Journal of Engineering and Applied Sciences 11 (5): 967-975, 2016
ISSN: 1816-949X

Develop Center of Excellence (COE) at Power Plant Projects in Southern Iran with Conceptual Model Approach to Supply Chain Management in Construction Industry Projects

[1]Mohammad Hossein Sobhieh, [1]Rasoul Karimi, [2]Jafar Razmi and [2]Seyed Ali Torabi
[1]Department of Project Management and Construction,
Tarbiat Modarres University, Tehran, Iran
[2]Department of Industrial Engineering, Tehran University, Tehran, Iran

Abstract: Human capital management is one of the strategic factors in the success of projects. However, the role of strategies for effective management of human capital as one of the major issues in managerial challenges of project-based organizations and its impact on the success of supply chain projects have been less studied. In this study, using the approach presented in the conceptual model of supply chain management projects in the construction industry and using the grounded theory strategy, the challenges related to human resources extracted and the effect of organizing human capital in the form of Center of Excellence (COE) in achieving the goals and managing challenges of supply chain were analyzed using analytical hierarchy at three power plant construction in Southern Iran. The results show that establishing center of excellence can be effective in achieving chain goals with regard to the specific characteristics of human capital in this Iranian geographic area.

Key words: Centers of excellence, human capital, supply chain project, power plant projects in Southern Iran, theory

INTRODUCTION

Studies show that the human capital management is one of the success factors in the projects according to the current challenges in project-driven organizations (Pinto and Slevin, 1988) and talented and innovative human resource is known as a source of empowerment and effective in the success of the project in Iran.

Keegan and Turner (2003) have shown that project-driven organizations need to have different strategies in the management of human capital compared to the classical approach to human capital management in the task-based operational organizations. As a result, policies and procedures should support project-based activities considering the need to integrate human capital management strategies with organizational strategy and human capital management challenges in these organizations (Lengnick-Hall and Lengnick-Hall, 1988).

On the other hand, study the strategies suggest that human capital management strategies would be effective in project-based organizations when they can be implemented commensurate with the challenges in all project-based organizations involved in the project and in other words, in the entire supply chain project loop in a coordinated and integrated manner.

According to the above, this study, in the first stage and by using the grounded theory approach, identifies challenges of human capital management as one of the challenges within the supply chain at three power plant construction project in southern Iran and extracted the strategies of using centers of excellence as an effective strategy for managing challenges and achieving the objectives of supply chain. In the second stage, the importance of implementing this strategy in the chain management challenges by using quantitative Hierarchical Analysis (AHP) has been assessed.

Theoretical foundationsL: Keegan and Turner (2003) have shown that project-driven organizations require a different approach compared to the classical approach of human resource management, which is accepted in operational-driven organizations (Fig. 1).

Despite these differences, there are limited strategies on the field. For example, the Body of Knowledge in the Project Management (PMBOK) describes the human capital management in the form of general process groups which include the institutional inputs in the input section, organizational structure and job descriptions in tool section and participation and commitment in techniques section. However, the challenges and strategies in the field of human capital management has not been investigated in this configuration (PM1, 2013).

Corresponding Author: Mohammad Hossein Sobhieh, Department of Project Management and Construction, Tarbiat Modarres University, Tehran, Iran

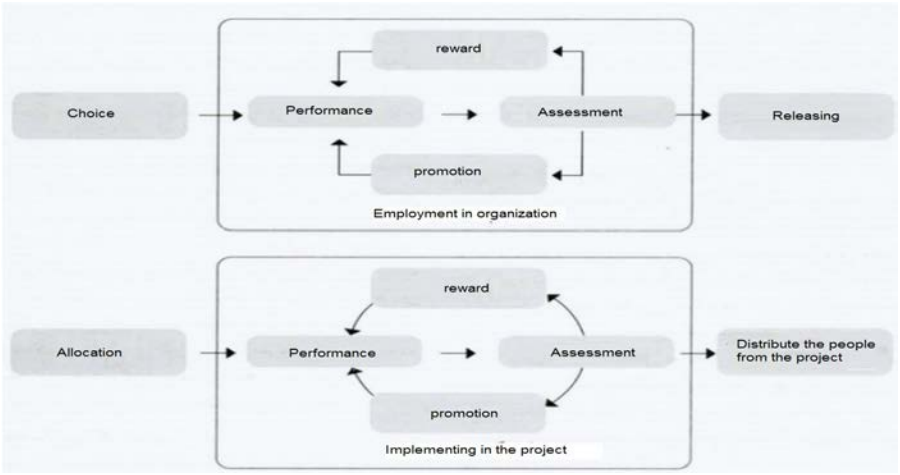

Fig. 1: Approaches of human resource management in the task and project-driven organizations

