Research Journal of Recent Sciences ____ ISSN 2277-2502
Vol. **3(3),** 12-22, March **(2014)** *Res.J.Recent Sci.*

Analysis of Different HRM Policies Effect on Organization Knowledge Level

Izadi Ahmadreza[1], Ebraze Ali[2*] and Afshar kazemi Mohammadali[3]
[1]Department of Health, Islamic Azad University, Sharekord Branch, Shahrekord, IRAN
[2]Department of Health, Qom University of Medical Science, Qom, IRAN
[3]Department of Industrial Management, Tehran markaz Branch, Islamic Azad University, Tehran, IRAN

Available online at: www.isca.in, www.isca.me
Received 25th May 2013, revised 1st July 2013, accepted 20th August 2013

Abstract

The purpose of this paper is to analyze the effect of HRM policies on total effective knowledge in a healthcare organization as essential requirement for survival. The research methodology is in accordance with the principles of System Dynamics. In the first phase, in this adaptive and descriptive research, the data collection started in the wake of reviewing related literature when a series of semi-structured interviews were conducted with hospital managers to determine their perceptions about the HRM policies in an Iranian hospital. Then, casual loop diagrams, and stock and flow diagrams were identified. Model equations were determined by integral equation related to system dynamics. Model validity was checked by structural test, consistency test, extreme condition test, and parameters analysis. Parameters analysis was done with historical fitness between simulated data and actual data for total employee variable behavior by coefficient of determination, mean square error (MSE), bias component of MSE, variation component of MSE, and covariance component of MSE. Vensim software was used for simulation, sensitivity and policy analysis. TEK and average knowledge per person increase in the simulation with a non-linear pattern. Different policies in human resource management could affect the TEK by change in hiring rate, on the job training rate, quit rate, and decay rate. According to the results, stop of current adopted policy based on hiring contract employees from 2010 and hiring them as long term hiring had a better effect on TEK and average knowledge. To facilitate meaningful research in this area, it is important that researchers critically consider the nature of the concept of service experience in terms of who experiences it, the scope, content, and context of the service experience, and how service experience relates to other concepts, such as value. No analysis of different HRM policies on organization knowledge level in the healthcare organizations has previously been undertaken.

Keywords: Human resources management, knowledge management, hospital, system dynamics, Iran.

Introduction

Four sources of power are knowledge, resources, decision making and networks[1]. Three of these sources are in essence of human resource management (HRM). This paper reports on the findings of research that provides insights into how HRM policies affect the organizational knowledge level or organizational experience. Although, HRM and Knowledge management (KM) are two sides of a coin, but the relationship between them and effect of managerial policies on KM have been less studied[2]. In this paper, we therefore pose the question: how do HRM policies affect the organizational knowledge? In answering this question, the paper uses system dynamics methodology to determine structure of managers' decision making in an Iranian hospital.

System Dynamics is a powerful tool that gives a systematic approach to conceptualizing the problem, building a dynamic model and running simulations to identify the critical parameters which need closer control to enhance the efficiency and effectiveness of the organization. In this paper, System Dynamics approach has been used to study HRM policies in order to analyze its effect on organizational knowledge level.

Human resource management: HRM deals with the design of formal systems in an organization to ensure the effective and efficient use of human talent to accomplish organizational goals. In an organization, the management of human resources means that they must be recruited, compensated, trained, and developed[3]. Human resources are defined as the efforts, knowledge, capabilities and committed behavior of people in the organization[4-6]. Also, Management of human resource has been defined as the mobilization, motivation, development and deployment of human beings in and through work[7]. HRM is a strategic player to achieve the objective of continuous quality improvement[4], competitive advantages and organizational existence[8].

Studies have demonstrated that specific HR practices, which include skills, knowledge and abilities can enhance human capital, especially in the management of knowledge workers in the health service sector[9]. It has also been demonstrated that health service firms use a range of strategic HRM practices to manage their knowledge workers and that these practices (including personnel control oriented HR practices such as staffing and training practices) lead to increased organizational performance[10]. The human resources need to be treated with great care and human resource issues require special attention of decision makers at the strategic level[4]. Development of strategic leadership and management capabilities within modern organizations has been very important "in meeting the challenge of working effectively to promote not only economic, but also sustainable development". This is an area where a linkage between KM and HRM may prove to be effective[11]. From an HRM perspective, a number of things have to happen. Strategic HRM can help to support sustainability through the identification of capabilities specific to sustainability and by seeking to align recruitment and selection practices to these capabilities[11]. In brief, we believe that human resources are the biggest asset in any organization[12].

In the context of health service, human resources include all the necessary human ability, skills, competencies and knowledge required to deliver clinical care[4]. A large proportion (around 50%) of employees in healthcare organizations are professionally qualified staff. A combination of rapid expansion, high staff turnover and an increasingly ageing workforce has contributed to significant projected staff shortfalls of registered professionals and other skilled staff in many countries[1]. Health services sector employs many highly educated and skilled knowledge workers, frequently educated to doctoral level, who represent extensive human resources. How the return on these resources might best be achieved is an issue of ongoing concern to the sector[6,7]. Although several studies find a positive relation between certain HRM policies and organizational knowledge, literature and most empirical evidence alike do not explain or provide sounding evidence about managerial roles in optimizing knowledge or experience in their organization. However, there is a gap explaining how HRM policies contribute to the creation and improvement of knowledge. The healthcare industry is increasingly becoming a knowledge-based community that depends critically on knowledge management (KM) activities to improve the quality of care[12,13].

Dynamic nature of the employee–organization relationship makes the human resource management a challenging task. Human resource policies and practices result from a dynamic process, which evolves through negotiations, decision-making and review process. Managers have an essential role to play in the effective management of human resources. They decide to hire, quit or retire the employees. In addition their decisions affect turnover of people in and from the organization. Their decisions affect everyone in the organization. In fact, an HRM system can lead to a sustained competitive advantage through the creation of knowledge stocks at individual level[4].

