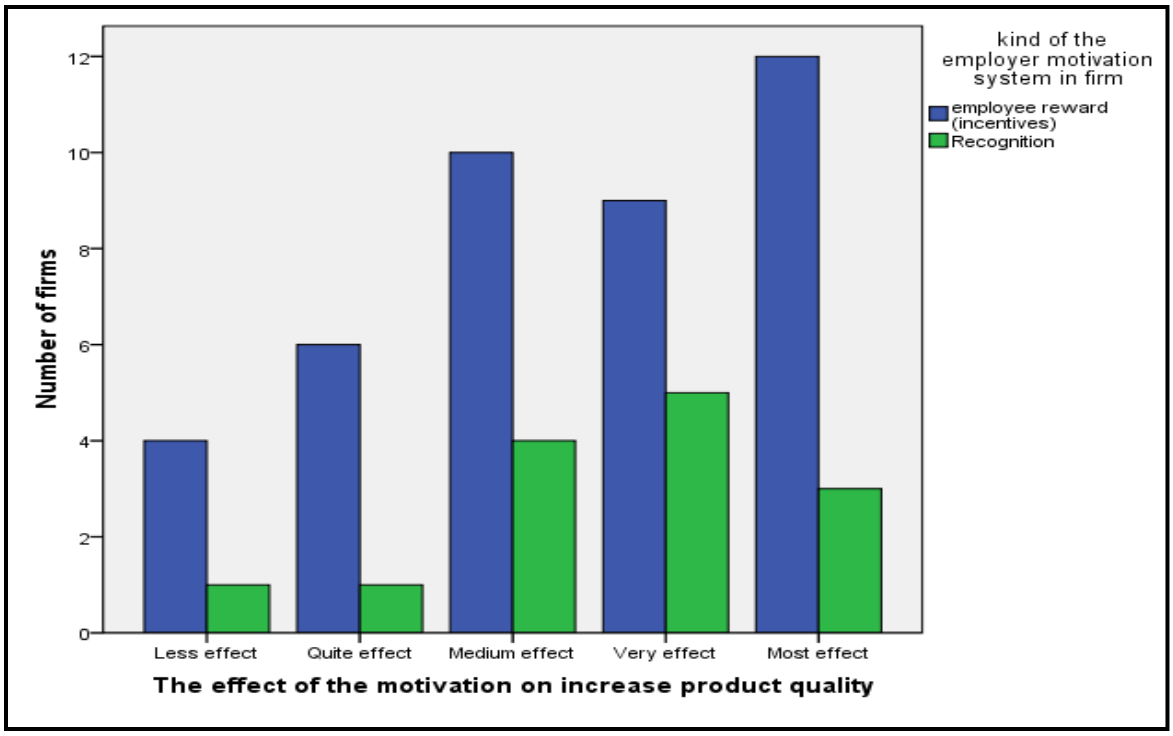

Figure (1) The Effect of Motivation on Increase Project Quality

Table (1) Cross Tabulation of HRM Factors Effect Versus Project Performance

Measurement Indicator			Statistical Measure			
				Value	Approx. Sig.	Relation
Effect of Human Resource Management Factors on Project Performance	Motivation	(Increase product Quality)	Gamma	0.530	0.084	Medium
		(Increase product Quantity)	Gamma	0.568	0.011	Medium
		(Decrease time)	Gamma	0.213	0.006	weak
		(Decrease cost)	Gamma	0.499	0.061	Medium
	Team Work	(Increase product Quality)	Gamma	0.551	0.005	Medium
		(Increase product Quantity)	Gamma	0.622	0.002	Strong
		(Decrease time)	Gamma	0.700	0.009	Strong
		(Decrease cost)	Gamma	0.625	0.024	strong
	Employees Satisfied	(Increase product Quality)	Gamma	0.415	0.009	Medium
		(Increase product Quantity)	Gamma	0.265	0.011	Weak
		(Decrease time)	Gamma	0.234	0.082	Weak
		(Decrease cost)	Gamma	0.257	0.032	Weak
	Training and Development of Employees	(Increase product Quality)	Gamma	0.634	0.039	Strong
		(Increase product Quantity)	Gamma	0.478	0.038	Medium
		(Decrease time)	Gamma	0.415	0.027	Medium
		(Decrease cost)	Gamma	0.509	0.022	Medium
	Communications	(Increase product Quality)	Gamma	0.218	0.090	Weak
		(Increase product Quantity)	Gamma	0.259	0.084	Weak
		(Decrease time)	Gamma	0.400	0.008	Medium
		(Decrease cost)	Gamma	0.218	0.091	Weak