Table 1. The challenges of human resource management in the project-based organizations (Turner et al., 2008)

Variable	Explanation
Temporary nature of the project	Create new combinations in temporary human resources (when projects begin) Dissolve the combination of human resources (when the projects are completed) Responsible for development remuneration and evaluation of employees' personal characteristics related to career development
Work environment	Difficulty in predicting future human resource requirements. The need to attract temporary staff to meet fluctuating demand of resources Workload could rise with increase in demand for project or unforeseen customer demands
Non-deterministic requirements	Taylor's model for matching employees with job not really make sense Inability to define work conclusively Need to find people able to work inproject and develop activities and tasks needed in this regard. Difficulty in predicting future workloads project Difficulty in predicting future human resource requirements
Specific management	Need to adopt a project management paradigm culture as a strategic choice Employees need special qualifications to work in this environment. New and different educational structures may be needed
Sources of portfolio, and requirements of role	Different and often conflicting project requirements of role. Need to human resource management practices in order to assign people to several projects simultaneously and smoothing the demand between these projects
Business pressures on staff	Employee health and ethical behavior according to customer needs and project priorities are important. People are not sure about their future career and colleagues who work with them Lack of job security for contractors
Create development opportunities	Allocation in the project needs to relation to career development

Also, Turner *et al.* (2008) conducted a study to identify the current challenges in the field of human capital management in the project-based organizations. This study indicates that challenges are often dependent on issues such as temporary nature of the project, work environment, non-deterministic requirements and other factors (Table 1).

Despite the above challenges, Keegan and Turner (2003) have identified general processes in human resources management and providing strategies appropriate to these challenges and are deferred to future research. Bredin and Soderlund (2011) have expressed the results of their research in design agencies in their books. These studies provide the required processes for human capital management in projects based on several studies in Industrial Organization (Bredin and Soderlund, 2011).

In a study conducted in Iran, researchers have tried to determine the status of human resource management in projects and the importance of its processes by studying major and infrastructural project in various industries including oil and gas, petrochemicals, shipbuilding, steel and construction (Teimuri and Tavousi, 2007).

Research and other resources such as project maturity models focused on human capital management in projects but significant point in these investigations is lack of integrated strategies and challenges of human capital management and lack of attention to providing strategies in supply chain project as the coordinator for project-based organizations and its accrued features including ecology and geography of human resources in projects.

MATERIALS AND METHODS

The present study is a quantitative, qualitative, exploratory and interdisciplinary research by using interpretivism paradigm and overlaps in both supply chain management and project management. This study included project-driven organizations and three power plant projects in the context of human geography in Southern Iran been studied as the analysis unit. According to previous research, it must be said that supply chain management is a new theory and there are

weaknesses in its pattern, Grounded theory approach to realizing the objective of this study seems appropriate. One of the main strengths of Grounded theory approach is its emphasis on basic social processes and gain insight into social phenomena (Strauss and Corbin, 1998, Sohrabi *et al*., 2015). Also when we need a theory to explain the process we used Grounded Theory (Bazargan, 2008). In this part of the research, in-depth qualitative interviews were used as the primary means of data collection. In order to create focus of the interview, two techniques including follows the mood of the interviewee and key events were used for designing the questions. Collecting and analyzing data continued until theoretical saturation which means when there is no other newer data to receive. In order to analyze the data, we used grounded comprising the steps of axial and open coding and selective coding. In order to advance axial coding phase, the researchers used strauss and corbin paradigmatic model for integrating data.

