

Investigating the effect of smart fuel system using RFID technology on improving the productivity and career successes in the department of transportation of Gachsaran exploitation of oil and Gas Company

Ghasem Nazari^{1,*}, Dr. Zohreh Aghababaei Dehaghani²

¹MA student of Department Management, Dehaghan Branch, Islamic Azad University, Isfahan, Iran

²Assistant professor of Department Management, Dehaghan Branch, Islamic Azad University, Isfahan, Iran

Abstract: The present study was conducted with the aim of investigating the effects of managers' personality type on career identity of staff based on personality identity of Eysenck Personality Traits model approach (case study is Gachsaran Exploitation of Oil and Gas Company). The research method was a descriptive-correlational one. The population of the study included all official staff working in Gachsaran Exploitation of Oil and Gas Company in 2014 consisting of 3823 individuals and those who worked in the Transportation Department were 400 employees. The sample size was determined to be 342 participants using Morgan's table (Delavar, 2002). Sampling was conducted using Stratified random sampling method. To collect data, Workforce Productivity questionnaires (Hersey & Goldsmith, 1980) and Career Success Development Questionnaire (Ebi and Betz, 2003) were used and their content validity was confirmed by related professors and experts. Their reliability was measured using Cronbach's alpha as 0.898 for Eysenck Personality Questionnaire and 0.871 for Organizational Identity Questionnaire. To analyze the data, statistical methods of Pearson correlation coefficient and SEM path analysis were used. The results indicated that personality types have direct and significant effect on professional identity of staff. In addition, introversion / extraversion distinction, and sensation seeking/emotional stability distinction have direct and significant effect on professional identity of staff. The effect of psychoticism on professional identity of staff is significant but not direct. There is no significant linear correlation between managers' personality type and professional identity and demographic characteristics in different age and gender groups. But, there is a linear and significant correlation of managers' personality type and professional identity with demographic characteristics in different groups with different years of service and educational levels.

Key words: Personality type; Introversion; Extroversion; Sensation seeking/emotional stability; Psychoticism; Professional identity

1. Introduction

In the first decades of the third millennium, human beings are faced with new challenges and opportunities. In the past few years, humanity has attained a high level of development; but, there are many spaces for advancement. Productivity is the cornerstone of economic takeoff and development of countries.

To access career success, regarding the future career objectives and visions, individuals should coordinate their type and degree of human capitals, and to obtain career success, define, manage and measure them (Cho and Yang, 2012).

Productivity has been applied in different cases and levels particularly in relation with economic systems (Tangen, 2002). It is argued that productivity is one of the most important variables affecting economic-productive activities (Sing et al. 2000). Productivity means that to what extent proper acceptable production are obtained from used resources. If more or better goods are produced

using fixed resources, or if the same amount of goods is produced with fewer amounts of resources, productivity increases. By resources, it means all human and physical resources" (Bernolack, 1997).

In the Department of Transportation of Gachsaran Exploitation of Oil and Gas Company, responsible for supporting production, personnel and cargo handling operations, regarding the workload and the necessity of retaining information related to repair costs and the amount of fuel consumption for vehicles, using the paper-based traditional system caused the slowness of doing affairs and delay in doing tasks. Therefore, to facilitate in providing requests and required parts for vehicles, as well as controlling the amount of fuel consumption required by vehicles, machineries, and vehicles hired from other oil companies, this department demanded to use a system for covering its own needs. Furthermore, regarding the successful experience of Iran regarding the implementation of Smart Fuel Card, the decision of implementing a version in smaller, cheaper and more different dimensions was made in this organization in such a way that it can realize all needs of the organization.

* Corresponding Author.

In this line, using RFID technology for running a smart (unique) system for controlling the amount of fuel consumption of vehicles in the company felt necessary.

