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Modeling Effective Factors in Relationship between Knowledge Management and Innovation in Mashhad Metropolitan Municipality

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Abstract

Today, the organizations widely implement the knowledge management as the most effective method for creating a competitive advantage with the goal of systematic management of knowledge and intellectual resources. Knowledge as a main source for innovation and organizational efficiency is of great importance. The present research aims at modeling the factors influencing the relationship between knowledge management and innovation in the Municipality of Mashhad Metropolitan. The present investigation is applied in terms of objective and in terms of data collection method is descriptive-survey. The statistical population consists of all employees in the central municipality of Mashhad, Mashhad Municipality ICT, who are a total of 1028 employee. To determine the sample size, Morgan table is used and the sample size is calculated as 278 that finally 269 questionnaires were returned and analyzed. To analyze the research data, the modeling in Partial Least Squares method (PLS) is used. The results show the direct impact of knowledge management on innovation in the delivery of services (services delivery method) to citizens in the municipality of Mashhad, but the knowledge management has no impact on the services provided (nature of services provided).

Keywords: Modeling, Knowledge Management, Innovation, Mashhad Municipality

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1. Introduction

Knowledge management is a process that helps organizations identify, select, organize, and transfer important unstructured information and expertise which are a part of the organization memory. In fact, knowledge management supports innovation, creates new ideas, and utilizes the organization thinking power (Soroori Ashliki, 2012). Today, organizations widely implement knowledge management as the most effective method to create competitive advantage with the purpose of systematic management of their intellectual and knowledge resources (Barzinpoor and Asadi, 2011). In order to survive, all organizations need innovative new ideas that are blown into the body of organizations like souls and save them against destruction and annihilation. The emergence of knowledge innovation not only enables the organizations to gain competitive advantages over their competitors but also provides a useful tool for improving organizational performance (Dehghan Najm, 2009). Knowledge as a major source of innovation and organizational efficiency is of extraordinary importance. The main goal of knowledge management is to create an environment where people can develop their knowledge, communicate with each other, share their knowledge with each other, and ultimately use it. Application of knowledge, in turn, leads to innovation in organization, so the knowledge management is often known as the main source and the basic requirement of innovation process in organizations (Perez, 1999). Flexibility and rapid response to the changing environmental conditions, better use of human resources and their knowledge and also making better decisions are the achievements of knowledge management for today's organizations (Shahrarai and Madani Poor, 2004). Organizations with greater innovation will be successful in developing new capabilities that help them achieve higher performance (Montes et al., 2004). Generally, knowledge management is classified into five levels including knowledge creation, knowledge sharing, knowledge utilization, knowledge storage, knowledge acquisition (Nonaka et al., 2000). Innovation in service organizations are also studied in two levels of service innovation and service delivery process innovation (Lee, 2009). If innovation is radical in the service sector organizations seek to create new services for undefined markets, new services for existing markets or to offer new services to existing customers and if innovation occurs gradually it only changes the face of available services (Paul et al., 2002). On the other hand, in service sectors the main focus is on process innovation. Process innovation in service organizations is defined as "Organization tendency to support new ideas and creativities to develop new processes" (Vaccaro et al., 2010). Mashhad municipality aims to facilitate knowledge management processes and activities to achieve and move towards a learning and knowledge-based organization. Knowledge management group of Mashhad municipality began its activity as an independent group in 2012. It has increased the organization efficiency by flourishing the comprehensive system of knowledge management and is trying to predict and remove challenges it faces as soon as possible to achieve its potential position in national and transnational levels more quickly and strongly (http://www.km.mashhad.ir/). Knowledge management is a new concept in Iran and municipal employees are nor familiar with this system. On the other hand, the great diversity of services offered to the citizens in municipality increases the complexity of the task. The most

important challenge is to provide an appropriate organizational culture bed for the knowledge dissemination. In this regard, Mashhad Municipality has published manuals about the knowledge management experiences of the municipality managers, has held workshops to share knowledge and has tried to set up thinking rooms and to nurture knowledgeable employees and has won the fourth national award of knowledge management as the knowledge management activist organization (http://www.km.mashhad.ir/). Accordingly, the present research aims to model the factors affecting the relationship between knowledge management and innovation in the municipality of Mashhad metropolis. The research hypotheses have been formulated as the following:

1.1 Main Hypotheses

1. Knowledge management affects process innovation in Mashhad municipality.
2. Knowledge management affects service innovation in Mashhad municipality.