Table (2) and figure (2) illustrate the rank of the effect of human resource management factors on increase project quality. The result shows that training and development of employees have the highest impact on increasing the quality of the project, followed by the motivation of employees, then team work factor which have a medium effect on increasing the quality of the project, followed by employees satisfied which have a quit effect on increasing the quality of the project, finally the communications factor comes on the end rank of the factors because of having the least effect on increasing the quality of the project. Also, figure (3) illustrates the effect of human resource management factors on increase project quantity the result shows that team work factor have the highest impact on increasing the quality of the project, and the communications factor comes on the end rank of the factors because of having the least effect on increasing the quality of the project. Figure (4) shows that the effect of human resource management factors on decrease project time and the results show that team work factor have the highest impact on decreasing the time of the project. Figure (5) shows that the rank of the effect of human resource management factors on decrease project cost and the results show that team work factor have the highest impact on decreasing the cost of the project, and the employees satisfied factor comes on the end rank of the factors because of having the least effect on decreasing the cost of the project.

Table (2) Rank of The HRM Factors Effect on Project Quality

Effect of each of the HRM factors on Quality	Scale (5-1)	Degree of relative importance quoted by the respondents	Total number of respondents	∑ W	(RII) = ∑ W/ (A×N)	Rank
Motivation	Most effect	15	**55**	**15*5 + 14*4 + 14*3 + 7*2 + 5*1 = 192**	**192/(5*55) = 0.698**	**2**
	very effect	14				
	medium effect	14				
	quite effect	7				
	less effect	5				
Team Work	Most effect	8	**55**	**191**	**0.695**	**3**
	very effect	20				
	medium effect	18				
	quite effect	8				
	less effect	1				
Employees Satisfaction	Most effect	10	**55**	**149**	**0.542**	**4**
	very effect	4				
	medium effect	9				
	quite effect	24				
	less effect	8				
Training and Development of Employees	Most effect	19	**55**	**197**	**0.716**	**1**
	very effect	13				
	medium effect	10				
	quite effect	7				
	less effect	6				
Communications	Most effect	3	**55**	**96**	**0.349**	**5**
	very effect	4				
	medium effect	4				
	quite effect	9				
	less effect	35				