2. Statement of the problem and significance of the study

Gachsaran Exploitation of Oil and Gas Company is one of the exploitation companies under National Iranian South Oil Company whose operational domain is in Kohgiluyeh and Boyer-Ahmad Province and some parts of it are located in Bushehr, Fars and Khuzestan provinces. Regarding the need felt by the officials of this company for implementing the Smart Fuel Card with RFID technology, this company have been provided the possibility of supervision on supplying and allocating fuel and optimal use of it, saving fuel, and supervising vehicles in transportation fleet and the needs of planets and installations and Machine tools needed to fuel by installing RFID equipment and operationalizing this system in vehicles. By installing equipment of this system in fuel stations of companies and vehicles, by having a central center available online in the network of the company, drivers can put the RFID card on the form of the dices and then transfer the information of their own vehicles to the server. In this stage, the server conducts validation and determine the amount of vehicles' share, and regarding the fact that each vehicle should be visited by technical inspection each month, and then be allowed to be fuelled, in case that it has not refer to technical inspection, it will not be allowed to be fuelled. In this process, each organizational vehicle is allocated an RFID chipset which are available for colleagues with vehicles' keys. By assigning this system, the calculation and representation of the amount of consumption per Km, and also the degree of fuel consumption of vehicles, as well as monthly consumption of fuel of each organizational department are saved in the server. Accordingly, it can be guessed that the implementation of this system in the department can have positive effects on the performance of the staff. Among these effects, one can refer to the effects of valuing productivity in the organization and more successes for the staff.

Furthermore, regarding the fact that fuel stations of Gachsaran Exploitation of Oil and Gas Company (Gachsaran, Bi Bi Hakimeh 1 and 2, and Gureh) have two work shifts, each of which are managed by some operators and multiple vehicles including organizational or hired ones are fuelled in those stations. The mode of providing, calculating and controlling the delivered fuel was conducted by traditional methods and this issue resulted in problems for the organization. Therefore, to eliminate the problems, using mechanized system of RFID seemed necessary. Therefore, the present study investigates the effect of the models of implementation of the Smart Fuel System using RFID technology on improving productivity and career successes due to identifying the importance of

implementing the Smart Fuel System using RFID in the economy of Gachsaran Exploitation of Oil and Gas Company, and obtaining career successes due to reinforcing productivity.

The general objective of the present study is to investigate the effect of implementing the Smart Fuel System using RFID on the productivity and career successes in the Department of Transportation of Gachsaran Exploitation of Oil and Gas Company, and regarding the importance of demographic factors, determining the effect of implementing the Smart Fuel System using RFID on the staff's productivity and career successes in terms of their demographic characteristics, and also comparing the effect of implementing the Smart Fuel System using RFID on the productivity and career successes in terms of the staff's demographic characteristics in the Department of Transportation of Gachsaran Exploitation of Oil and Gas Company.

Conducting this research has significant benefits and effects for transportation department and fueling of vehicles in this department because the performance system of this department is traditional and by mechanizing it, both time and money can be saved. The process of the Department of Transportation in the shape of 80 forms which about 50 forms are circular and the rest are non-circular, and individuals can do affairs without papers and documents are pursued in the least time and without workflow. In addition, by providing complete reports, managers can be effective in relation with evaluation and the way of performance of departments and units regarding the amount of consumed equipment and delivered vehicles and their consumed fuel.

3. Review of literature

Haji Karimi and Farajian (2008) conducted the study titled as "human, social and emotional resources management with an effective approach in career success: a case study of Mellat Bank. The results of the research indicated that the two dimensions of human and social capitals are effective on managers' career success based on path analysis model. At last, some suggestions were presented for managers of the organization.

Nasirzadeh et al. (2008), by conducting the research titled as "a research on the automotive industry" indicated that organizational re-design and career enrichment are effective on improving human resources productivity.

Allahverdi (2009), in a research conducted in Isfahan University of Medical Sciences, indicated that career enrichment, delegating authority to middle levels, reforming employment structures and implementing incentive programs can be effective in increasing the productivity of workforces.