Secondary Hypotheses

1. Knowledge creation affects process and service innovation in Mashhad municipality.
2. Knowledge sharing affects process and service innovation in Mashhad municipality.
3. Knowledge application affects process and service innovation in Mashhad municipality.
4. Knowledge storage affects process and service innovation in Mashhad municipality.
5. Knowledge acquisition affects process and service innovation in Mashhad municipality.

1.2 Methodology

The present research is an applied research in terms of objective and a descriptive-survey research in terms of data collection method. The research population consists of all the employees of Mashhad central municipality and ICT department which is totally 1028 subjects. In order to determine the sample size the Morgan table has been used since the number of population is relatively known. The research sample size is calculated to be 278 subjects and the simple random sample has been selected. Overall, 269 questionnaires were returned and analyzed. Data collection tools are organizational innovation questionnaire including 12 questions and knowledge management questionnaire including 31 questions. Since the questionnaires were designed by the researcher their face validity was measured through the experts' opinions and in order to measure their content validity factor analysis technique was used. Moreover, Cronbach's alpha coefficient was used to evaluate their reliability. As displayed in Table (1), Cronbach's alpha for all the research variables is within the acceptable limits (more than .70) and the factor analysis results are presented in Table (5) (inferential findings) which is greater than .60 for all variables. This amount is approved.

Table1. Cronbach's Alpha for variables

Variable	Cronbach's alpha
Knowledge creation	.853
Knowledge sharing	.770
Knowledge application	.785
Knowledge storage	.805
Knowledge acquisition	.701
Service innovation	.780
Process innovation	.800

Source: research findings

In order to analyze data, Hulland [4](1999) two-step method was used for modeling via partial least square method. The first step is determining the measurement model through estimating the validity and reliability and the second step is determining the structural model through the analysis of fitness indices, correlation coefficient, and path analysis.

2. Literature Review and Theoretical Consideration

Several studies have been done on measuring the impact of knowledge management system on innovation. However, the innovation of the present research is first in terms of evaluating the performance of knowledge management system in Mashhad municipality with regard to winning the national award of knowledge management as the knowledge management activist organization in 2012 (www.km.mashhad.ir) and second in terms of research method and analysis of knowledge management and innovation in Mashhad municipality via PLS modeling. The results of the studies correlated with the present study are briefly expressed in the following.

Safarzadeh et al. (2012) in a research entitled "The effect of knowledge management strategies on organizational innovation and performance" (Case study: Sanitary and Health Centers of North of Fars) investigated knowledge management dimensions as independent variable and organizational performance and innovation as dependent variables. The results of the research showed that knowledge privatization and encoding would have a positive effect on

[1.] Hulland, J. (1999), "Use of partial least squares (PLS) in strategic management research: a review of four recent studies", Strategic Management Journal, Vol. 20, No. 2. Pp.195-204.

innovation and organizational performance. Moreover these variables would have a positive effect on organizational performance through innovation and there is a positive and significant relationship between innovation and organizational performance.

Kohestani (2007) in a research entitled "the role of knowledge management in innovation of leading companies" (Case study: Mashhad Gas Company) has studied the relationship between tacit knowledge and innovation. The results indicate that there is a close and direct relationship between knowledge management and innovation. As the tacit knowledge is converted to hidden knowledge more and more, innovation is created more than before. The most important strategy to improve knowledge management performance is to develop and enhance motivation in employees to flourish individual and organizational knowledge.

Soroori Ashliki (2012) in a research entitled "empirical and theoretical study of the role of knowledge management on innovation" compared the empirical researches on the role of knowledge management in organizational innovation and explained the common features of the researches. Finally, it was concluded that knowledge management is the same as knowledge organization and innovation should be sought in the heart of management because competitive advantage is hidden in innovation.