Knowledge and Knowledge Management: It is a well-known phrase that knowledge is power and one of the few bases of sustainable competitive advantage[14]. Knowledge power refers to having information about the strategy and direction of an organization. Application of knowledge through doing something different defined as learning[1]. Learning refers to knowledge in motion[14].

The question of the nature of knowledge is extremely challenging. As Martensson explained, some challenges concern the fact that knowledge cannot easily be stored. Moreover, Knowledge is something that resides in people's minds rather than in computers. Unlike raw material, knowledge usually is not coded, audited, inventoried, and stacked in a warehouse for employees to use as needed. It is scattered, messy, and easy to lose. Organizational knowledge is very complex and has multiple dimensions. Knowledge is a high-value form of information that is ready to be applied to decisions and actions that it could be divided to both tacit and explicit knowledge[15].

Furthermore, knowledge was defined in terms of 12 qualities: knowledge is messy; it is self-organizing; it seeks community; it travels on language; it is slippery; it likes looseness; it experiments; it does not grow forever; it is a social phenomenon; it evolves organically; it is multi-modal; and it is multi-dimensional[15].

Definitions of knowledge show even greater disparities and KM is a young and still fast developing discipline having its roots in many sciences[15]. KM involves any systematic activity related to the capturing and sharing of knowledge by the organization.

The concept of knowledge embodies a variety of different categories of skills, know-how, experiences, beliefs, and capacities. In this research, knowledge is defined as information combined with experience, context, interpretation, reflection, and perspective[15] that adds a new level of insight[15]. Experience is defined as the accumulation of knowledge associated with direct interaction with some object, process, or system in the world[14]. Martensson explains that knowledge becomes meaningful when it is seen in the larger context of our culture, which evolves out of our beliefs and philosophy[15]. This definition, while focusing on the expertise that is at the heart of knowledge work, also captures the intricacies of the relationship between knowledge workers and their employing organizations. Experience can aid in understanding the broader context of issues, seeing how new knowledge can be integrated into existing knowledge, and assigning value to different types of knowledge. Experiences involve practical contact and acquired knowledge or skills. From this view, we put emphasis on tacit rather than explicit knowledge. Tacit knowledge requires experience to be understood and consider especially valuable. This view is similar to the commodity view of knowledge that defining as a managerial approach to knowledge, where knowledge is understood as an organizational resource, as a commodity. From these statements it is obvious that Davenport and Prusak view ‘‘knowledge’’ as an asset that could be exported and imported, and managed[16].

Knowledge is a multifaceted, dynamic, and multidimensional concept[14]. Traditionally KM can be viewed as one of the least scientific approaches with an absence of proper methodologies for assessment, application or implementation. KM needs a systematic approach to develop capabilities which accelerate the evolution of knowledge into a key organizational resource[15].

Burk contends ‘‘knowledge management is 80 percent people and 20 percent technology’’. Continuous dialogues between employees create organizational knowledge. Knowledge gained by employees through learning or training will enable them to translate their knowledge into organizations’ routine, competencies, job descriptions and business processes, plans, strategies and cultures. Employees should be given constant training to improve their knowledge and capabilities. Therefore, it is important for the organization to have a proper training program to enable employees gain knowledge and contribute to the creation and transfer of knowledge in the organization[12].

Human interaction and how it occurs is central to knowledge creation and transfer[11-12,14]. The HRM policies must play a critical role in creating, applying, sharing and preserving the organizational knowledge required to ensure a competitive position[12].

Measurement of knowledge is still in the growing stage. Some researchers attempt to classify knowledge measurement methods but the roles of HRM policies are disregarded. Managerial efficacy through intervention can be increased by learning the principles of dynamic knowledge and managers need to know that they are managing the company’s knowledge so that it maximizes returns to the organization. Simulation technology can enhance knowledge flows in addition to workflows[14]. Therefore, organizations need to understand the dynamics of their knowledge capital and knowledge acquisition policy[17]. On the other hand, policy-makers have a long way to find effective solutions to tackle the impending shortage of workforce in decades to follow[18].

Simulation: Simulation represents a different class of IT, one that facilitates learning as well as doing through virtual practice. Computational modeling is useful for knowing and learning about organizational knowing and learning[14,19-20]. System Dynamics (SD) is used for modeling and simulating dynamically complex issues and analyzing their resulting non-linear behaviors over time in order to develop and test effectiveness and robustness of structural policies[21].

Human resources management must play a critical role in creating and engaging the critical knowledge[12]. This point of view can be interesting for HRM and KM researchers as well as HR managers because HRM policies make employees more valuable and unique. Managing knowledge level results in a dynamic process[16].

Knowledge flows are dynamic. Employees are central to knowledge flows and knowledge cannot be managed without managing people[14]. Knowledge as a stock is accepted by most authors[6,13,14]. A knowledge stock is defined as a concept to characterize the level of knowledge accumulated by a person or organization. Knowledge flows and knowledge stocks interrelate tightly and dynamically[14]. Knowledge dynamics is about the study of how knowledge moves with respect to time. There may be material delays and information delays. Both types assume that there is at least one stock within every delay. The dynamic assumptions and the feedback loops should imply that it will be possible to reach a steady-state solution[22]. System dynamics is a perspective and a set of conceptual tools that enables us to understand the structure and dynamics of complex systems. It is also a rigorous modeling method that enables us to build formal computer simulations of complex systems and use them to design more effective policies and organizations. System dynamics is built upon system thinking, i.e. the ability to see the world as a complex system, in which we understand that ‘‘you can’t just do one thing’’ without thinking that everything is connected to everything else[21-22].

Over the last decade, several top companies, governmental organizations, and consulting firms have used system dynamics to address critical issues and decisions. Examples and applications include diffusion of technologies, business cycles, the use and reliability of forecasts, service quality management, etc[22].

On-the-job training increases knowledge level. It is related to direct experience with some work task, activity or process, generally with the implication that some kind of experience-based learning is taking place[14]. Finally, the key to maximizing the contribution of KM to established management policies such as HRM is to promote awareness and understanding concerning the implications of the essential, deep-seated and often obscure differences in approaches to KM. This requires an understanding of deeper underlying values and assumptions, coupled with an appropriate alignment between KM and HRM[11]. Use of system dynamics methodology in KM is studied in several researches[13,17,18,23-25].