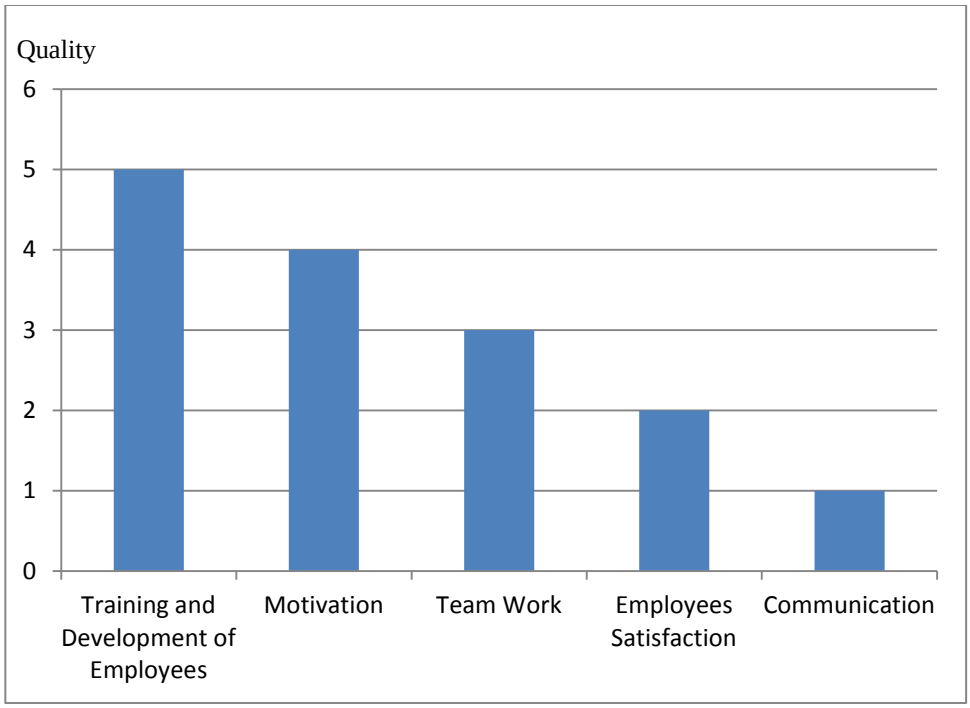

Figure (2) Effect of Human Resource Management Factors on Project Quality

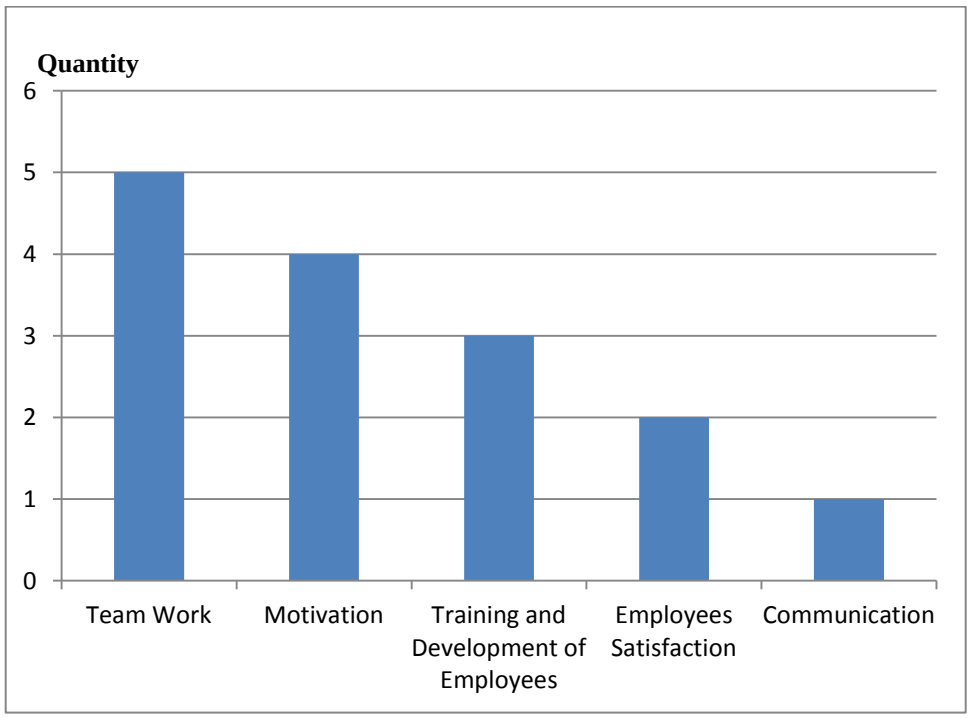

Figure (3) Effect of Human Resource Management Factors on Project Quantity

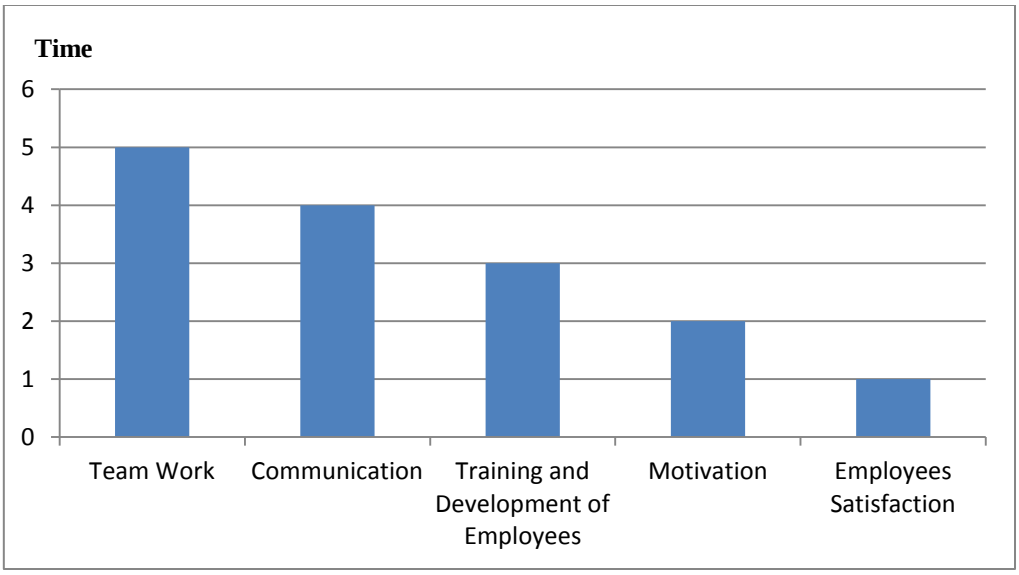

Figure (4) Effect of Human Resource Management Factors on Project Time

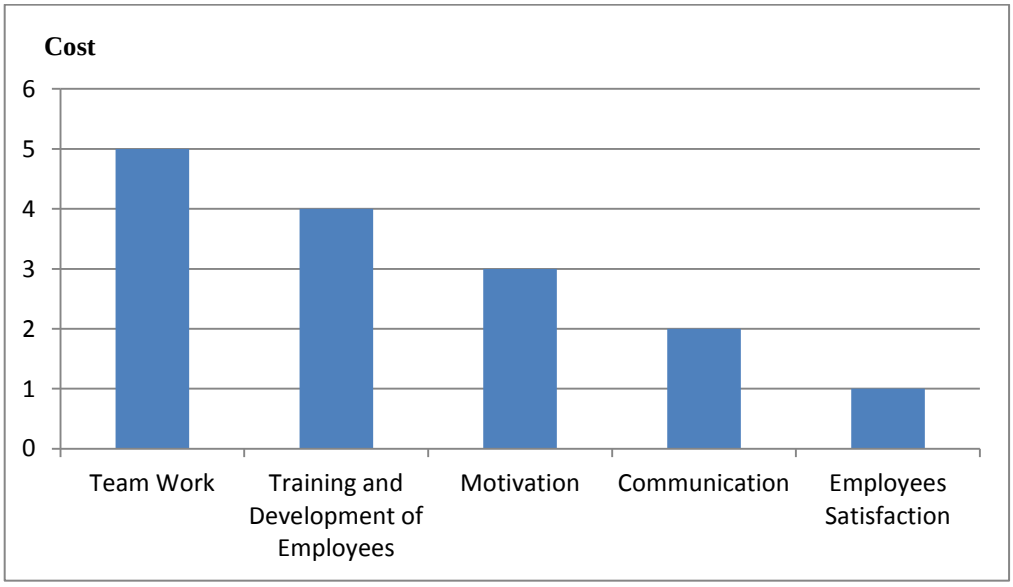

Figure (5) Effect of Human Resource Management Factors on Project Cost

Figure (6) illustrates the rank of the effect of human resource management factors on increase project performance the result shows that team work factor have the highest impact on increasing the performance of the project, followed by the motivation of employees, and training and development of employees have a medium effect on increasing the performance of the project, followed by the communications factor which have a quit effect on increasing the performance of the project, finally employees satisfied comes on the end rank of the factors.