Darroch (2005) in an article entitled "knowledge management, innovation and organizational performance" studied the current position of knowledge management in 213 trading companies in Amsterdam and its effect on innovation and performance of 1045 employees and 456 senior managers. The results indicate that knowledge sharing has the highest effect on promotion of innovation and performance of employees. Some of the trainees and new recruits in the studied companies have acknowledged that the culture of knowledge sharing and the use of experience and tacit knowledge of managers have great effects on reducing errors and improving the level of their organizational performance. Moreover, the employees who have wider horizons in applying knowledge management principles and participate in knowledge sharing culture are more innovative in offering services to the target customers.

Lee (2009) in an article entitled" Avoiding hierarchical structure to assess the effect of innovation factors on competitive advantage of companies in Taiwan" has examined different kinds of administrative bureaucracy and bureaucratic obstacles to implement knowledge management. In this research, after extracting innovation indices, the effect of five levels of knowledge management on innovation factors as dependent variables has been investigated. The results indicate that in organizations that are ruled with strict hierarchy and bureaucracy knowledge flows hardly and sometimes knowledge sharing, knowledge creation, knowledge acquisition and maintenance are not significant. Similarly, the rate of creativity and innovation of the staff is less because boring and official procedures prevent the flow of knowledge and innovation. Therefore, there is a close relationship between knowledge management and innovation.

2.1 Innovation

Innovation is very important for companies and organizations because it can provide sustainable competitive advantage for them (Weisberg, 2006). Many companies are facing lots of problems in their competitive environment which are due to quick changes in the environment (Sehat and Mohammad Poor Dustkoohi, 2014). In this regard, managers and staffs should use their creativity and innovation in order to match and coordinate with rapid changes, production lines, management methods, production processes and services (Castiaux, 2007). From the competitive perspective, organizations that encourage innovation to achieve competitive advantages make use of new ideas and knowledge of employees and managers for new production, services, technology, and managerial methods (Yang, 2010). Product innovation includes products or services that will benefit customers or clients and process innovation includes managerial and administrative knowledge, equipment, facilities and methods that are used in production process by offering services. Gradual innovation does not mean many changes in current business but it probably provides an opportunity for companies that are established based on existing techniques and promotes their internal competence. Most innovations appear gradually and often in the form of modification of existing products. On the contrary, fundamental innovations lead to the removal of existing competence and take the available knowledge and skills out of the organization. Such innovations need different management practices. They originate from scientists and are classified as technology pressure innovations and are very important for achieving long-term successes (Choi et al., 2008).

2.1.1 Innovation Components

Generally, the components forming and influencing innovation in service organizations, according to the experts' opinions, are collected and encoded in Table (2):

Table 2. Innovation Components

Innovation in Process (IP)			
Index	**Definition**	**Source**	**Code**
Unofficial methods	Using unofficial process to produce and nurture idea	(Dolog et al., 2009)	I 1
technology	Using new technology to develop service process	(Cardinal, 2001)	I 2
Support idea nurturing and creativity	Developing new and non-traditional solutions	(Grant, 1996)	I 3
Minimum bureaucracy	Easier access to services	(Darroch, 2005)	I 4

Formal methods	Using formal process to improve services	(Gupta and Sharma, 2004)	I 5
Strategy and perspective	Using specific and developed strategies	(Lee, 2009)	I 6
flexibility	Using managerial strategies Flexibility to conflict with changes	(Fariba, 2005)	I 7
Innovation in Service (IS)			
Index	**Definition**	**Source**	**code**
Need assessment according to age group	Offering services and products according to needs of different age groups	(Robbins, 1998; Lee, 2009)	I 8
Quality promotion	Improving present services and promoting service quality	(Cardinal, 2001)	I 9
technology	Offering electronic products and services associated with modern technology	(Choi et al., 2008)	I 10
Speed and accuracy	Rapidly identifying urban needs and Citizens and providing Contingency Services	(Vaccaro et al. 2010)	I 11
Expansion	Offering a wide range of Products and Services	(Dolog et al., 2009)	I 12

Source: Authors

2.2 Knowledge Management

In spite of several definitions for knowledge, the important point in the knowledge management is its application in organization and its evolutionary process compared to the past (Adamides and Karacapilidis, 2006). Knowledge in management means the knowledge after the information. According to Davenport and Prozac knowledge stems from information which is obtained through comparison, determining outcomes, communication and dialogue, and reasonable argument. Some experts believe that knowledge level is beyond explicit knowledge in the organization and believe in another dimension of knowledge as tacit or hidden knowledge (Biglari and Madhooshi, 1999). The study conducted by Nonaka and Takchi (1995) showed how knowledge is created, used, and shared in organizations and how it contributes to innovation distribution. Knowledge management is a rotational process that involves the following steps:

Knowledge creation: Knowledge initially stems from the staff skills and experiences. In other words, when people are trying to find out how to do work they create knowledge. If the knowledge cannot be created within an organization, it will be imported from outside.