In this study, three types of sampling including open, communicative and varied and discrimental contributed to collect and analyze the data. Accordingly, in three stages, 16 interviews were analyzed. After analyzing the interviews and studies conducted by previous researchers, the main questions about the phenomenon became revealed. After drawing the decision tree and according to the 16 interviewed in the first phase, at this stage a 10-member team of experts in supply chain management and project management prioritized the strategies. A questionnaire with Likert scale (1, 3, 5, 7 and 9) and software (Expert Choice) have been used to obtain the views and priorities. The results of compatibility of matrices showed that the values are higher than (0.8) which is an acceptable level.

RESULTS AND DISCUSSION

Implementation of research: The implementation of this study included identify conceptual model as a criterion for matching the extracted challenges in chain and the appropriate strategies, identify challenges related to human capital in the supply chain at the Power Plant Projects in southern Iran, the use of centers of excellence in the field of strategic human capital management challenges and prioritize the impact of this strategy on this challenge.

Conceptual model of supply chain management project: Conceptual model of supply chain management Project that was extracted using grounded theory research strategy, was used to identify the challenges in supply chain projects (Fig. 2).The components of conceptual model include process of emergence of challenges, the contingent challenges, the challenges in the chain, strategies and achieving the objectives.

The emergence of challenges is a process that leads to understanding the challenges and consequences associated with the challenges and continue to evaluate their causes. This process is a motivating factor for entering into the process of project organization and supply chain management project responds to this area. In particular, answering the question why an organization measures supply chain management project with the advent of the challenges can be explained through the following steps:

Fig. 2: Conceptual model of supply chain management projects in the construction industry

The operating environment of project supply chain leads to challengesor there are factors within the supply chain project which leads to challenges and as a result, disrupts the chain's mainstreams. Hunger and Villain believe that environmental exploration is the process of monitoring, evaluation and providing environmental information to avoid disasters and ensure the long-term health of the organization (Khodadad and Azizi, 2010). In general, there are three types of environment in supply chain: macro environment, task or close environment and internal environment. The macro environment include the forces that do not impact directly on short-term activities of the organization; but rather, firsly, they have an indirect impact and secondly, they are effective in long-term organizational decisions.

Project supply chain challenges, including those factors disrupting the flow of material, information, finance and communication in the project which can reduce the effectiveness of the supply chain and threaten the projects by creating sustainable competitive advantage in the project supply chain.

Theoretically, the underlying factors are a king of factors that causes formation of stable patterns in supply chain management through project organization. In the project supply chain management, the underlying factors help the project organization in order to determine the parameters directing the process of extracting the solutions in the supply chain project. The underlying factors in the formation of challenges have been divided into three categories of sub-project platform, organizational platform and chain platform.

The contingency factors are conditions in which the project when supply chain management projects need to develop contingency measures against disruptive events. Due to the nature of the conditions created by these factors, how to respond to these requirements and factors also depend on the situation. These factors have also led the way for decisions and actions, such as elements of the project organization during the supply chain management. But there is a major difference between them. While the main feature of underlying factors is their stability over time and place but the contingency factors do not have this feature and to be changed over time and space. Supply chain management strategies project actually consists of a series of actions and decisions that lead to project supply chain challenges. As well as the opportunity to create a supply chain with minimal cost and provides maximum flexibility.

Implementation of identified strategies can ultimately lead to achievement of the organizational goals. Interview results show that the achievement of these goals can be achieved through the formation of two categories. The first dimension of success is the category of project's success and the second dimension of success comes from the strategy execution and it is the category of supply chain success of the project. A survey conducted in the model shows that the chain's success can be studied in terms of agility and pure concept of supply chain project. Identify challenges associated with the human capital of the supply chain at Power Plant Projects in Southern Iran.

As mentioned above, the supply chain of these three power plants in southern Iran has been examined at this stage. The main criteria in selecting these projects, challenges and solutions for the supply chain leads to supply chain success or failure in achieving the objectives of the project and supply chain projects. The three chains are: Damavand Petrochemical Steam Power Plant, South Pars Gas Power Plant and Ganaveh combined cycle power plant.

Construction of the plant can be introduced as one of the case studies that is less able to achieve its original goals. According to the schedule, the project should had been completed within 3 years however, this work was completed after 7 years. Damavand steam and electrical projects is located in a land area of 17.07 ha in Pars-Assaluyeh Special Economic Energy Zone.

