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Investigating the Relationship between Knowledge Management and Employees' Innovative Behavior at Custom Organizations of Guilan Province

AHMAD SEIF-ALLAHI GILAN-DEH
M.A. student in Public Management
Islamic Azad University, Astara Branch, Astara, Iran
Email: a_seifi_56@yahoo.com

MOUSA REZVANI CHAMANZAMIN
Assistant Professor of Management and Accounting Department
Islamic Azad University, Astara Branch, Astara, Iran
Email: musa2006az@yahoo.com

Abstract

Nowadays organizations operate in an uncertain and complex environment. To achieve certain goals and maintain their position in a competitive world, they are forced to make changes in line with the environment. Knowledge management is one of the processes in which organizations by implementing them are able to keep the knowledge dynamic and fresh throughout the organization. Knowledge has been introduced as the basic and significant criteria in competition and in addition to knowledge, innovation also has been known as significant criteria for survival of knowledge and technology- based companies. Present study aimed to investigate the relationship between knowledge management and innovative behavior of customs employees of Guilan province. This study, considering objective is applied and considering methodology is descriptive survey. Statistical population of present study includes all 243 employees of customs at Guilan province. The sample size using a Cochran formula is estimated as 149 statistical units and sampling technique is stratified random sampling. Data collection tool is questionnaire and in order to determine the validity of the conducted research, collective opinions of scholars are used. For determining reliability, Cronbach's alpha coefficient is used. In descriptive analysis, indicators such as distribution table and frequency percentage, mean, median, mode, and standard deviation.... have been used and in inferential analysis after conducting Kalmogorov-Smiranov Test, in order to accept or reject hypotheses, Pearson's correlation test has been used and for ranking knowledge management aspects, Friedman test has been used as well. Findings suggest that there is a significant positive relationship between knowledge management and its aspects with innovative behavior of customs employees at Guilan Province. Findings of Friedman test also revealed that according to participants, dimensions of knowledge management are significantly different from each other. Also regarding respondents, the highest average in ranking is knowledge application. Knowledge exchange, knowledge organization and knowledge production are next in the ranking.

Key Words: *Knowledge Management, Knowledge Production, Knowledge Organization, Knowledge Exchange, Knowledge Application, Innovative Behavior, Customs Of Guilan Province.*

Introduction

Knowledge management is an interdisciplinary business model which is concerned with all aspects of knowledge production, knowledge encryption, knowledge exchange and knowledge application to improve

learning and innovation in the context of company. Knowledge management deals with both current technological tools and organizational methods including: Production of new knowledge, acquisition of valuable knowledge from external sources, using this knowledge in decision-making, importing knowledge in processes, products and services, encoding information in the documentation, software and databases, facilitating the growth of knowledge, transferring knowledge to other parts of the organization and ultimately measuring effectiveness of knowledge assets and knowledge management. (Leonard, 1990)

Currently innovation in the present technological environment is essential for organizations and most organizations are looking for new ideas. In this regard, organization experts are trying to use knowledge to offer new products or services that customers want, and take steps to create an infra-structure in which innovation is an ongoing process just like learning process, because the purpose of knowledge management by innovation is survival of today's organization. Experts in knowledge management believe that mechanisms of innovation and knowledge management processes are compatible. (Mohammad-Zadeh 1380)

Literature Review

Malhotra (2004) defines knowledge management as doing right things rather than doing things right. (Barney, 1991) According to Holm (2001) knowledge management is production, adaptation, transferring and storage of sound knowledge and information for better policy designing, reforming actions and transferring results. (Loncarevic and Muhic, 2005) Knowledge management is a project that produces knowledge, protects it, absorbs it, coordinates it, combines it, modifies it and distributes it. (Dufour and Steane, 2007)

Beckman (1999) has proposed eight steps for knowledge management process:

1. Identification: internal qualification, source strategy, knowledge domain.
2. Capture: formalizing existing knowledge.
3. Selection: To determine knowledge relation, value and accuracy, elimination of maladaptive knowledge.
4. Saving: To introduce a memory in the knowledge reservoir joint with a variety of knowledge patterns.
5. Distribution: automatically distribution of knowledge for users based on the interest and knowledge of work and collaboration among groups.
6. Application: recycling and using knowledge in decision-making, problem solving, job automation and supervising, and social servicing in job and education.
7. Developing production of new knowledge along with research, job experimentation and creative thinking.
8. Trading-off: sales and trading, development and supplying new knowledge in form of products and services to the market. (Afrazeh 1384)