Knowledge accumulation: the produced knowledge should be stored in database in its own raw form. Many organizations take the necessary measures in this regard through designing information systems and data storage systems.

Knowledge refinement: New knowledge should be in a bed that is easily accessible so that it can be used properly. At this stage, implicit knowledge enters the scene and is refined together with explicit knowledge.

Knowledge storage: encoding explicit and implicit knowledge contributes to the accessibility and proper storage of knowledge for necessary applications.

Knowledge management: like a library, knowledge must be kept up-to-date and it must be examined and revised, as well.

Knowledge publication and distribution: Knowledge should properly be accessible for those who need it. In this respect, new technologies such as groupware, internet, intranet, assist the decision support systems and organization management information systems to disseminate information (Nonaka et al., 2000; Xu and Li, 2009). According to this process, three general objectives of knowledge management process are: knowledge distribution in organization, knowledge creation and innovation promotion, enhancing staff participation and support and consequently increasing the skill level of employees.

Table (3) shows five levels of knowledge management and related measures of each level which are encoded as KM:

Table 3. Criteria for five levels of knowledge management

Knowledge management			
Definition	**Criteria**	**Code**	**Component**
Learning from the staff mistakes	Learning	KM1	Knowledge management-Create
The value of production of knowledge and new ideas in the organization	Value of producing new idea	KM2	
adequate space to implement the new theories and ideas	Knowledge spacing	KM3	
ideas management system Like the proposals,	Idea management	KM4	

Thinking room , Advisory Council, etc in organization	system		
Specific mechanism to convert staff implicit knowledge to explicit knowledge	Specific and targeted mechanism	KM5	
Information systems to promote organizational knowledge	Information systems	KM6	
Specific outlook and strategy in knowledge area	Outlook and strategy	KM7	
The sharing of knowledge and experiences with colleagues in the organization	Sharing knowledge and experiences	KM8	Knowledge Management - Sharing
Encouraging individuals to share their knowledge	Encourage to share knowledge	KM9	
Necessary information to share knowledge in organization	Necessary information	KM10	
The popularity of teamwork within the organization	Making teams	KM11	
Sufficient trust in the organization to provide individuals' knowledge to the organization	Confidence	KM12	
Regular meetings for the exchange of information between authorities and staff	Information exchange meetings	KM13	
Sharing knowledge in the workplace as a benchmark for evaluating the performance of employees	Performance assessment	KM14	
Making the right decision Given the existing knowledge in the organization	Effective decision-making	KM15	Knowledge Management- Application
Feedback loops between behavior and its results in organization	Feedback	KM16	
use of one's own knowledge for organizational goals	Consistency with target	KM17	
Identifying key personnel to register and maintain their knowledge	Identifying knowledgeable force	KM18	

The use of individuals' knowledge in decision making	Knowledge in making decision	KM19	
Using knowledge to solve most of organizational problems	Solving problem	KM20	
Recording and keeping information related to the staff knowledge	Recording knowledge information	KM21	Knowledge Management-Storage
Registration and maintenance of research and valuable experiences	Recording staff experiences	KM22	
Recording and storing information about clients	Recording customers information	KM23	
Documentation and maintenance of project-related information	Projects documentation	KM24	
Organization's being equipped with an electronic memory	Electronic memory	KM25	
Documentation and maintenance of the important lessons learned in the success or failure	Documentation of success/failure	KM26	
Mechanisms for updating the stored knowledge	Updating stored knowledge	KM27	
Encouraging employees to Job rotation In the organization	Job rotation	KM28	Knowledge Management-Obtain
Encouraging employees to find alternative solutions to perform assigned duties in the organization	Finding alternative solutions	KM29	
Entrance of new knowledge employees to the organization will improve the staff performance	Admitting new knowledge forces	KM30	
Review of past mistakes will be effective in increasing the staff experiences	Past errors	KM31	