Golparvar and Ghazavi (2010) investigated the role of social supports and organizational policies and measures in career success. The results indicated that 1. Output and input career success has a positive and significant correlation with colleagues'

personal supports, network support and organizational policies and measures. 2. The hierarchical regression analysis predicted the colleagues' personal supports, organizational measures and policies and network supports, input career success, and organizational measures and policies of output career success respectively.

Sanaeyi, Ghazifard, and Sobhanmanesh (2011), in a research investigated the factors affecting the development of Identification Technology via radio frequencies (RFID) in Electronic Supply Chain Management (E-SCM) in Iran Khodro Co. the results of the research showed that the dimension of standard and international features enjoyed the highest weight among other effective dimensions. After that, security, cost, software and hardware infrastructures, technology, and other factors have the highest weights respectively.

Ramazanpour (2012) conducted a research titled as "investigating the role of knowledge-based economy and productivity in career success" and concluded that all elements of knowledge-based economy have a positive correlation with productivity and economic development and the consequences of these relations are reduction in unemployment rate, better quality of products and services, reduction in the total prices, reformation of consumption patterns and in fact, increase in career success.

Ghabezi (2013), in a research titled as "investigating factors affecting the productivity of human capitals in research centers (case study "Oil Industry Research Center") concluded that appropriate leadership, education, payment system, organizational structure, and employment and placement methods are effective on the productivity of human capitals in the center.

Gallagher (2006) in a research titled as investigating the relationship between productivity and career success using supervisors' ideas, attained the positive and significant effect between productivity and career success.

Fatman (2007), in his study titled as "study of relationship between organizational space and managers' productivity" found out that organizational spaces in which decision making is centralized and staff's behavior is under the supervision of a lot of regulations and procedures, productivity, job success, and creativity have reduced and negative attitudes about work group has increased.

Tajima (2007), in a research titled as "the effect of RFID technology on supplying products" indicted that using this technology causes efficacy in the chain and reduction in costs of supplying which in short term results in achieving competitive advantage and in long-term periods of time causes creating long-term competitive advantage.

Maria Vedma and Mihaela Enache (2008), conducted a research titled as "Managing personal human capital for professional excellence". In this research, data were collected from 111 employees in 3 financial institutions in Spain. The results indicated

that knowledge capital, communication capital and emotional capital are factors affecting career success.

Mehmet Tanyas (2009), in a research titled as "the impacts of Radio Frequency Identification (RFID) technology on supply chain costs", investigated the impact of using RFID on costs and performance of supply chain. According to the findings of the research, the positive effect of applying RFID on retailers in the supply chain is more than other members, and this reduction in costs have more advantages for retailers.

3.1. Research hypotheses

3.1.1. Main hypothesis

Implementing the Smart Fuel System using RFID technology is effective on improving productivity and career success in the Department of Transportation of Gachsaran Exploitation of Oil and Gas Company.

3.1.2. Secondary hypotheses

1. Implementing the Smart Fuel System using RFID technology is effective on improving productivity.
2. Implementing the Smart Fuel System using RFID technology is effective on staff's career success.
 - 2.1. Implementing the Smart Fuel System using RFID technology is effective on internal competitions.
 - 2.2. Implementing the Smart Fuel System using RFID technology is effective on external competitions.
 - 2.3. Implementing the Smart Fuel System using RFID technology is effective on staff's job satisfaction.
3. Implementing the Smart Fuel System using RFID technology is effective on improving productivity in terms of demographic characteristics (age, gender, education, and years of service).
4. Implementing the Smart Fuel System using RFID technology is effective on career success in terms of demographic characteristics (age, gender, education, and years of service).

4. Research model

Graph number 1, the model of the present research that shown in Fig.1 (researcher made: adapted from Ramazanpour, 2012).

5. Research method

The present study is an applied on suing a descriptive-correlational method. It is to investigate the effect of implementing the Smart Fuel System using RFID technology on improving productivity and career success in the Department of Transportation of Gachsaran Exploitation of Oil and Gas Company.