This paper examines the role of HRM policies in implementing and maintaining knowledge management, and investigates what the organization should do to ensure the development of its knowledge level. The issue to be analyzed in this article: How can HRM policies are involved in the successful management of knowledge? In this study, the effects of HRM policies on the knowledge management (KM) in the healthcare industry were examined. The question of whether HRM policies affect knowledge management cycle in a healthcare organization where expert knowledge is deemed as obligatory requirement for survival was address.

Several problems faced by this hospital are employee turnover, reduction in customer satisfaction levels, and lack of productivity. When experienced workers leave the team, they take with them the knowledge that was acquired in their activities. They are replaced with new workers that reduce overall performance. This occurs since these new workers will usually be slower in their activities and will require more help from the experienced colleagues until they leverage their knowledge.

Methodology

The research methodology is in accordance with the principles of System Dynamics. This includes: problem identification, system conceptualization, model formulation, simulation and validation, and policy analysis and improvement[26]. The problem identification stage involves the identification of variables which have influence on the knowledge level. In the first phase, in this adaptive and descriptive research, the data collection started in the wake of reviewing related literature when a series of semi-structured interviews were conducted between hospital managers to determine their perceptions about the HRM policies in the Fatemeh Al-Zahra hospital. The hospital is affiliated to Iranian Social Security Organization (ISSO). In addition, the managers in the medical deputy of ISSO were also interviewed. Then, casual loop diagrams, and stock and flow diagrams were identified. Doctors' casual loop diagrams were separated from other employees. The two-level promotion chain for new and experienced employee was designed. Model equations were determined by integral equation related to system dynamics. According to Sterman[21], calculation of knowledge was done by:
Average Knowledge = Total Effective Knowledge Labor Force

Total Effective Knowledge = INTEGRAL (Increase in Knowledge from Hiring + Increase in On-the-Job Knowledge - Loss of Knowledge from Attrition - Knowledge Decay Rate, Total Effective Knowledge (t))
Increase in Knowledge from Hiring =Average Knowledge of New Hires * Hiring
Loss of Knowledge from Attrition = Average Knowledge * Attrition
Increase in on-the-Job Knowledge = Labor Force * Weeks Worked per Year
Knowledge Decay Rate = Labor Force * Average Knowledge * Fractional Knowledge Decay Rate

The average and total effective knowledge was measured with a coflow structure. The stock TEK (measured in person-weeks) is the effective number of weeks of service each employee has, summed over all employees. Each employee hired brings a certain amount of effective knowledge. Each employee accumulates additional knowledge at the rate of 1 week per week worked. The unit of time for the simulation is the year, and average experience is measured in weeks. The increase in TEK is the number of weeks each person works per year summed over the total employees.

Model validity was checked by structural test, consistency test, extreme condition test, and parameters analysis. Parameters were analyzed with historical fitness between simulated data and actual data for total employee variable behavior by coefficient of determination, mean square error (MSE), bias component of MSE, variation component of MSE, and covariance component of MSE. Total doctors' variable behavior is optimized by Vensim optimization. Vensim software was used for simulation.

Results and Discussion

Casual loop diagrams: In this section, casual loop diagrams are described based on the research finding that are shown in figure 1. Human resources should be hired in the hospital based on the gap between desired employee and actual employee. The hospital should request employee based on shortage from deputy of ISSO. The process has a time lag or delay. New employee numbers Increase with hiring new employees. Increasing new employee numbers would increase the total number of employees. Increase the total number of employees would reduce the gap between desired employee and actual employee. Hiring loop in figure 1 illustrates this negative feedback loop. New employees as shown on experiencing loop, with a delay time lead to increase in experience employees that lead to an increase in the total number of employees. Increase in total of employees would reduce the gap between desired employee and actual employee. Increase in new and experience employees would rise the quit and turnover of employees. These feedback loops are shown as quit loop and turnover loop.

Because of the delay in hiring new employee and as a response to hospital pressures to ISSO for employee shortage, a new policy was approved by ISSO. In the new policy, each hospital has allowed to hire new contract employees based on the average overtime of current employees. New contract employees are temporary employees that are hired for few months. Their loops are shown in figure 1 as hiring contract employees.

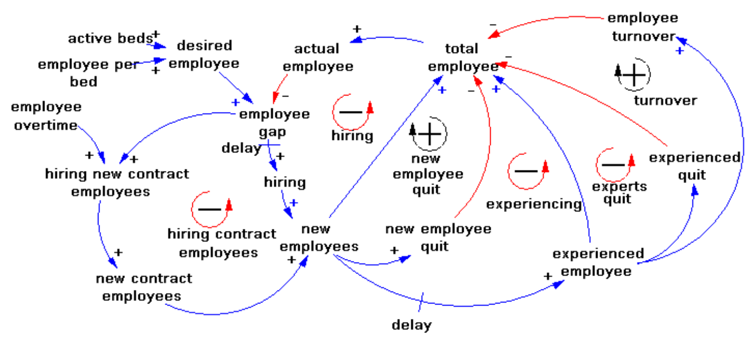


Figure-1
Employees hiring and quit casual loop diagrams in the case hospital

In the research, casual loop diagrams of doctors were separated from other human resources. Because of the similarities between casual loops of them, these loops are shown in figure 2.

Hiring new employees and physicians lead to increase in knowledge entrance to the hospital that increases the total effective knowledge (TEK). In addition, increase in total employees and physicians leads to increase in on-the-job training and then increase in TEK. Increase in TEK leads to increase in the average knowledge. Effective knowledge, on the other hand, decays as employees forget relevant knowledge and as changes in the production process render experience obsolete. Increase in total employees and average knowledge decrease the TEK. Additionally, Increase in total employees and average leads to increase in decay of knowledge and then it decreases the TEK. Finally, the TEK level will be raised by on-the-job training. The model casual relations are shown in figure 2.