To identify the challenges within the supply chain project, interviews were conducted in each link in the chain. During interviews, we tried as much as possible to interview with representatives of the employer, contractor and consultant as key members of the chain. For this purpose, 7 interviews were conducted. Table 2 show the identified challenges of human capital management in the supply chain.

The second case involves the supply chain project of South Pars Power Plant. The project could be considered as one of the case studies, which has been able to achieve its original goals. South Pars gas power plant is located in Bushehr, port of Assaluyeh, in the vicinity of the South Pars gas refineries, North East phases 15 and 6 with a capacity of 1000 MW, including 157.5 MW gas unit (model V94.26, made by MAPNA [TUGA , under license from Siemens] in an area of 28 ha.

To identify the challenges in the supply chain project, 6 interviews were conducted in each link in the chain, including employer, contractor and consultant. Table 3 shows the identified challenges of human capital management in the supply chain project.

The second case study involves the supply chain project in the construction of Ganaveh combined cycle power plant. Ganaveh combined cycle power plant project can be considered as one of the case studiesthat partly has managed to achieve its primary goals and a total of approximately 2% deviated compared to its schedule.

Table 2: The most important identified challenges in human capital management within the supply chain of damavand project

The identified challenge	Source of challenge: Employer	Contractor	Consultant	Subcontractor	Other	The main categories corresponding to the model	Sub-categories and corresponding concepts in the mode
Displacement manpower on the implementation of activities has been interrupted		✓				Chain's challenges	Strategic challenges: specialization and breaking project
The impossibility of taking advantage of skilled manpower at the site due to project location		✓				Chain's challenges	Strategic challenges: specialization and breaking project
A number of technical contractors have little technical ability			✓			Chain's challenges	Strategic challenges: specialization and breaking project

Table 3: The most important identified challenges in human capital management within the supply chain of South Pars power plant

The identified challenge	Source of challenge: Employer	Contractor	Consultant	Subcontractor	Other	The main categories corresponding to the model	Sub-categories and corresponding concepts in the mode
We cannot make use of specialists on the site because of destabilization in human resources		✓	✓	✓		Chain's challenges	Strategic challenges: specialization and breaking project
Localization of manufacturing equipment can solve many problems. A foreign supervisor has very problems but Tuga's supervisor can be brought within one day				✓		Project's contingency factors	Project factors: lack of resources

Table 4: The most important identified challenges in human capital management within the supply chain of Ganaveh power plant project

The identified challenge	Source of challenge: Employer	Contractor	Consultant	Subcontractor	Other	The main categories corresponding to the model	Sub-categories and corresponding concepts in the mode
Lack of management for building contractor has led to unfinished construction tasks		✓		✓		Chain'sc hallenges	Strategic challenges: specialization and breaking project
Experience and expertise are key factors in our projects. But we cannot hire an expert engineer for the project		✓		✓		Chain's challenges	Strategic challenges: specialization and breaking project
Skilled worker does not want to work in a temporary environment						Chain's challenges	Strategic challenges: specialization and breaking project

Ganaveh combined cycle power plant consists of two units with a capacity of 162×2 MW turbine gas generator 94.2V models, two heat recovery steam boiler, with a unit capacity of 160 MW steam unit with ACC cooling system. Ganaveh 484 MW combined cycle power plant have an area of 120 ha and is located 20 km from the port of Ganaveh at the junction of ChaharRustai and Puzgah village.

To identify the challenges of supply chain project, 3 interviews were done in each link in the chain. Table 4 shows the identified challenges of human capital management in the project supply chain.