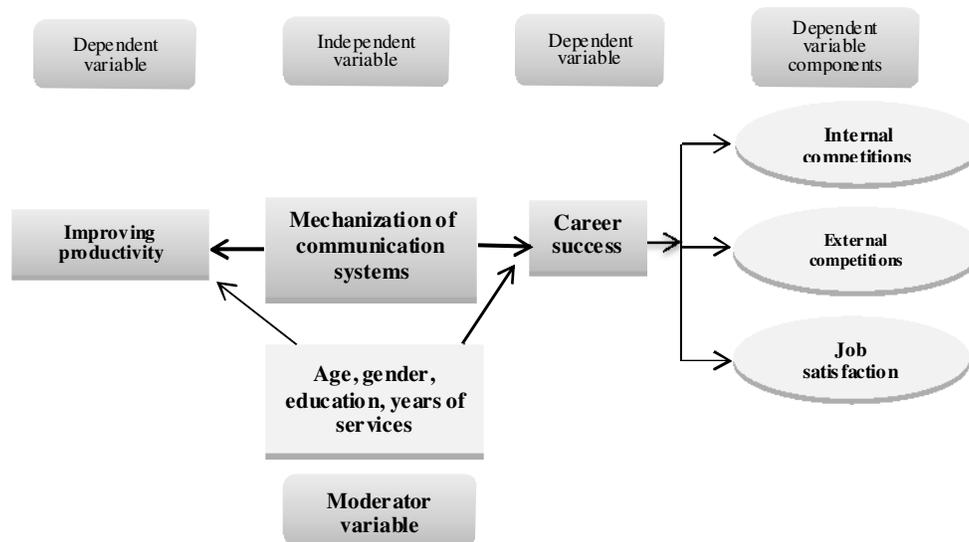


Fig. 1: The model of the present research

5.1. The spatial and temporal scope of the research

The spatial scope of the research is the Department of Transportation of Gachsaran Exploitation of Oil and Gas Company and its temporal scope is from the summer 2014 to the winter 2015.

5.2. Population

The population of the present study includes all employees working in the Department of Transportation of Gachsaran Exploitation of Oil and Gas Company in 2014. After investigations and inquiries from the Department of Administrative Affairs, the number of these employees was 400 individuals.

5.3. Data collection instruments

In the present study, to measure the desired variables, the following questionnaires were used:

- a. Workforce Productivity questionnaires (Hersey & Goldsmith, 1980)
- b. Career Success Development Questionnaire (Ebi and Betz, 2003)

5.4. Descriptive data analysis

The mean scores and SD related to productivity and career success with their components are presented in table 1-4.

6. Inferential findings

6.1. Implementing the Smart Fuel System using RFID technology is effective on improving productivity.

Table 1: Mean scores and SD related to research variables

Variables	Mean	SD
Ability	3.32	0.95
Understanding and identification	3.23	0.88
Organizational support	3.34	0.89
Motivation	3.32	0.88
Feedback	3.27	0.87
Validity	3.19	0.94
Compatibility	3.05	0.91
Productivity	3.25	0.71
Internal competition	3.20	0.80
External competition	3.40	0.88
Job satisfaction	3.35	1.13
Career success	3.32	0.78

Table 2: Frequency distribution in terms of gender

frequency distribution in terms of gender			
Gender	f	Percentage	Percentile
Men	200	100	100
Women	0	0	100
Total	200	100	

Table 3: Frequency distribution in terms of education

frequency distribution in terms of education			
Degree	f	Percentage	Percentile
Diploma	66	33	33
Associate diploma	53	5.26	5.59
BA	79	5.39	99
MA	2	1	100
PhD	0	0	100
Total	200	100	

Table 4: Frequency distribution in terms of years of service

frequency distribution in terms of years of service			
Years of service	f	Percentage	Percentile
Below 5 years	18	9	9
5-10	72	36	45
10-15	63	5.31	5.76
15-20	39	5.19	96
Above 20 years	8	4	100
Total	200	100	-