Polanyi (1966) has divided human knowledge into two categories: *Explicit Knowledge* and *Tacit Knowledge*. Explicit knowledge or encoded knowledge, is a kind of knowledge that can be expressed in form of systematic and official language, and is transferable. On the other hand, tacit knowledge has individual characteristics and this fact makes its regulation and transfer specifies. For Polanyi, tacit knowledge is comprehensive knowledge of human mind and body while explicit knowledge can be reserved in libraries, archives and databases and can be evaluated based on a consecutive basis. Explicit knowledge is a widespread knowledge which can easily be shaped. Explicit knowledge includes what an organization or individual already knows and it can be pretty easily communicated with. For example the fact that if a person goes out in the rain without an umbrella will be wet, is an explicit knowledge. Tacit knowledge is a knowledge which usually is maintained by an individual as a result of his own experience. Holders of such knowledge, are "expert" in such context. Most often, this knowledge through words, verbal or other informal processes are transferrable to others. (Etezari 1385).

Tacit knowledge is formed up of mental models, beliefs and convictions of every individual which have taken its place in his mind in such a way that are considered evident. Tacit knowledge rooted within people and expressing it in form of words is difficult. The knowledge rooted in the culture of the organization is also known as tacit knowledge. In most organizations, tacit knowledge is rarely exchanged or shared. Therefore when the owner of such knowledge leaves the organization, this type of knowledge is lost and therefore tacit knowledge does not satisfy the long-term interests. Tacit knowledge is scarce, irreplaceable, inimitable and valuable. Tacit knowledge through the process of externalization, known as apparent knowledge can be acquired and accessing it becomes possible. (Nonaka, 1994).

Table 1: Effective factors in Knowledge Management

Explanations	Factors	
Extending abilities and providing basis for individual growth and development by using vertical relationships and information distribution, granting options and responsibilities to sub-sets (Abily 1389).	Empowerment (empowering employees)	Individual Factors
Knowledge exists among individuals and is an inseparable part of human beings. (Zavareghy 1388).	Personal knowledge of individuals	
Training is an experience based on learning and is built in human beings for making pseudo-stable changes in individuals in order to make him able for work, improving abilities, changing skills, knowledge, attitude and social manners. (Seyyed Javadian 1382).	Human resources training	
Human resource development program, Mandatory of publication research, Recruitment based on knowledge competence, Prioritizing development of knowledgeable workers human resources, Payment based on knowledge competence, Upgrading based on knowledge competence, Maintenance and improvement of knowledgeable workers, are mechanisms to reflect scientific opinions etc. All are issues related to human resources management which are the basis for applying knowledge management in organizations; because human resources are the only source of knowledge production, they are knowledge producers and a notable proportion of organization's knowledge is in their mind. (Rahnavard and Mohammadi 1388).	Human resource management	Management Factors
A high level of employees' confidence in the ability of individuals and positive attitude relative to colleagues, will increase his confidence toward knowledge acquisition from his colleagues which would be useful for him. In fact, knowledge management is managing individuals of an organization. (Alavai et al., 2009).	Trustibility	
The organization's management commitment towards implementing knowledge management system also plays an important role in its success. (Loye, 2008)	Support of organization's manager	
Knowledge management without collaboration of all personnel of organization is impossible (Morad-Zadeh 1385).	Team work	
Organizational culture includes: common beliefs, attitudes, assumptions and expectations which in the absence of rule or explicit procedures guides the behavior and can be a	Organizational culture	Organizational Factors

powerful source of identity, common purpose and flexible guidelines. (Abily1389).		
Transferring information and knowledge between individuals and organizations in the micro levels and macro levels, depends on the individual, to facilitate and accelerate this transfer. As a result, all the factors involved in encouragement or prevention of their interpersonal communication, will affect individuals' information exchange. (Damvari et. al. 1388).	Social capital	
The type and structure of the organization affects the communication within the organization and among members and this would accelerate or slows down information and knowledge distribution in an organization. (Jafari and Akhavan 1385).	Social structure	
Information technology and telecommunications, are inherently strong and powerful mechanisms of information transfer and this leads to possibilities of gaining knowledge via different methods. (Moghei 1387).	Information and communicational technology	
Organizations should be involved in organizational learning, hence according to their need for specific knowledge, continuous learning and necessity of knowledge management will be considered. It is because without a variety of learnings, new knowledge would not be produced. (Niyaz – Azari and Amuyi 1386).	Organizational learning	