The strategy for deployment centers of excellence: The results of studies on the role of centers of excellence in increasing efficiency and effectiveness in organizations show that organizing in the form of these centers could lead to an increased likelihood of project success. Therefore, the role of centers of excellence as the repositories of key and technical knowledge seems crucial to the project success (Afshari and Ebtehaj, 2005). Using multi-disciplinary work-force to carry out diverse operations can increase the flexibility of project-based organizations and from a technical perspective, the human resources is a source of capacity. If the human resources have limited skills, no doubt he will be unemployed in different periods of time while if he has enough skills, the like lihood of unemployment would be reduced. One of the features of multi-skilled human resources is job enrichment which facilitates teamwork and help to create better social interaction among team members. On the other hand, training managers and employees is an

Table 5: The evolution of the concept of creating centers of excellence

Variables	Open coding	Concept
Centers of excellence in multinational corporations (Frost *et al.*, 2002)	Centers of excellence is one of the mechanisms by which it can be raised the influence of special packages throughout the organization	Centre of excellence
Centers of excellence in modern organization (Sopori, 2012)	Enjoying and utilizing best practice to help centre of Excellence in the project in order to help increase the success and efficiency of the chain	
Strategic outsourcing: leveraging knowledge capabilities (Quinn,1999)	Devolve chain strategic activities to specialized centers of knowledge	
Maturing to centers of excellence: the next step in it organization	A wide range of centers of excellence in project-based organizations	
Evolution (META Group, 2004)		
Road map to a center of excellence (PM1, 2013)	Roadmap to create the center of excellence in project-driven organizations	
AT andT Project Management Center of Excellence: Communications	Goals expected from centers of excellence in project management	
leader promotes Project Management Leadership (PMI, 2008)		
Effects of human resource management on project effectiveness and success: toward a new conceptual framework (Belout, 1998)	The impact of human capital management on the effectivenessand success of projects	
Factors influencing project success: the impact of human resource Capital management (Belout and Gauvreau,2004)	Factors affecting the success of the project: investigate the effects of Human Management	

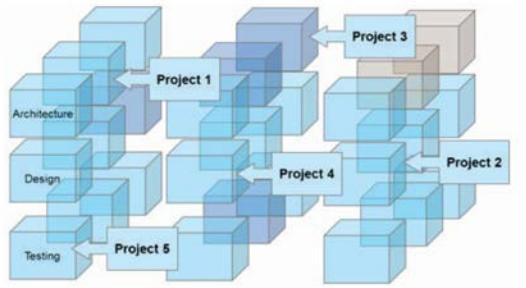

Fig. 3: The traditional model of distributed resources (Sopori, 2012)

appropriate method to create different skills which are necessary for any organization. Employees can play appropriately their role through operational training. One of the important pillars of the work environment should be as a team. In establishing and managing teams, teamwork play an important role in the successful development of a system. Integrated teams have better performance than the teams that are in conflict and have less cohesion. As it is mentioned by Mobin and Roshani (2016), establishment of specialized work teams in the form of centers of excellence can lead to a reduction in the duration of construction projects, as well as enabling organizations to move ahead with projects and the formation of cross-organizational teams is one of the most important factors for project-based organizations. Table 5 shows the evolution of achieving this strategy.

Studies have shown that the traditional approach in project teams suffered from a lack of strategic resource pools or set of skills within the organization. As a result, the quality and stability is dependent on individual skills. In addition, the efforts of retraining and repeat projects and processes in this approach is limited to restrict human capital. Figure 3 illustrated the independent reservoirs of human capital as scattered silos (Sopori, 2012).

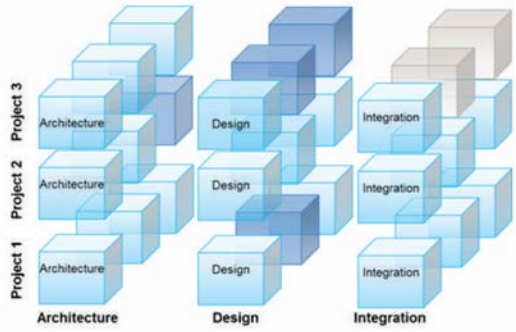

Fig. 4: Centre of excellence model with centralized and service-provider resources (Sopori, 2012)

Compared with the above approach, centers of excellence convert heterogeneous teams into a cohesive and concentrated team and thus, they contribute greatly to the organization. Focused teams offer consistent services to various units of organizations and they eliminate the need for the project to provide experts as a service (received from contractors and outsourced services). The COE centralized resource model that offers services, illustrated in Fig. 4.