Table 5: Frequency distribution in terms of age frequency distribution in terms of age

age	f	Percentage	Percentile
20-30	13	5.6	5.6
30-40	33	5.16	23
40-50	86	43	66
Above 50 years old	68	34	100
Total	200	100	-

Regarding the output of table 6 from SPSS, the significance level for t-test is less or equal to 0.05. Therefore, it can be concluded that the null hypothesis is rejected and there is a significant correlation between implementing the Smart Fuel System using RFID technology and improving productivity.

Table 6: The output of SPSS indicating t-test results

Variable	Hypothetical mean	Mean score	T score	df	Sig.	Confirmed hypothesis
The degree of the effect of implementing the Smart Fuel System using RFID technology on improving productivity	3	3.25	4.92	199	0	H0 is rejected and H1 is confirmed

Table 7: The effect of implementing the Smart Fuel System using RFID technology on the components of productivity

Variable	Hypothetical mean	Obtained mean scores	T score	df	Sig.	Confirmed hypothesis
Ability	3	3.32	4.79	199	0	H0 is rejected and H1 is confirmed
Understanding and identification	3	3.23	3.75	199	0	H0 is rejected and H1 is confirmed
Organizational support	3	3.43	5.45	199	0	H0 is rejected and H1 is confirmed
Motivation	3	3.32	5.10	199	0	H0 is rejected and H1 is confirmed
Feedback	3	3.28	4.45	199	0	H0 is rejected and H1 is confirmed
Validity	3	3.19	2.92	199	0.004	H0 is rejected and H1 is confirmed
Compatibility	3	3.05	0.82	199	0.414	H0 is rejected and H1 is confirmed

6.2. Implementing the Smart Fuel System using RFID technology is effective on staff's career success

Regarding the output of Table 8 from SPSS, the significance level for t-test is less or equal to 0.05. Therefore, it can be concluded that the null hypothesis is rejected and there is a significant

correlation between implementing the Smart Fuel System using RFID technology and staff's career success.

6.3. Implementing the Smart Fuel System using RFID technology is effective on internal competitions

Table 8: The output of SPSS indicating t-test results

Variable	Hypothetical mean	Mean score	T score	df	Sig.	Confirmed hypothesis
The degree of the effect of implementing the Smart Fuel System using RFID technology on staff's career success	3	3.31	5.75	199	0	H0 is rejected and H1 is confirmed

Table 9: The output of SPSS indicating t-test results

Variable	Hypothetical mean	Mean score	T score	df	Sig.	Confirmed hypothesis
The degree of the effect of implementing the Smart Fuel System using RFID technology on internal competitions	3	3.20	3.59	199	0	H0 is rejected and H1 is confirmed

Regarding the output of Table 9 from SPSS, the significance level for t-test is less or equal to 0.05. Therefore, it can be concluded that the null hypothesis is rejected and there is a significant correlation between implementing the Smart Fuel System using RFID technology and internal competitions.

6.4. Implementing the Smart Fuel System using RFID technology is effective on external competitions.

Table 10: The output of SPSS indicating t-test results

Variable	Hypothetical mean	Mean score	T score	df	Sig.	Confirmed hypothesis
The degree of the effect of implementing the Smart Fuel System using RFID technology on external competitions	3	3.40	6.47	199	0	H0 is rejected and H1 is confirmed

Regarding the output of table 10 from SPSS, the significance level for t-test is less or equal to 0.05. Therefore, it can be concluded that the null hypothesis is rejected and there is a significant correlation between implementing the Smart Fuel

System using RFID technology and external competitions. Implementing the Smart Fuel System using RFID technology is effective on staff's job satisfaction.