Innovation

Innovation is acceptance of an idea or behavior (including system, policy, program, device, process, or product) which is for new organization. Innovation can be divide into two categories: technological innovation and organizational innovation. (Sedghiyani and Dehghan 1389)

Innovation represents the development of a new product, a series of new services or new production system in which there is experience of exclusive knowledge. Wang and colleagues suggest that the concept of innovation is a process that its beginning is with a novel idea and ends with introducing it to the market. (Chen & Huang, 2009) A company's knowledge-based theory suggest that knowledge is the only viable source that may provide competitive advantage in an infra competitive environment. Hence agreeing on a specific perspective of knowledge management for of product innovation management may increase the likelihood of success. Therefore building a foundation of knowledge to survive in this new era trading is critical. (Noori and Ebrahimi 1384)

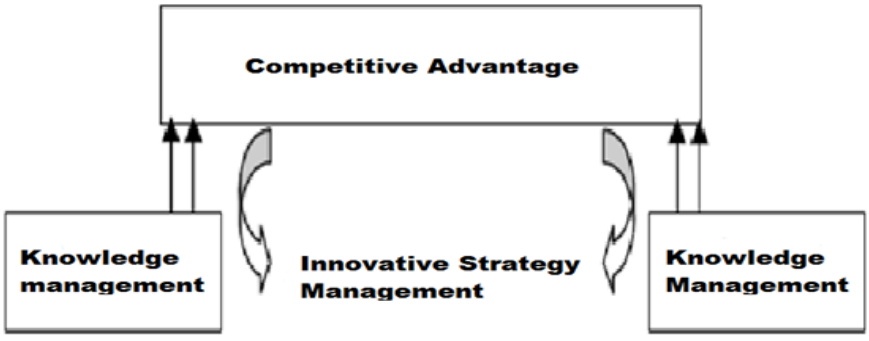

Figure 1: Innovation knowledge as a source of competitive advantage (Kavoosi and Sarfarazi 1389)

In the year 2000, E.U. in response to globalization and knowledge-based economy changes, and in order to achieve their goal (promoting innovation among member countries and becoming the most dynamic knowledge-based economy in the world) announced index of measuring innovation in four groups at national level:

- Human resources: amount and quality of human resources are considered as determinant of original creation and propagation of new knowledge in the whole economy.
- Production of new knowledge: Indicators related to knowledge production, capacity and innovation status of countries are measured.
- Transfer and application of new knowledge: this sphere covers informal innovative activities such as adaptation of new equipment for servicing companies and industrial companies, adoption of innovations that have been developed by other companies or organizations and adoption of new knowledge for the specific needs of companies.
- Financial affairs and innovative organizations: This class covers the following indicators: the supply of venture capital for advanced technology, selling innovation etc.

Knowledge has been known as fundamental and most important factor in competition and next to knowledge, innovation also is known as the most important factor for survival of companies. In theoretical background related to innovation, knowledge have been proposed as one of the most important components of process of innovation production. Effective knowledge management makes knowledge communications easier and changes the needs of innovation movements and moreover increases innovative practices through development of new insights and abilities. (Nonaka and Takeuchi, 1995)

Conceptual Model of The Research

Given various aspects of knowledge management, Jashapara defines knowledge management in form of a four-loop cycle as: effective learning processes which is associated with production, organizing, sharing knowledge (both implicit and explicit) and applying it that leads to elevation of organizational intellectual capital and improves its performance. (Jashapara 2004).