Prioritizing the impact of centers of excellence on the challenges of chain management using AHP: At this stage, the impact of centers of excellence on the challenges of chain management is prioritized using AHP. The AHP method and its applications are comprehensively described in (Allahi *et al*., 2015; Mobin *et al*., 2015). To this end, the decision tree of Fig. 5 is used in the first stage.

In the next step, the relationship of each of the strategies and challenges were evaluated in the form of paired comparison matrix and the comments of experts were obtained using a Likert scale (Fig. 6). Accordingly,

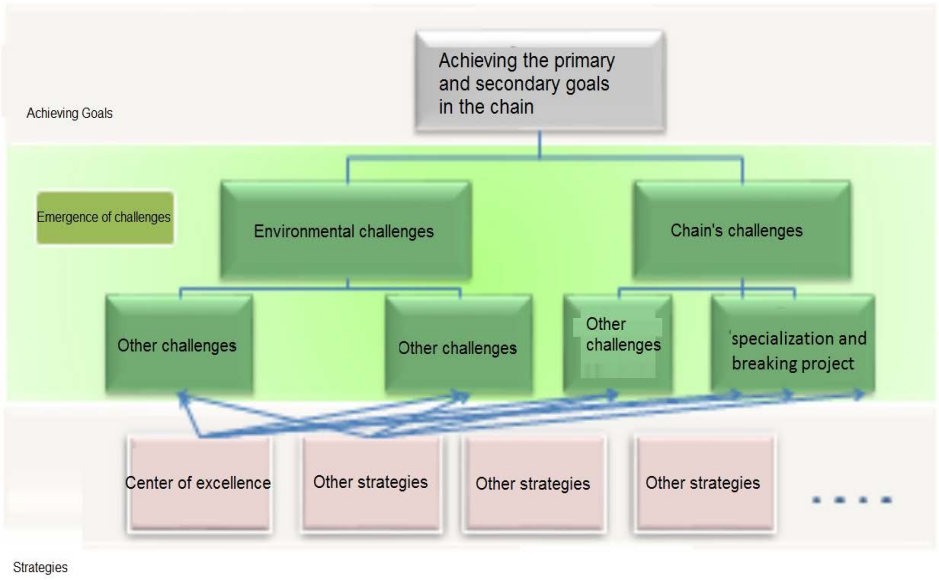

Fig. 5: Decision tree

	Communic	Partnering	Participato	Ring Facin	Standardiz	Postponem	Centralizat	Strategic P	Demand B	COE	Configurati	DFM	SCRM	Sokook
Communication with operator using IT		1.0	1.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	1.0	1.0	3.0	9.0
Partnering & SRM			1.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	1.0	1.0	3.0	9.0
Participatory Design				1.0	1.0	1.0	1.0	3.0	1.0	1.0	1.0	1.0	3.0	9.0
Ring Facing					3.0	3.0	3.0	1.0	3.0	3.0	3.0	3.0	3.0	9.0
Standardization						1.0	1.0	3.0	1.0	1.0	1.0	1.0	3.0	9.0
Postponement							1.0	3.0	1.0	1.0	1.0	1.0	2.0	9.0
Centralization								3.0	1.0	1.0	1.0	1.0	3.0	9.0
Strategic Project Management									3.0	3.0	3.0	3.0	1.0	7.0
Demand Base Supply Chains										1.0	1.0	1.0	3.0	9.0
COE											1.0	1.0	3.0	9.0
Configuration Management												1.0	3.0	9.0
DFM													3.0	9.0
SCRM														9.0

Fig. 6: Paired comparison of strategies in software

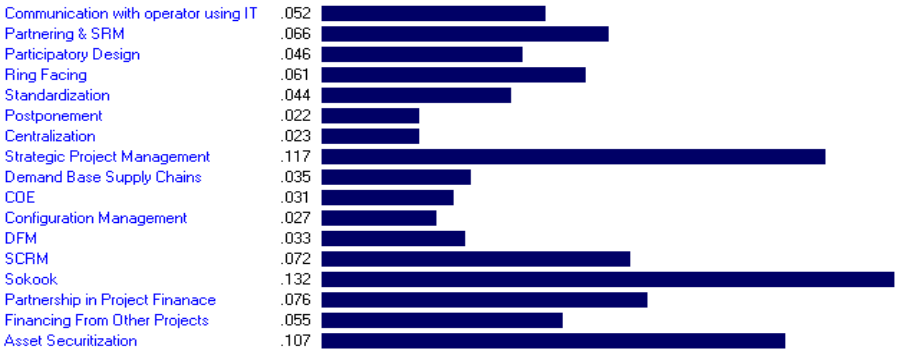

Fig. 7: Strategic priority of centers of excellence in the management of all challenges