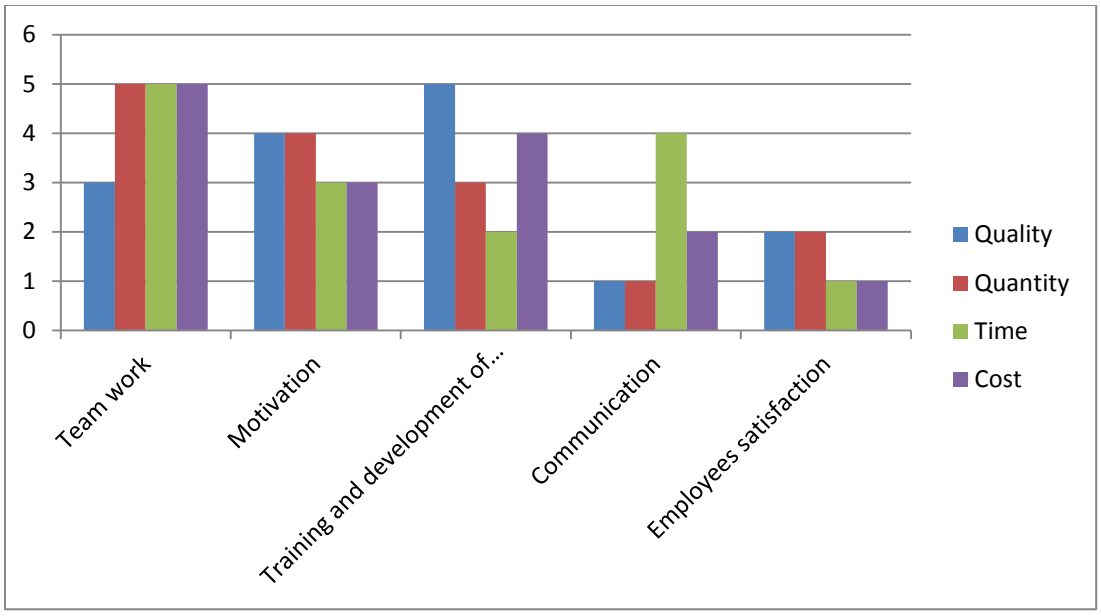

Figure (6) Effect of Human resource management factors on Project Performance.

Human Resource Management Practices in Egyptian Construction Firms

A model to improve projects performance was developed for firms which do not apply HRM system. Figure (7) shows the developed model structure where the start point for this model is to start with the most effect HRM factors according respondents replies which are team work, motivation, training and development, communication and employ satisfaction. Among these factors the model start with two high effect factors on project performance team work and motivation activities as an input for the model. The out but the model short term will increase utilize of resources, and on long term will increase indicators of project performance like quality, quantity and etc. The increase in project performance indicators will increase the firm overall performance which will be the endpoint of the model as shown in figure (8).

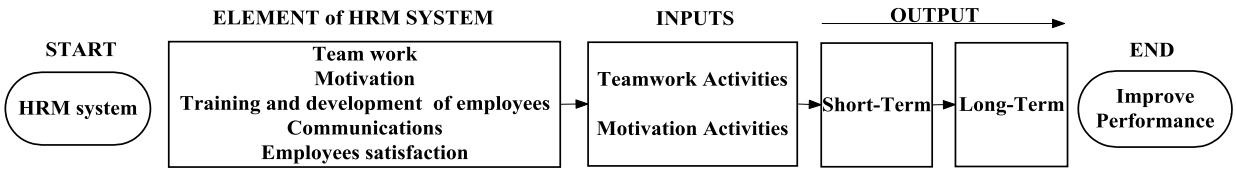

Figure (7) Developed model Structure

Model Implementation

The model will be implemented for firms which do not apply HRM management and it will be apply as following: The model will be applied on all levels of employers by create HRM department in the firm. The job of HRM department is design the team in a properly way, with membership, size and resources match the task, held meetings between team members to develop team goals and a shared vision, held workshops for

training on co-ordinate effort and planned sharing of tasks evenly across the team, increase a sense of common ownership of the task at hand and joint responsibility for its achievement and commitment by team members to understand and identify with one another's goals as an activities of team work. Also the HRM will be responsible for apply motivation activities such as use well-designed reward system, apply rewards to teams, rather than individuals, and they recommend, for example, giving an award of recognition to the ‘‘Crew of the Month”, increase employee feeling that their participants is important in making firm successful, make team members free to make suggestions and give teams the opportunity to ‘‘self manage”.