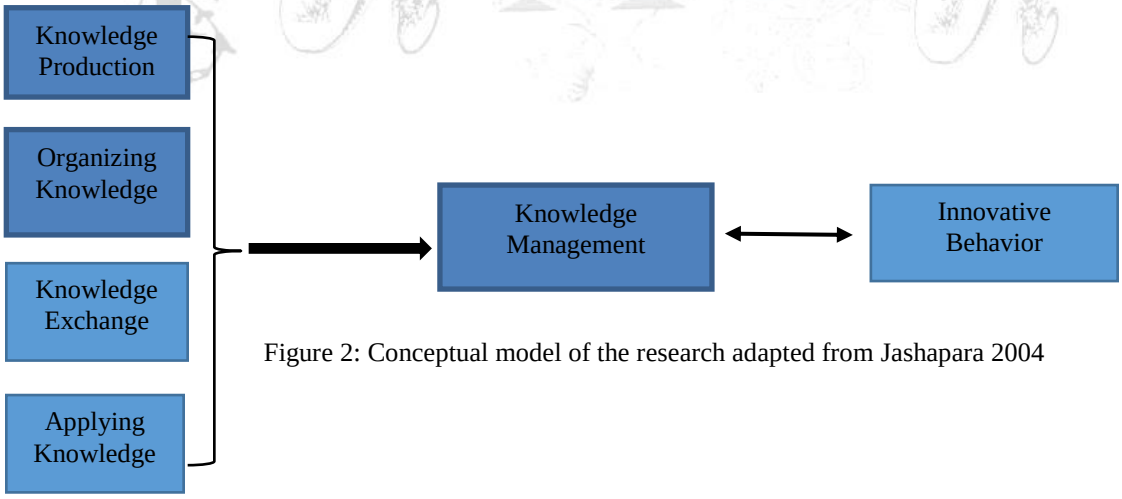

Figure 2: Conceptual model of the research adapted from Jashapara 2004

Research Hypothesis

Main hypothesis: there is a significant relationship between knowledge management and innovative behavior of customs employees of Guilan province.
Secondary hypothesis 1: there is a significant relationship between knowledge production and innovative behavior of customs employees of Guilan province.

Secondary hypothesis 2: there is a significant relationship between organizing knowledge and innovative behavior of customs employees of Guilan province.
Secondary hypothesis 3: there is a significant relationship between knowledge exchange and innovative behavior of customs employees of Guilan province.
Secondary hypothesis 4: there is a significant relationship between application of knowledge and innovative behavior of customs employees of Guilan province.

Research Methodology

The purpose of present study is applied. Scientific studies based on their defined goals are divided into three classes: Fundamental researches, applied researches, development (extensional) researches (Sarmad et. al. 1381). The purpose of applied research is to obtain necessary perception or knowledge to determine the means by which an identified and known necessity can be satisfied. (Khaki 1379) In terms of methodology present study can be categorized as scientific studies. Scientific research solves problems, follows a step-by-step, logical, systematic and accurate procedure to identify problems, collect data and analyze the collected data in order to get valid conclusions from them. (Sekaran 1386) On the other hand, present study in terms of research classification with respect to their goals, should be classified as descriptive. The purpose of any descriptive study is to describe those aspects of phenomenon regarding researcher/s' interest with an individual, institutional, industrial etc. point of views. (Sekaran 1386) In terms of supervision and level of control, present research is a field study. In general, field studies are non-experimental scientific studies that seek to explore the relationships and interactions between real structure variables under review conditions. (Khaki 1379)

Statistical Population, Sample Size and Sampling Methods

Statistical population of present research are Guilan customs employees, and in order to determine the number of statistical population's exact members, Astara and Anzali's Customs Recruitment Division has been asked to provide reliable documents that ultimately the number of 243 individuals were reported. In calculating the sample size, Cochran formula is used as following:

$$n = \frac{Nt^2pq}{Nd^2+t^2pq} = \frac{243\times(1.96)^2\times0.5\times0.5}{243\times0.05^2+(1.96)^2\times0.5\times0.5} = 149$$

In the formula above generally, the maximum permissible errors are represented by (d) and is considered to be 0.05, t =1.96, Reliability Coefficient is equal to 0.95, values of ***p*** and ***q*** (proportion of the population without specified attributes) are each equal to 0.5 and Population Size = N.