Table 11: The output of SPSS indicating t-test results

Variable	Hypothetical mean	Mean score	T score	df	Sig.	Confirmed hypothesis
The degree of the effect of implementing the Smart Fuel System using RFID technology on staff's job satisfaction	3	3.34	4.36	199	0	H0 is rejected and H1 is confirmed

Regarding the output of table 10 from SPSS, the significance level for t-test is less or equal to 0.05. Therefore, it can be concluded that the null hypothesis is rejected and there is a significant correlation between implementing the Smart Fuel System using RFID technology and staff's job satisfaction.

productivity in terms of demographic characteristics (age, gender, education, and years of service)

Since the all participants of the study were men, the factor gender was excluded from the study. To investigate each of the above factors, the variance analysis test was sued.

6.5. Implementing the Smart Fuel System using RFID technology is effective on improving

Table 12: Variance analysis of improving productivity

Factors		Sum of Squares	df	Mean Square	F	Sig.
The degree of effect on age groups	Inter-group	2.178	4	0.545	1.072	0.371
	Intra-group	99.007	195	0.508		
	Total	101.185	199			
The degree of effect on education groups	Inter-group	1.499	4	0.375	0.733	0.571
	Intra-group	99.686	195	0.511		
	Total	101.185	199			
The degree of effect on years of service groups	Inter-group	1.525	4	0.381	0.746	0.562
	Intra-group	99.660	195	0.511		
	Total	101.185	199			

Regarding the significance level for the three tests, it can be concluded that in each three tests, the null hypothesis is not rejected because the sig. in these three factors is higher than 0.05. This case of not rejecting the null hypothesis means that the degree of influencing implementing the Smart Fuel System using RFID technology on improving productivity does not depend on demographic

characteristics (age, education, and years of service) and there is no significant difference among different levels of these three demographic factors. Implementing the Smart Fuel System using RFID technology is effective on career success in terms of demographic characteristics (age, gender, education, and years of service).

Table 13: Variance analysis of career success

Factors		Sum of Squares	df	Mean Square	F	Sig.
The degree of effect on age groups	Inter-group	3.912	4	0.978	1.623	0.170
	Intra-group	117.486	195	0.602		
	Total	121.398	199			
The degree of effect on education groups	Inter-group	1.551	4	0.388	0.631	0.641
	Intra-group	119.847	195	0.615		
	Total	121.398	199			
The degree of effect on years of service groups	Inter-group	14.592	4	3.648	6.660	0
	Intra-group	106.806	195	0.548		
	Total	398.121	199			

Regarding the significance level for the three tests, it can be concluded that in each three tests, the null hypothesis is not rejected because the sig. in these three factors is higher than 0.05. But, in the factor years of service, the sig. is less than 0.05. therefore, the null hypothesis of this test is rejected which means that the degree of the effect of implementing the Smart Fuel System using RFID technology on career success depends on years of service.

Table 14: The degree of the effect of implementing the Smart Fuel System using RFID technology on career success in different levels of years of service

Years of service	Mean
Below 5 years	3.18
5-10	3.46
10-15	3.28
15-20	2.96
Above 20 years	4.30
Total	3.31

The Table 14 indicates the degree of the effect of implementing the Smart Fuel System using RFID technology on career success in different levels of years of service. In fact, this table indicate that individuals who have services above 20 years are believe in the effect of implementing the Smart Fuel System using RFID technology on career success than other groups

7. Conclusion

Using Radio Frequency Identification (RFID) with increasing development of this technology and its penetration in different systems seems an inevitable issue. This technology has provided much more extensive facilities than other similar technologies. Among them, one can refer to the facilities obtained by combining it with other technologies. The possibility of using this non-contact device in electronic payments is one of its advantages. This issue provides the possibility of designing labels as the smart fuel cards; as a result, other than supplying the performance of the smart fuel card and reports related to it (creating information bank of fuel consumption of vehicles, creating a mechanized system of selling oil products in fuel stations, acculturation in applying IT and E-commerce among people, the possibility of paying money for fuel in stations via smart cards) it has the ability of preparing other reports including the degree of fuel consumption based on the distance traveled and paying costs related to vehicles such as toll roads and parking lots, automatic polishing of traffic violations, and etc.