Source: Nonaka et al., 2000; Xu and Li, 2009

2.3 Knowledge Management and Innovation Processes

Table 4 evaluates each of the main processes of knowledge management and innovation mechanisms associated with the relevant levels:

Table 4. Knowledge management and innovation processes

Innovation mechanism	Knowledge management processes
• incentive bonuses / stimulus • stimulating discontent • Encouraging trials and denying expertise • Introducing change: the views, groups, environment • the culture organizational and team assessment	Knowledge creation
• Encourage learning and teaching (often alternating) • internal and external resources (community) • opportunities (Look at box outside) • Means or Media to store Ideas usable or unusable	Knowledge acquisition
• Strategic Commands • Organizing functional or process knowledge • questioning existing practices • Using different perspective and views (sharing ideas)	Organizing
• The relationship between those who know and those who need to know • encourage to share ideas • Keep ideas alive, don't just archive them, make them objective as much as possible. • Distribution of information about those who know, i.e. the professionals in the most important issues	Dissemination
• The freedom to experiment, main samples, prototype, models, guidelines, or good ideas that are successful or brilliant	Application

Source: Gloet and Terziovski, 2004

3. Results

3.1 Descriptive Results

According to the sample size (278 subjects) and by using Morgan Table, 269 questionnaires were ultimately returned and analyzed. The descriptive results are as the following:

The majority of the respondents (51%) are aged 30-40. 60% of the respondents are male and the rest are female. 45% of the respondents have bachelor degree and then the highest frequency is related to the master degree (24%). 32% of the participants have 5-10-year job experience and 27% have job experience of above 15 years. Among the staff who answered the questionnaires, 4% of the staff were in charge of office work, 33% were working as expert, 20% were in charge of management, and 1% working as deputy.

3.2 Inferential results

Before evaluating the structural equation model, it is necessary to examine the significant factor loading of different structures of the questionnaire in anticipating the items to ensure the fitness of measuring models and acceptability of their indices in measuring the structures. This was done using confirmatory factor analysis (CFA) in PLS software. According to the fitted CFA model in Table (5), the weight factor of codes 5 and 7 (process innovation) was not significant at 5% level. Although codes 7 (knowledge creation), 14 (knowledge sharing), and 6 (process innovation) were significant, the compound reliability removed the relevant structure from the acceptable range (CR>6). Therefore, these five items were discarded from the analysis process and the other items with the weight factor of less than .5 remained in the research model with regard to the acceptable range of the compound reliability of the relevant structure. Thus, the convergent validity of the assessment tool is confirmed. According to Table (6), the correlation between two structures is less than .9, so the lack of overlap in the form of discriminant validity is confirmed and consequently the validity of the model structure is approved. Thus, the measurement model of the research is generally accepted.

Table 5. The results of confirmatory factor analysis (CFA) for the items of the questionnaire

Compound reliability	Significance	Factor loads	Code	Structure	Compound reliability	Significance	Factor loads	Code	Structure
	.000	.493	KM23	Knowledge storage	.869	.000	.788	KM1	Knowledge creation
	.000	.609	KM24			.000	.595	KM2	
	.000	.613	KM25			.000	.668	KM3	
	.000	.680	KM26			.000	.370	KM4	
	.000	.629	KM27			.000	.766	KM5	
.796	.000	.517	KM28	Knowledge acquisition		.000	.728	KM6	
	.000	.731	KM29			.023	.150	KM7	
	.000	.621	KM30		.838	.000	.522	KM8	Knowledge sharing
	.000	.598	KM31			.000	.683	KM9	
.813	.000	.701	I 1	Process innovation		.000	.866	KM10	
	.000	.759	I 2			.000	.684	KM11	
	.000	.794	I 3			.000	.244	KM12	
	.000	.533	I 4			.000	.491	KM13	
	.127	-.103	I 5			.000	.250	KM14	
	.023	-.153	I 6		.828	.000	.386	KM15	Knowledge application
	.164	.093	I 7			.000	.455	KM16	
.601	.000	.300	I 8	Service innovation		.000	.544	KM17	
	.000	.435	I 9			.000	.750	KM18	
	.000	.549	I 10			.000	.786	KM19	
	.000	.526	I 11			.000	.694	KM20	
	.000	.301	I 12		.813	.000	.303	KM21	