In this causal diagram, there are four positive feedbacks and eight negative feedbacks that have casual relationship with TEK and average knowledge per person in the hospital. This causal diagram shows a fundamental structure to understand dynamics of HRM and KM in the hospital.

Stock and flow diagrams: Stock and flow diagrams (SFD) as a computable dynamic structure are constructed from causal loop diagrams. In the SFD of the model, new employees, experienced employees, contracted (temporary) employees, new doctors, experienced doctors and TEK are defined as a stock or level variable that take on its value as a consequence of accumulation and de-accumulation and are not determined as a direct mathematical function of some other variable.

The new employee's variable is the accumulation/de-accumulation of hiring and quit or experiencing. The variable hiring is accumulating by dividing employee gap by adjustment time to hire. The new employee's quit variable is determined by new employees multiplied by new employee quit fraction. Additionally, the variable is de-accumulated by dividing new employee by employee experiencing time. In contrast, the experienced employee is accumulated by dividing new employee by employee’s experiencing time and it is de-accumulated by dividing experienced employee by employee turnover time or experienced employee multiplied by experienced employee quit fraction. The SFD of doctors’ sub-structure was calculated as the same as employees’ sub-structure. The full coupling of these sub-structures can be seen graphically in figure 3.

The temporary employee was defined as a separated level variable. It is accumulated by dividing desired temporary employee by time to temporary employee hire.