Conclusion

The study focuses on the need to maintain and enhance one of the most fundamental aspects in organization: human resource management (HRM). The study also emphasizes the necessity of applying human resource management factors so as to improve the overall performance in construction organizations in Egypt. Based on the investigation conducted on the construction firms by means of a questionnaire which was sent to 100 firms, analysis of the obtained data, and interpretation of the results, the following conclusions have been obtained. Motivation, team work, employees satisfaction, training and development of employees, and communications are significant factor on project performance. The majority of the firms show that the most effective key to measure performance in construction firms is the cost. The rank of the effect of human resource management factors on increase project performance the result shows that: team work has the first rank, followed by motivation factor which have second rank, followed by training and development of employees factor which have third rank, followed by communications factor which have fourth rank, and finally employees satisfied factor comes on the end rank.

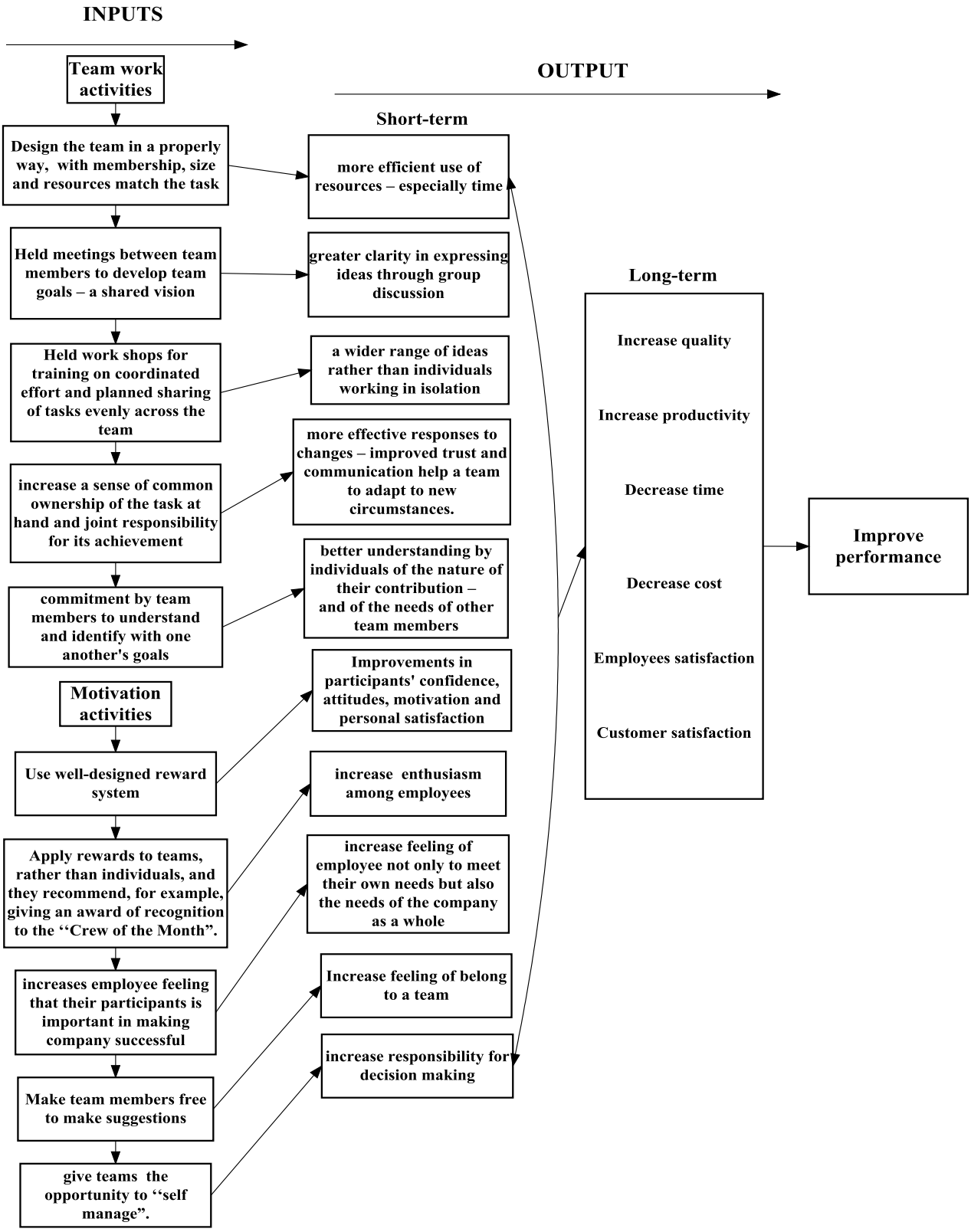

Figure (8) Developed Model

References

- **Ahadzie DK, Proverbs DG, Olomolaiy P (2008):** Towards developing competency-based measures for construction project managers: Should contextual behaviours be distinguished from task behaviours? Int. J. Proj. Manage, 26: 631-645.
- **Alfed, L.E. (1988):** Construction Productivity On-Site Measurement and Management, Mc-Graw-Hill Book Company, New York, San Francisco, Aukland, Bogota, Hamburg, London, Madrid. Mexico, Milan, Montreal, New Delhi, Panama, Paris, Sao Paulo, Singapore, Sydney, Tokyo and Toronto. 234 p.
- **Armstrong, M. (2003):** A Handbook of Human Resource Management Practice. 9th Edition. London and Sterling, VA: Kogan Page.
- **Bart J. McGraw-Hill's (1996):** Best practices for housing construction. New York: McGraw-Hill.