						.000	.515	KM22	

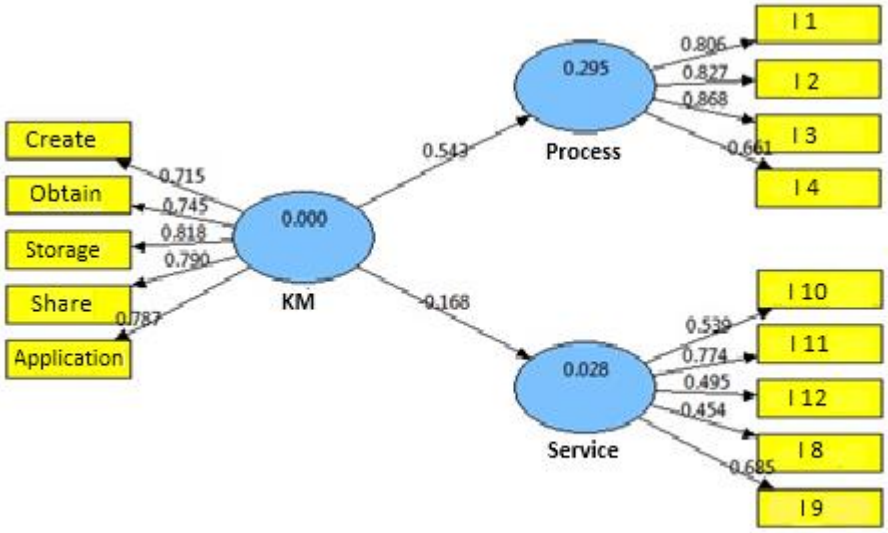
Table 6. Correlation matrix of the main aspects of the research model for the discriminant validity of research tools

Component	Knowledge creation	Knowledge sharing	Knowledge application	Knowledge storage	Knowledge acquisition	Process innovation	Service innovation
Knowledge creation	1.000						
Knowledge sharing	.777	1.000					
Knowledge application	.730	.787	1.000				
Knowledge storage	.635	.739	.843	1.000			
Knowledge acquisition	.488	.735	.524	.739	1.000		
Process innovation	.455	.290	.474	.725	.690	1.000	
Service innovation	- .332	- .109	- .273	- .127	- .132	.009	1.000