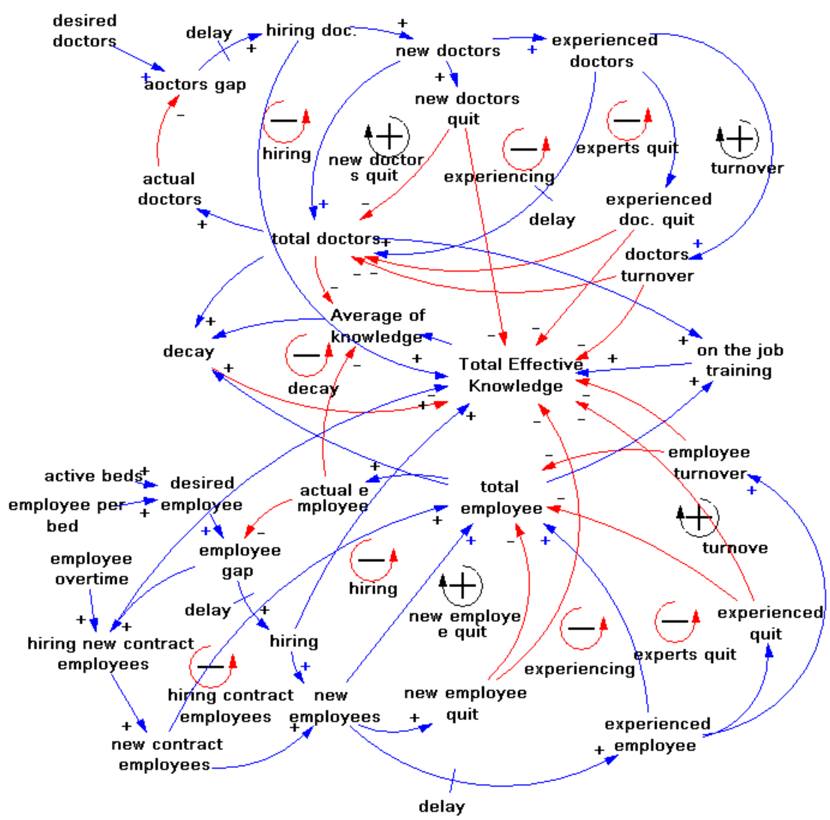


Figure-2
HRM and KM casual loop diagrams in the case hospital

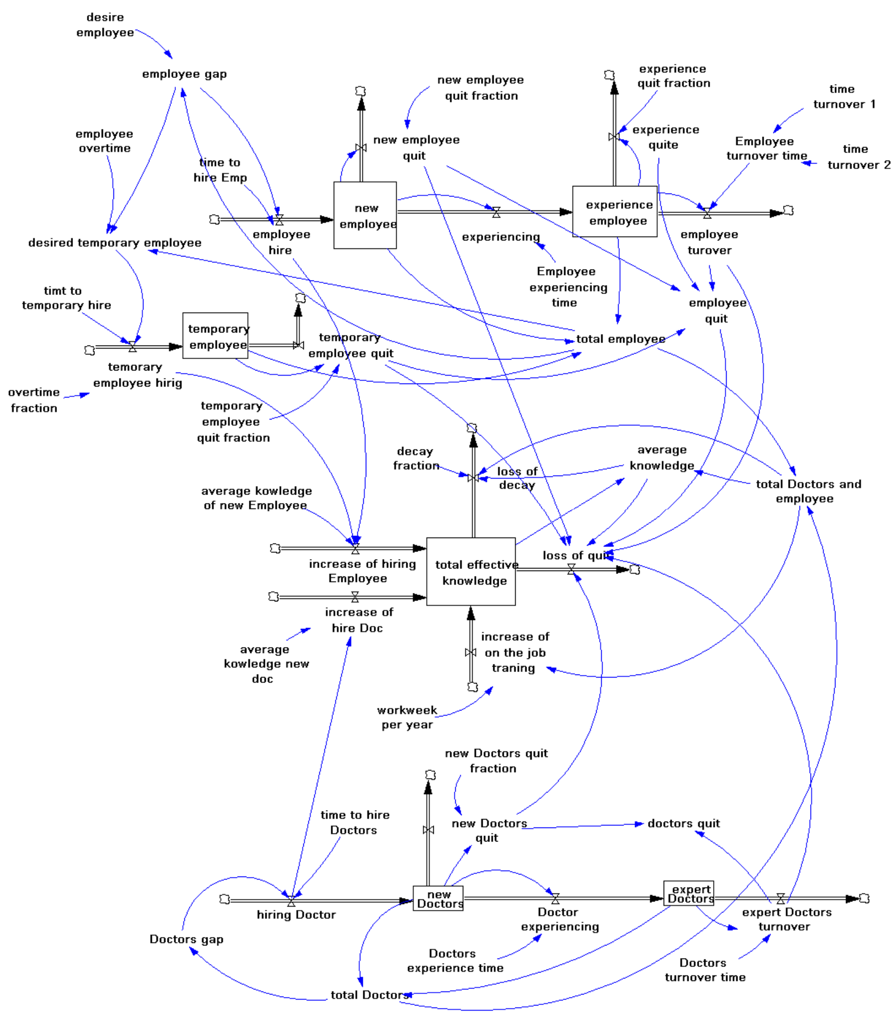


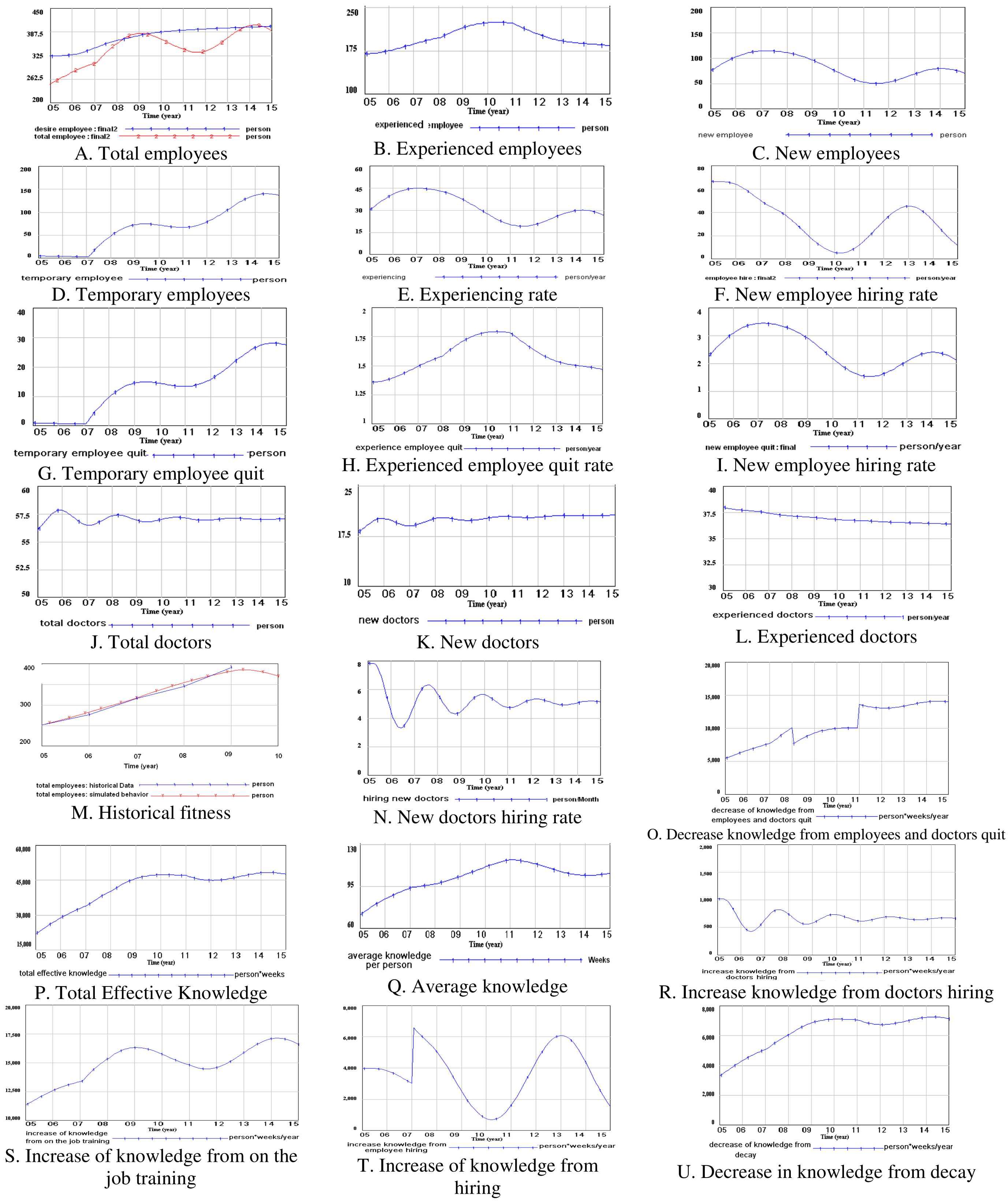
Figure-3
HRM and KM stock and flow diagrams in the case hospital

Base Case Behavior: According to the research findings, total employees increased from 250 persons in 2005 to 383 in 2009, but the stock decreased to 334 in 2011 and afterward will increase into 404 persons in 2015. The result of simulation and the model behavior is shown in part A of figure 4. The number of experienced employees that was 170 prior to simulation reached to 224 in time 10 then it decreased to 183 in the 10th year of simulation. The number of new employee that was 170 prior to simulation reached to 114 in time 07. Then, it decreased to fifty people in time 11 and rose to 80 in the end. The number of doctors was 56 in the beginning of simulation and with some oscillation reached to 57 in the end.

Temporary employment policy was implemented in 3rd year of simulation. Before that time, temporary employee stock had been zero. Hiring temporary employees led to an increase in the stock from time 03. The policy also led to a decrease in employee experiencing rate and experienced employee stock. Employee's experiencing rate rose from 30 persons per year to 45 in time 07 and then fell to 26 persons per year in the final phase of simulation. On the other hand, the decrease in new employee resulted from the policy.

Total effective knowledge (TEK) in the case hospital was raised from 21753 units (person*weeks) in time 05 to 47333 units in the 5th year of simulation. The rise is related to the increase of total employees and on-the-job training. Then it, with a relative reduction, reached to 45023 in time 11 and came back to 47700 in the end of simulation. Average knowledge at the outset was calculated 71 weeks. It rose to 114 weeks in time 11 and then reduced to 105 weeks at the end.