the role of centers of excellence in improving public challenges and challenges related to human capital is extracted (Fig. 7 and 8).

The above figure shows that the deployment of centers of excellence in the management of human resources general challenges is extremely important

Ideal mode	Pairwise	Pairwise	Pairwise	Pairwise	Pairwise	Pairwise	Pairwise	Pairwise	Pairwise
Alternative	EnvironmentalChallenges Economic Challenges Financing (L: .637)	EnvironmentalChallenges Economic Challenges Economic Security (L: .258)	EnvironmentalChallenges Economic Challenges Financial Planning (L: .105)	EnvironmentalChallenges Political,Legal and Regulation Government Strategic Challenges (L: .750)	EnvironmentalChallenges Political,Legal and Regulation Legal & Regulationa Challenges (L: .250)	Supply Chain Challenges Strategic Challenges Alignment (L: .650)	Supply Chain Challenges Strategic Challenges Contractual (L: .223)	Supply Chain Challenges Strategic Challenges Specialization (L: .127)	Supply Chain Challenges Financial Challenges SC Financing (L: .750)
☑Communication	.150	.193	.080	.180	.197	.627	.550	.158	.165
☑Partnering & SPM	.125	.157	.080	.144	.143	1.000	.857	.314	.394
☑Participatory	.076	.121	.080	.152	.111	.602	.753	.423	.256
☑Ring Facing	.148	.201	.146	.482	.381	.636	.539	.087	.112
☑Standardization	.225	.290	.075	.164	.127	.200	.161	.406	.299
☑Postponement	.037	.065	.076	.106	.127	.200	.155	.077	.270
☑Centralization	.050	.066	.075	.106	.127	.200	.151	.080	.299
☑Strategic Project	.402	.495	.188	1.000	.598	.960	1.000	.262	.138
☑Demand Base	.100	.083	.075	.095	.127	.378	.559	.203	.246
☑COE	.109	.183	.075	.094	.127	.179	.160	1.000	.111

Fig. 8: Strategic priority of centers of excellence in managing the challenges related to human capital

because its coefficient is equal to (0.031) the coefficient of specialization and breaking the projects is equal to (1).

In this study, we reviewed the strategy of creating centers of excellence in supply chain management at the Power Plant Projects in Southern Iran. Considering a scientific vacuum in providing an integrated approach for assessing and presenting challenges, supply chain management concept model is used. According to this model, the corresponding challenges identified in the supply chain projects in the model were compared with corresponding strategies and according to the specific characteristics of the application of human capital in southern Iran, the effect of creating centers of excellence for managing the supply chain challenges in these projects which mentioned in the model, has been evaluated.

CONCLUSION

The results show that employing this strategy could be effective in managing the challenges associated with the role of human capital in this geographical area of the country. It should be noted that the study was limited by lack of access to information about all construction projects in south of the country and this problem can be solved by developing case studies in future research. In addition to the application of AHP, other MCDM methods such as ANP (Malek *et al*, 2016), TOPSIS (Salmon *et al*., 2015), the combination and comparison of other MCDM approaches, such as COPRAS method (Mobin *et al*., 2015) and also considering fuzzy and grey theories when there are uncertainty in the decision-making process (Mobin *et al*., 2015), can be considered in the future reseach.

REFERENCES

Afshari, H. and M. Ebtehaj, 2008. Evaluating project success factors based on the blowout in MAPNA Group. Proceedings of the International Project Management Conference, January 6, 2008, Tehran -.

Allahi S., A. Vafadarnikjoo and M. Mobin, 2015. An integrated AHP-GIS-MCLP method to locate bank branches. Proceedings of the 2015 Industrial and Systems Engineering Research Conference, 30 May-June 2, 2015, Tennessee, USA. -.