Table 2. Statistical population classes based on their provincial customs

Name of Customs	**Number of Employees**	**The Number of Allocated Sample** (according to stratified random method)
Astara	113	69
Anzali	130	80
Total	243	149

Sampling method for the present study has been classified random sampling method with proportional allocation. It is also notable to know that out of 149 questionnaires distributed among statistical population, according to calculations of table above, 140 questionnaire were returned i.e. the return rate of questionnaires completed and returned approximately is 94 percent.

Tools and Methods for Data Collection

In this study, data collection instruments are questionnaire and the method used here is field study. Field study is applied to those methods that researcher inevitably refers to individuals or organizations etc. and through direct contact with them collects the information about the phenomenon in his mind.

Reliability and Validity of Research Tools

The validity (credibility): in content validity, research refers to professors and scholars' professional opinion for validity of his measurement in the evaluation of research variables for further certainty. In this study, for questionnaire designing concerning knowledge management Fung and Choi's questionnaire (2009), and in designing innovative behavior questionnaire, questionnaire of Saatchi et al (1389) have been used. Note that in consultation with supervisor professor adjustment and reforms was made in the questionnaires proportional to statistical population so that predefined objectives of the research can be achieved.

Reliability (stability)

Yet another method of calculating reliability is using Cronbach's alpha. The following formula specifies the method of calculating for this value:

$$r_a = \frac{J}{J-1}(1-\frac{\sum S_i^2}{S^2})$$

J = the number of questions in the questionnaire or test
S^2 = total variance of the questionnaire
S_i^2 = = variance of questions

To do this, at first a number of questionnaires were distributed among 30 of these statistical population and then Cronbach's alpha coefficient was calculated based on their answers and following results obtained:

Table 3: Cronbach's alpha

Obtained Cronbach's Alpha	Number of Question	Questions Concerning …
.846	8	Knowledge production
.882	9	Knowledge organization
.738	5	Knowledge exchange
.809	3	Knowledge application
.948	25	Knowledge management
.939	8	Innovative behavior
.964	33	Total questions

Eventually, total number of questions consisting of 33 questions in these questions has the Cronbach's alpha of 0.964. As the table above indicates the Cronbach's alpha coefficient obtained for the questions of knowledge management and its dimensions plus innovative behavior is higher than 0.7 which demonstrate high reliability of the questions.

Description of Research Variables

Information collected in the following tables are presented in brief:

Table 4: Frequency of research variables

Frequency Percentage	Frequency		variable
76.4	107	**male**	**Gender**
23.6	33	**female**	
100	140	**Total**	
15.0	21	**30 years or less**	**Age**
50.7	71	**31 – 40 years**	
21.4	30	**50- 41 years**	
12.9	18	**51years or higher**	
100	140	**Total**	
8.6	12	**Diploma**	**Education**
15.0	21	**Associate Degree**	
58.6	82	**B.A.**	
17.9	25	**M.A.**	
100	140	**Total**	
34.3	48	**Official**	**Employment Type**
27.9	**39**	**Conditional**	
37.9	**53**	**Contractual**	
100	**140**	**Total**	
15	**21**	**5 years or less**	**Job Experience**
14.3	**20**	**6 – 10 years**	
42.1	**59**	**11 – 15 years**	
17.1	**24**	**16 – 21 years**	
11.4	**16**	**21 years or higher**	
100	**140**	**Total**	

Table 5: Description of research variables

Standard Deviation	Mean	Maximum	Minimum	Variable
.738	3.40	5	2	Knowledge production
.682	3.45	5	2	Knowledge organization
.753	3.49	5	2	Knowledge exchange
.936	3.58	5	1	Knowledge application
.642	3.39	5	2	Knowledge management
.852	3.49	5	1	Innovative behavior
				N= 140

Normal Distribution of Variables

In order to use statistical techniques, at first it should be specified whether collected data has been distributed normally or abnormally? To this end (to test normal distribution of data), Kolmogorov-Smirnov test is performed:

Table (6): normality test results of variables

Level of Significance	Kolmogorov-Smirnov Test	Variable
0.371	3.588	Knowledge production
0.098	3.985	Knowledge organization
0.072	3.205	Knowledge exchange
0.085	2.601	Knowledge application
0.079	3.454	Knowledge management
0.063	3.665	Innovative behavior

In describing the test results represented above, note that since the obtained significance is more than 0.05, hence the research variables has been normally distributed; and to test research hypotheses parametric tests are used, which in this part, it is the Pearson correlation coefficient.