Historical fitness between simulated data and actual data for total employee variable behavior showed that coefficient of determination (R^2) was calculated 0.98632, mean square error (MSE) 0.01517, bias component of MSE 0.05732, variation component of MSE 0.0122, and covariance component of MSE 0.82067. According to optimization results for Total doctors' variable behavior, it is optimized by Vensim optimization.



A. Total employees
B. Experienced employees
C. New employees
D. Temporary employees
E. Experiencing rate
F. New employee hiring rate
G. Temporary employee quit
H. Experienced employee quit rate
I. New employee hiring rate
J. Total doctors
K. New doctors
L. Experienced doctors
M. Historical fitness
N. New doctors hiring rate
O. Decrease knowledge from employees and doctors quit
P. Total Effective Knowledge
Q. Average knowledge
R. Increase knowledge from doctors hiring
S. Increase of knowledge from on the job training
T. Increase of knowledge from hiring
U. Decrease in knowledge from decay

Figure-4
Behavior of the model variables in the case hospital

Sensitivity Analyses: Multivariate Sensitivity Analyses (MSAs) was used as a tool for checking validity of the model. In a MSA, probability distributions are defined for uncertain variables, and parameter values are sampled from these distributions and many (e.g. thousands of) sets of parameter values are simulated instead of just one.

Minimum and maximum of variables in the sensitivity analysis are shown in the table 1. Result of the model's variable is shown in figure 4. These simulations are somewhat simplistic because: i. parameter values sampled from the probability distributions do not change during a run, and ii. it is assumed here that the different distributions are independent.

Policy analysis: In this section, the sequence of changes made to create different policies is reproduced. Policy analysis is commonly used as a tool in system dynamics. In the policy analysis, results of the system behaviors in different situation were analyzed before implementation. Encouraged by this finding, three policies were analyzed relative to a base run situation, with focus on the current HRM policy in the ISSO's hospitals and its dynamic effect on the total knowledge level. These policies include: i. Policy one: continuation of current adopted policy based on hiring contract employees; ii. Policy two: stop of current adopted policy based on hiring contract employees from 2010; iii. Policy three: stop of current adopted policy based on hiring contract employees from 2010 and hiring them as long term hiring.

Figure 6 shows the behavior of three variables: total employees, TEK, and average knowledge. In the second and third policies, total employees are decreased in the long term. The decrease is resulted from decision making structure and delays in it. Although TEK is in the upper level in the first policy, average knowledge per each person will be decreased in the long term. The third policy could lead to increase in average knowledge per each person in the long term.

Table-1
Variables name and values for Multivariate Sensitivity Analyses in the case hospital

Variable name	Base run value	Maximum	Minimum
Delay in hiring employee (years)	1.48	2	1
Doctors' experiencing time (years)	4	5	2
Doctors' turnover time (years)	8.82	11	5
Delay in hiring contract employees (years)	0.6	1	0.3
Knowledge decay rate (weeks/year)	0/15	0.20	0/10
Average knowledge of new employees (weeks)	59.9	70	50
Average knowledge of new doctors (weeks)	130	150	130
New doctors quit rate (person/year)	0/05	0.07	0.73
New contract employees quit rate (person/year)	0.2	0.5	0.1
Work weeks per year (weeks/year)	37	40	35

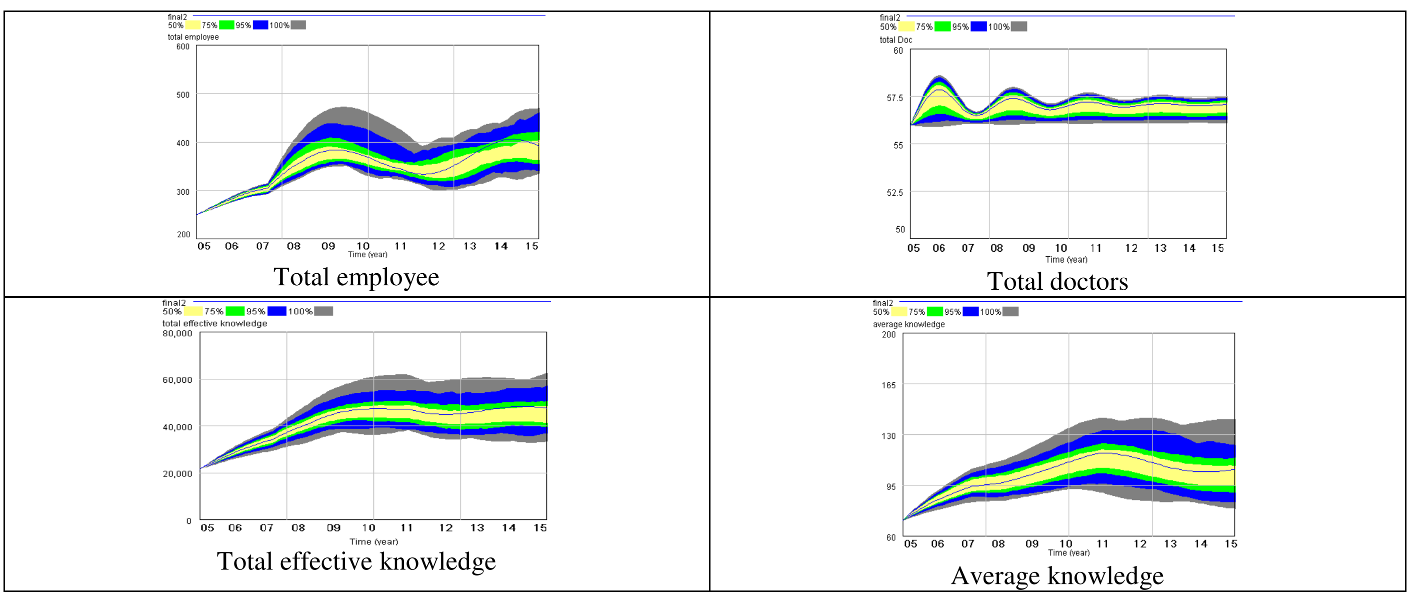


Figure-5
Some model variable behaviors in the Multivariate Sensitivity Analyses in the case hospital