3.3 Fitting Structural Model

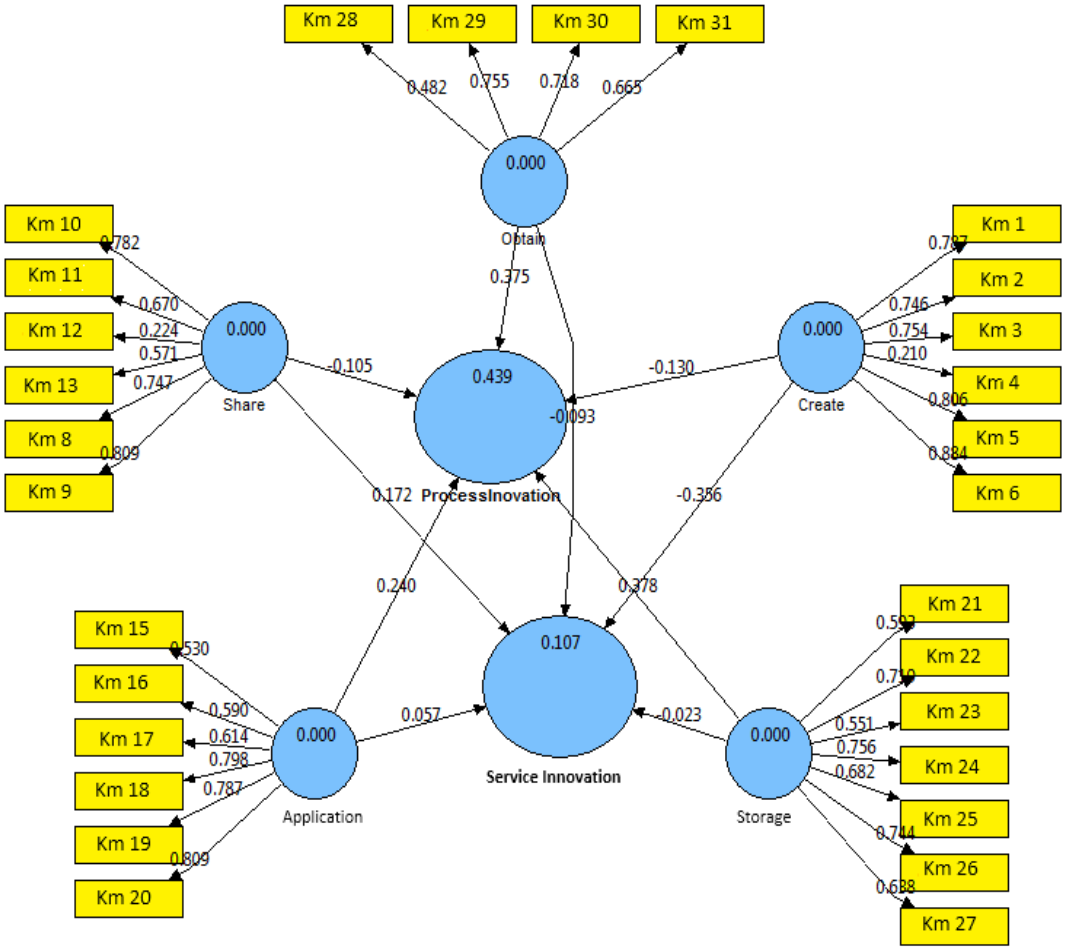
After analyzing the measurement model, in this section the structural model is examined. In fact, the second step of Hulland method is the use of path analysis, coefficient of determination, and the model fitness index. In path analysis, the relationship between variables flows in one direction and will be considered as distinct paths. Path analysis concepts are best explained through its main feature, i.e. the path diagram that reveals the possible causal links between variables. Figures 1 and 2 display the structural equations and the path diagrams of the research model.

Figure (1). Structural equation model of the research main hypotheses



Source: Research Findings

Figure (2). Structural equation model of the research main hypotheses



Source: Research Findings

3.4 Coefficient of Determination

According to Figures (1 and 2) the coefficient of determination of the fitted models of the research are shown in Table (5). Accordingly, in the main model about 25% of the changes of process innovation variable and 47% of the changes of service innovation variable are influenced by the knowledge management and the rest are the factors that are not considered in the model. Meanwhile, the coefficients of determination in the secondary model of the research can be observed in Table (7) with regard to the aspects of knowledge management.

Table 7. Coefficient of determination of dependent variables of research models

Model	Variable	R^2
Main	Process innovation	.249
	Service innovation	.473
Secondary	Process innovation	.439
	Service innovation	.107

Source: Research Findings

3.4.1 Model Fitting Index

Generally, in PLS there are fitness index Q^2 and goodness-of-fit (GOF) index. For Q^2 index the values more than 0. 35 are good fitness, between .15 to .35 are medium fitness and less than .15 show low fitness. For the goodness of fit index as the value is more than .5 and closer to 1 the fitness is more perfect (Fernandez[5], 2012). Table 8 shows the indices for the dependent variables of the research. With regard to the value of these indices the two models of the value have moderate fitness.

[5]. Fernandes, V. (2012). (Re) discovering the PLS approach in management science. Management; 15(1): 101-123

Table 8. Fitness indices of research Model

Model	Variable	χ^2	oF
Main	Process innovation	161	.395
	Service innovation	156	.372
Secondary	Process innovation	277	.526
	Service innovation	037	.197

Source: Research Findings

3.5 Examining Research Hypotheses

In order to test the research hypotheses Student's t-test has been used in structural equation modeling. If the value of t is more than 1.96, the related hypothesis is confirmed at 5% level of error.