Table (7): The results of testing hypothesis

Result	Significance Level	Correlation Coefficient	Determinant Coefficient	Error Rate	Hypothesis
Hypothesis confirmed	.000	.550	.303	0.01	There is a significant relationship between knowledge management and innovative behavior of customs employees of Guilan province.
Hypothesis confirmed	.000	.525	0.275	0.01	There is a significant relationship between knowledge production and innovative behavior of customs employees of Guilan province.
Hypothesis confirmed	.000	.661	0.437	0.01	There is a significant relationship between knowledge organization and innovative behavior of customs employees of Guilan province.
Hypothesis confirmed	.000	.616	0.379	0.01	There is a significant relationship between knowledge exchange and innovative behavior of customs employees of Guilan province.
Hypothesis confirmed	.000	.510	0.260	0.01	There is a significant relationship between knowledge application and innovative behavior of customs employees of Guilan province.
N= 140					

Friedman's Test to Prioritize Aspects of Knowledge Management

Friedman testis is equivalent for variance analysis with repeated measures (within the group), which is used to compare the average rating between k variable (Group).

Table (8): Rating dimensions of knowledge management based on Friedman test.

Average Rating	Variable
2.38	Knowledge Production
2.45	Knowledge Organization
2.52	Knowledge Exchange
2.66	Knowledge Application

Table (9): Friedman Statistical Tests

140	Number
8.286	Chi-square test
3	Level of Freedom
0.041	Significance Level

Friedman test results suggest that considering respondents dimensions of knowledge management are significantly different from each other. Also the highest average rating in terms of respondents is knowledge application. Knowledge exchange, knowledge organization and knowledge production are next in ranking.

Results and Suggestions for Further Studies

Given the fact that the main hypothesis of this study proves that there are significant positive relationship between knowledge management and innovative behavior of customs employees of Guilan Province. Separating subsidiary hypothesis, following cases are suggested:

1. Concerning the research's first subsidiary hypothesis: The results of the surveys revealed that there is a positive significant relationship between knowledge production and innovative behavior. Therefore, the following options are recommended:

- Specialized and working groups should be considered for activities.
- Specialists must be asked to train employees.
- Organizing training courses and workshops for employees.
- Preparing a basis for development of creativity and innovation in work processes of employees.
- Organizations should benefit from new and appropriate ideas.

2. Concerning the research's second subsidiary hypothesis: The results of the surveys revealed that there is a positive significant relationship between knowledge organization and innovative behavior. Therefore, the following options are recommended:

- New guidelines on regular basis and in a timely manner should be provided for relevant units.
- Procedures should be available for employees clearly and vividly.
- Documents should be classified in the archives, based on the different access levels.
- Every division must organize their data before saving them.
- Adjusting guide (FAQ) for employees' easier access to certain information on certain subjects.
- The experience of employees should be used.

1. Concerning the research's third subsidiary hypothesis: The results of the surveys revealed that there is a positive significant relationship between knowledge exchange and innovative behavior. Therefore, the following options are recommended:

- Connection of different division's employee's should be facilitated.
- Experienced employees should advice and transfer their experiences to younger employees.
- Different units should cooperate with each other in executing various activities.
- Technology should be used for knowledge exchange between employees.
- Knowledge promotion and teaching culture should be created as the norm, and eliminating the belief that knowledge transfer would eventually lead to employee's loss of current position.

2. Concerning the research's third subsidiary hypothesis: The results of the surveys revealed that there is a positive significant relationship between knowledge application and innovative behavior. Therefore, the following options are recommended:

- New knowledge must quickly be usable in the organization.
- Individuals must be able to use new knowledge in order to achieve organizational goals in the shortest time.
- New knowledge should not be a barrier for proper functioning.
- Employees should be able to use their knowledge to develop new services.
- Proper knowledge should be transferred to those who need it to do their responsibilities.

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