- **Blanchard K (1988):** Shaping team synergy. Today's Off, 22(6): 6-11.
- **Colquitt JA, LePine JA, Noe RA.(2000):** Toward an integrative theory of training motivation: a meta-analytic path analysis of 20 years of research. J Appl Psychol 2000; 85:678–707.
- **Dainty, A.R.J., Mei-I Cheng and Moore, D.R. (2004):** A competency-based performance model for construction project managers, Construction Management and Economics, Vol. 22, pp. 877-886.
- **Dainty, A.R.N, Cheng Mei-I and Moore , D.R. (2003):** Redefining performance measures for construction project managers: an empirical evaluation. Construction management and Economics, Vol. 21, pp. 209 –218.
- **Fellows, R. and Liu, A. (2003):** Research Methods for Construction, 2nd ed, Blackwell Science, Oxford, 54 P.
- **Maurer TJ, Tarulli BA.(1994):** Investigation of perceived environment, perceived outcome, and person variables in relationship to voluntary development activity by employees. J Appl Psychol 1994;79:3–14.
- **Raiden AB, Dainty ARJ (2006):** Human resource development in construction organizations An example of a "chaordic" learning organization? Learn. Organ., 13(1): 63-79.
- **Swanson R.(1999):** HRD theory, real or imagined? Human Resour Dev Int 1999;2(1):25.
- **Tabassi AA, Ramli M, Bakar AHA (2011):** Effects of training and motivation practices on teamwork improvement and task efficiency: The case of construction firms. Int. J. Proj. Manage. doi 10.1016/j.ijproman.05.009
- **Torrington, D., Hall, L., and Taylor, S. (2001):** Human Resource Management. 5th Edition. Prentice Hall.
- **Wei-Tao T.(2006):** Effects of training framing, general self-efficacy and training motivation on trainees' training effectiveness. Person Rev 2006;35(1):51–65.
- **Wellington Didibhuku Thwala1, Lydia Nthabiseng Monese2(2008):** "Motivation as a tool to improve productivity on the construction site" Department of Quantity Surveying and Construction Management, University of Johannesburg.
- **Yasamis, F., Arditi, D and Mohammadi, J. (2002):** Assessing contractor quality performance, Construction Management and Economics, Vol. 20, pp. 211-22