In addition, the RFID system, using its own capabilities in paying toll roads, controlling speed, preventing theft and automobile tracking, and mechanizing activities can cause the reduction in costs and improvement of services. Further, it can improve the quality and flexibility by increasing

speed and accuracy, reducing the response time, and decreasing reworking.

8. Research suggestions

In service educational courses regarding implementation of the Smart Fuel System should be placed on the agenda of educational programs which regarding the existence of such a relationship between implementation of the system and improving productivity, this issue causes the increase in organizational productivity.

It is suggested to managers that they should allocate necessary equipment required by the job and sufficient budget for different departments of the organization regarding implementing the Smart Fuel System in order that they can have needed supports from staff because the increase in organizational support causes increase in staff's productivity.

Regarding the fact that compatibility is one of the components of improving productivity in organizations, managers are suggested that concerning beliefs and attitudes, wages and benefits, and staff's capabilities with the conditions of their current jobs, the degree of compatibility of the employees' with their jobs be increased and accordingly, they can be assisted in improving organizational productivity.

All data of the present study is based on employees' self-report. Therefore, designing studies whose data are based on more accurate evidence can provide firmer results for designing interventions.

Conducting similar studies in other departments of Gachsaran Exploitation of Oil and Gas Company and comparing them with other similar organizations in Iran and other countries.

References

- Allahverdi, M. et al. (2009). Human resources productivity from the perspective of middle managers of Isfahan University of Medical Sciences. *Journal of Hospital*. No. 11.
- Foong, K. & Yorston. R. (2003). *Human Capital Measurement and Reporting: A British Perspective*, London: London Business School.
- Gattiker, U. and Larwood, L. (1998). "Predictors for managers' career mobility, success, and satisfaction", *Human Relations*, Vol. 41 No. 8, pp. 569-91.
- Ghabezi, R. (2013). Investigating factors affecting the productivity of human capitals in research centers (case study "Oil Industry Research Center"). *Bi-quarterly of Innovation and Value-building*. First year. No. 3. Spring and summer.
- Gratton L and Ghoshal S (2003) *Managing personal human capital: new ethos for the "volunteer"*

- employee. *European Management Journal* 21 (1). 1-10.
- Guo, Wenchen Xiao, Hongjun & Yang, Xi. (2012). An Empirical Research on the Correlation between Human Capital and Career Success of Knowledge Workers in Enterprise. Faculty of Management and Economics, Dalian University of Technology. Dalian, 116023, China. *Physics Procedia* 25 (2012) 715 - 725.
- Morehead, G. (2006). An introduction to organizational behavior. S. M. Alvani et al. (Trans.). Tehran: Morvarid.
- Najaf Beigi, R. (2006). Organization and Management. Tehran: Research Deputy of Islamic Azad University. 102-107.
- Ramazanpour, E. Ayagh, Z. and Chehreh, M. (2012). Investigating the role of knowledge-based economy and productivity in career success. Proceedings of the National Conference to examine and explain the strength of the resistive economy. 7 March. Guilan University.
- Sanayei, A. et al. (2011). The factors affecting the development of Identification Technology via radio frequencies (RFID) in Electronic Supply Chain Management (E-SCM) in Iran Khodro Co. *Journal of Modern Marketing*. Spring. Vol. 1. No. 1. 41-70.
- Tangen S (2005). Demystifying Productivity and Performance. *International Journal of Productivity and Performance Management*; 53 (8):726.
- Weiss HM (2002). Deconstructing job satisfaction separating evaluations, beliefs and affective experiences. *Human Resource Management Review*. 12 (2): 173-194.
- Yang, Seung-Bum and Choi, Sang (2009) Team Performance Management, 15/5, pp. 289 301, "Employee Empowerment and Team Performance".