Bazargan, A., 2008. A mixed qualitative research methods and approaches used in behavioral sciences. Didar, Tehran.

Belout, A. and C. Gauvreau, 2004. Factors influencing project success: The impact of human resource management. Int. J. Project Manag., 22: 1-11.

Belout, A., 1998. Effects of human resource management on project effectiveness and success: Toward a new conceptual framework. Int. J. Project Manage., 16: 21-26.

Bredin, K. and J. Soderlund, 2011. Human resource management in project-based organizations: The HR quadriad framework. Palgrave Macmillan, UK., ISBN: 9781137372673, Pages: 238.

Frost, T.S., J.M. Birkinshaw and P.C. Ensign, 2002. Centers of excellence in multinational corporations. Strat. Manage. J., 23: 997-1018.

Keegan, A. and J.R. Turner, 2003. Human Resource Management in Project-based Organization. In: People in Project Management, Turner, J.R. (Ed.), Gower, Aldershot, UK., ISBN-13: 9780566085307, Pages: 179.

Khodadad, H.H. and S. Azizi, 2010. Management and Strategic Planning: A Comprehensive Approach. Saffar Press, Tehran.

Lengnick-Hall, C.A. and M.L. Lengnick-Hall, 1988. Strategic human resources management: A review of the literature and a proposed typology. Acad. Manage. Rev., 13: 454-470.

META. Group, 2004. Maturing to centers of excellence: The next step in it organization evolution. META Group, Inc., Stamford, CT., http://www.msqaa.org/Best_Practices/Miscellaneous/Maturing_to_Centers_of_Excellence.pdf

Mobin, M. and A. Roshani, 2016. An integrated approach for ranking supplier evaluation criteria (case study: A construction project-based company). Proceedings of the 2016 American Society of Engineering Management Conference, June 25, 2016, USA -.

Mobin, M., A. Roshani, M. Saeedpoor and M.M. Mozaffari, 2015. Integrating FAHP with COPRAS-G method for supplier selection (Case study: An Iranian manufacturing company). Proceedings of the American Society for Engineering Management International Annual Conference, October 7-10, 2015, Indianapolis, Indiana, USA., pp: 1-10.

PMI., 2013. A Guide to the Project Management Body of Knowledge: PMBOK Guide. 5th Edn., Project Management Institute, Newtown Square, US., ISBN-13: 9781935589679, Pages: 589.

Pinto, J.K. and D.P. Slevin, 1988. Critical Success Factors in Effective Project Implementation. In: Project Management Handbook, Cleland, D.I. and W.R. King, (Eds.)., 2nd Edn., Van Nostrand Reinhold, New York,.

Quinn, J.B., 1999. Strategic outsourcing: Leveraging knowledge capabilities. Sloan Manage. Rev., 4: 9-21.

Salmon, C., M. Mobin and A. Roshani, 2015. TOPSIS as a method to populate risk matrix axes. Proceedings of the Industrial and Systems Engineering Research Conference, November 22, 2015, Tennessee, USA -.

Sohrabi, A., F. Pourbijan and K. Asayesh, 2015. Comparison analysis of attitude to change in knowledge-based and non-knowledge-based organization. Bull. Georgian Nat. Acad. Sci., 9: 395-399.

Sopori, S., 2012. Centers of excellence in modern organizations. TATA Consultancy Services. http://www.tcs.com/SiteCollectionDocuments/White%20Papers/Consulting_Whitepaper_Centers-of-Excellence-Modern-Organizations_0812-2.pdf

Strauss, A.L. and J. Corbin, 1998. Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory. 2nd Edn., Sage Publication, Thousand Oaks, California, USA., ISBN: 0803959397, pp: 366.

Teimuri, A. and A. Tavousi, 2007. Human resources management in project management. Proceedings of the 3rd International Conference of project management, August 21-24, 2007, Tehran, Iran. -.

Turner, R., M. Huemann and A. Keegan, 2008. Human resource management in the project-oriented organization: Employee well-being and ethical treatment. Int. J. Project Manage., 26: 577-585.