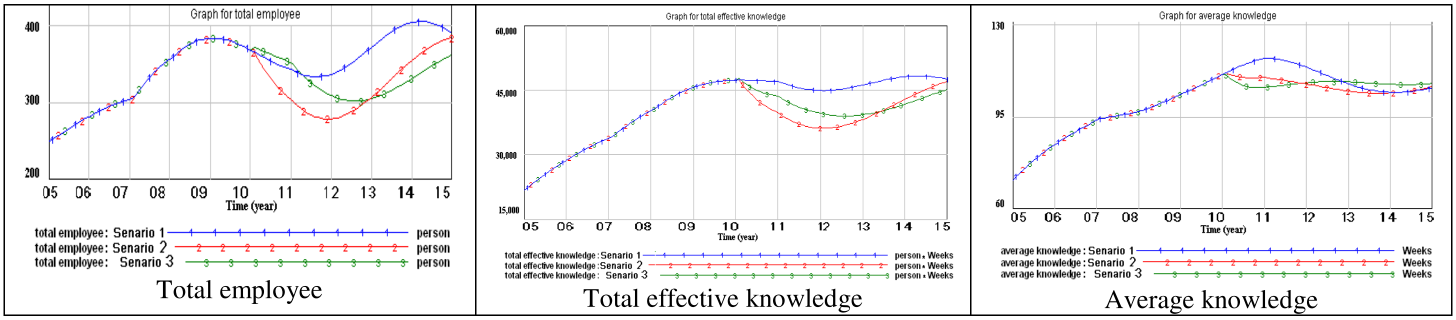


Figure-6
The behavior of three variables of the model in policy analysis

Discussion: The study can be defined as an experimental case study. The purpose of the research is to apply new procedures and techniques that are intended to be helpful to KM in the hospitals. Recent research shows that the different polices in HRM lead to change in TEK in the organization. A major issue for senior executives is ‘‘how do I make sure that the TEK and average knowledge per person maximize in the case hospital?’’ This issue is further developed within a number of areas such as HRM, and KM. Using SDM may be the only way to solve one of the main difficulties connected to HRM and KM, namely the time lag dimension. Few researchers have exploited this idea[13,17-18,23-25]. Knowledge retention is becoming a main challenge in many countries as knowledge becomes a main asset of organizations[27]. Managers could gain interesting and useful insights by using SDM even though the technique is used only for portions of a whole system[13]. In fact, SDM was used for planning, including policy design, interactions with suppliers, with labor, with customers and competitors, financial performance and knowledge management[13,17,22-25].

The hospital case study illustration used for our SDM may be characterized as a KM system, not just for top management, but for local targets. The information used for our SDM is based on information gathered using multiple methods. Some model assumptions, e.g. exact time delay and loops are based on a combination of simplicity and considerations within the case hospital. The SDM approach for KM provides an idea of the quantitative effect from time delays on the outcome from altering input variables.

Although, the idea of SDM in planning is not new, there are few studies combining HRM and KM with a dynamic simulation approach. However, the system dynamics approach has already proven to be a very beneficial technique in other similar areas such as planning, inventory control, goal seeking behavior, oscillations and instability, and forecasts.

As illustrated by Takahashi and Tanaka[23], the time length of employees has significant effect on their knowledge accumulation. Maldonado et al. recognized the importance of knowledge management in service operations and system behavior, and point out the need to guarantee the necessary resources in the design phase[24].

Because of the value of specialist versus generalist human capital[5,6], HRM policies were separated in two processes were employees and doctors. The promotion chains were used to modeling the human resource management policies. As Sterman explains, this structure is very useful in modeling the effect of training and assimilation delays on the productivity of a workforce as the growth rate varies[21]. The promotion chain provides a simple and effective way to model the learning curve for new employees. Because the stock of effective experience is modified by the non-conserved flows of experience accrual and decay, the equilibrium experience of the average worker will not, in general, equal the average experience of new hired employees, as it would in a conserved coflow.

Each employee hired brings a certain amount of effective experience. Employees leaving the labor force take the average experience with them. Each employee accrues additional experience at the rate of 1 week per week-worked. In this example, the unit of time for the simulation was the year, while average experience is measured in weeks. The increase in total effective experience is the number of weeks each person works per year summed over the entire labor force. Although, there is no contraindication in the model, but the research found that on-the-job training affected the TEK much more than the hiring and turnover[21]. Although massive increasing in total number of employees could be cause of the status because of increasing in TEK from hiring, it is seems that he formulation should be reviewed.

The ideas about knowledge-based HRM lead us to think that the key goal of HRM is optimizing the continuous development of the entirety of an organization’s knowledge of employees and their ability to create value. As such, the key process would be developing and managing individuals, competencies and communities[12]. According to this research, successful HRM policies could be affected TEK by hiring, on the job training, quit and forgetting. Morrison discussed knowledge level by learning by doing loop and forgetting loop but increase of hiring and decay did not analyzed in his study[25].

Levy emphasizes the importance of prevention, routinely managing organizational knowledge, and minimizing knowledge loss when people do leave. However, while knowledge management is not yet fully utilized in organizations, managers can learn that there exist well-structured processes for successful KM and minimizing loss[27].

Conclusion

This paper focuses on displaying structure of the HRM policies in order to stimulate for seeking the best policy to deal with knowledgeable people in an appropriate and ethical way, especially in the hospital. The result of simulation suggests applying temporary policy would reduce the TEK and average knowledge per employee in the hospitals. The performance of people and organizations improves generally as a result of increasing knowledge and reduction in the average knowledge could lead to fall productivity and success of the hospitals. It concludes that knowledge management implementations should be analyzed earlier in the policy selection, supported by simulation techniques for scenario-testing and evaluation.

There are also several limitations to our study. One obvious limitation is that the model is based only on one hospital data and therefore is not likely to be applicable in the other hospitals. A second limitation is the distinction made between a mental or cognitive model, which is based on hypothesized relations, and the real life model of real businesses, which is based more on verified and concrete measures. An important weakness of the study is the problem of access to confidential information.

Future work related to HRM and KM with SD could address adapting this and other models to the context/characteristics of specific KM, adapting this and other models to a set of possible substitute HRM and KM, mapping possible dependencies between them, extending the model to explore possible issues and/or extending the current model with the behaviors, performing Exploratory Modeling and Analysis (deep uncertainty analysis) to this and other models, and analyzing the effect of training and assimilation delays on the productivity of a workforce.

References

1. Walshe K. and Smith J., Healthcare Management, Open University Press **(2006)**
2. Hislop, D., Linking human resource management and knowledge management via commitment, *Employee relations*, **25(2)**, 182-202 **(2003)**
3. Mathis R.L. and Jackson J.H., Human Resource Management, Thomson South-Western **(2010)**
4. Som V.C., Exploring the human resource implications of clinical governance, *Health Pol*, **80(2)**, 281–96 **(2007)**
5. Kang S. and Snell S., Intellectual capital architectures and ambidextrous learning: a framework for human resource management, *J Manag Stud*, **46(1)**, 65-92 **(2009)**
6. Kelly G., Mastroeni M., Conway E., Monks K., Truss K., Flood P. and Hannon E., Combining diverse knowledge: knowledge workers' experience of specialist and generalist roles, Personnel Review, **40(5)**, 607-624 **(2011)**
7. World Health Organization, Knowledge Management Strategy, World Health Organization Press **(2007)**
8. Izadi A., Designing A Dynamic BSC Model for Iranian Social Security Organization Hospitals. PH.D. Dissertation. Islamic Azad University, Sciences & Research Branch, Tehran, Iran, **(2010)** [Text in Persian]
9. Teo S.T.T., Lakhani B., Brown D. and Malmi T., Strategic human resource management and knowledge workers; A case study of professional service firms, *Manag Res News*, **31(9)**, 683-96 **(2008)**
10. Rodwell J. and Teo S.T.T., Strategic HRM in for-profit and non-profit organizations in a knowledge-intensive industry: the same issues predict performance for both types of organization, *Public Management Review*, **6(3),** 311-31 **(2004)**
11. Gloet M., Knowledge management and the links to HRM: Developing leadership and management capabilities to support sustainability. Management Research News, **29(7)**, 402 – 413 **(2006)**
12. Monavvarian A. and Khamda Z., Towards successful knowledge management: people development approach, *Business Strategy Series*, **11(1)**, 20-42 **(2010)**
13. Hafeez K. and Abdelmeguid H., Dynamics of Human Resource and Knowledge Management. J Oper Res Soc, **54(2)**, Special Issue: Knowledge Management and Intellectual Capital, 153-164 **(2003)**
14. Nissen M.E., Harnessing knowledge dynamics, IRM Press **(2006)**
15. Martensson M., A critical review of knowledge management as a management tool, *Journal of Knowledge Management*, **4(3)**, 204-216 **(2000)**
16. Jakubik M., Exploring the knowledge landscape: four emerging views of knowledge, *Journal of Knowledge Management*, **11(4)**, 6-19 **(2007)**
17. Naderi I. and Damangir S., The Impact of Firm Knowledge Strategy on its Competitive Knowledge: A System Dynamics Approach. paper presented at the 26th International Conference of the System Dynamics Society, 20 July–24, Athens, Greece, **(2008)** available at: http://www.systemdynamics.org/conferences/2008/proceed/papers/NADER483.pdf accessed 20 February **(2010)**
18. Janamanchi B. and Burns J.R., Offshoring Knowledge Worker Jobs- Boom or Burst for the US Economy. paper presented at the 23rd International Conference of the System Dynamics Society, 17 July-21, Boston, Massachusetts, USA, **(2005)** available at:

http://www.systemdynamics.org/conferences/2005/proceed/papers/BURNS187.pdf accessed 20 February **(2010)**

19. Sourabh B., Applications of DSTATCOM Using MATLAB/Simulation in Power System**,** *Res. J. Recent Sci.,* **1(ISC-2011),** 430-433 **(2012)**

20. Nasiripour A., Afshar Kazemi A., Izadi A., Effect of Different HRM Policies on Potential of employee ProductivityApplications, *Res. J. Recent Sci., **1(6)**, 45-54, **(2012)***

21. Sterman J.D., Business dynamics: Systems thinking and modeling for a complex world, McGraw-Hill, **(2000)**

22. Nielsen S. and Nielsen E.H., System dynamics modeling for a balanced scorecard; computing the influence of skills, customers, and work in process on the return on capital employed, *Manag Res News*, **31(3)** 169-188 **(2008)**

23. Takahashi Y. and Tanaka N., The importance of keeping engineers and knowledge workers inside on organizations' performances, paper presented at the 28th International Conference of the System Dynamics Society, 25 July–29, Seoul, Korea, **(2010)** available at: http://www.systemdynamics.org/conferences/2010/proceed/papers/P1114.pdf accessed 20 February **(2011)**

24. Maldonado M.U., Coser A. and Varvakis G., Modeling knowledge reuse in technical support operations. paper presented at the 27th International Conference of the System Dynamics Society, 26 July–30, Albuquerque, New Mexico, USA. **(2009)** available at: http://www.systemdynamics.org/conferences/2009/proceed/papers/P1066.pdf (accessed 20 February 2010). (accessed 20 February 2011) **(2011)**

25. Martensson M., A critical review of knowledge management as a management tool, *Journal of Knowledge Management*, **4(3)**, 204-216 **(2000)**

26. Sushil, System Dynamics: A Practical Approach for Managerial Problems, Wiley Eastern Publication **(1993)**

27. Levy M., Knowledge retention: minimizing organizational business loss, *Journal of Knowledge Management*, **15(4)**, 582-600 **(2011)**