3.6 Research Main Hypotheses

1. Knowledge management affects process innovation in Mashhad Municipality.

2. Knowledge management affects service innovation in Mashhad Municipality.

According to the final fitted model of structural equation of Figure (1) and coefficients of standard theoretical paths (β), the first hypothesis of the research which investigates the direct effect of knowledge management on process innovation was significant at 5% level (β= .499, t =5.759). Therefore, knowledge management has a direct and positive effect on process innovation with 95% probability.

The first and second hypotheses of the research (main hypotheses) investigate the effects of knowledge management on process innovation and service innovation. The first hypothesis is confirmed at .05% level (β= .499, t =5.759), but the second hypothesis is rejected according to beta coefficient (β= -.168, t =1.403). Therefore, knowledge management has no significant effect on service innovation.

3.6.1 Research Secondary Hypothesis

1. Knowledge creation affects process and service innovation in Mashhad Municipality.

The first hypothesis of the research (secondary hypothesis) investigates the effects of knowledge creation on process innovation and service innovation. According to the standard coefficients of (β)-.13 and .356 and the statistics of .956 and 1.961, the first one is significant but the second one is insignificant at 5% level. Therefore, the hypotheses on the effect of knowledge creation on process innovation is not confirmed with 95% probability, but the hypothesis on the effect of knowledge creation on service innovation is confirmed with 95% probability.

2. Knowledge sharing affects process and service innovation in Mashhad Municipality.

The second hypothesis of the research investigates the effects of knowledge sharing on process innovation and service innovation. According to the standard coefficients of

(β)-.105 and .57 and the statistics of .589 and .785 it was not significant at .05% level. Therefore, the second hypothesis of the research on the effect of knowledge sharing on process innovation and service innovation was not confirmed with 95% probability.

3. Knowledge application affects process and service innovation in Mashhad Municipality.

The third hypothesis of the research investigates the effects of knowledge application on process innovation and service innovation. According to the standard coefficients of (β) .240 and .356 and the statistics of 2.113 and .259, the first one is significant but the second one is insignificant at 5% level. Therefore, the hypotheses on the effect of knowledge application on process innovation is confirmed with 95% probability, but the hypothesis on the effect of knowledge application on service innovation is not confirmed with 95% probability.

4. Knowledge storage affects process and service innovation in Mashhad Municipality.

The fourth hypothesis of the research investigates the effects of knowledge storage on process innovation and service innovation. According to the standard coefficients of (β) .378 and -.023 and the statistics of 3.569 and .114, the first one is significant but the second one is insignificant at 5% level. Therefore, the hypotheses on the effect of knowledge storage on process innovation is confirmed with 95% probability, but the hypothesis on the effect of knowledge storage on service innovation is not confirmed with 95% probability.

5. Knowledge acquisition affects process and service innovation in Mashhad Municipality.

The fifth hypothesis of the research investigates the effects of knowledge acquisition on process innovation and service innovation. According to the standard coefficients of (β) .375 and -.093 and the statistics of 2.684 and .501, the first one is significant but the second one is insignificant at 5% level. Therefore, the hypotheses on the effect of knowledge acquisition on process innovation is confirmed with 95% probability, but the hypothesis on the effect of knowledge acquisition on service innovation is not confirmed with 95% probability.

In general, the results of the research hypotheses test are displayed in Table (9):

Table 9. The results of research hypotheses test

Result	t	β	path	Main hypotheses
Confirmed	5.579	.499	process innovation ← Knowledge management	۱
Rejected	1.403	-.168	service innovation ← Knowledge management	۲
Result	t	β	Path	Secondary hypotheses
Confirmed	1.961	.356	service innovation ← Knowledge creation	۱
Rejected	.956	-.13	process innovation ← Knowledge creation	۱
Rejected	.589	-.105	process innovation ← Knowledge sharing	۲
Rejected	.785	.175	service innovation ← Knowledge sharing	۲
Confirmed	2.113	.240	process innovation ← Knowledge application	۳
Rejected	.259	.057	service innovation ← Knowledge application	۳
Confirmed	3.569	.378	process innovation ← Knowledge storage	٤
Rejected	.114	-.023	service innovation ← Knowledge storage	٤
Confirmed	2.684	.375	process innovation ← Knowledge acquisition	٥
Rejected	.501	-.093	service innovation ← Knowledge acquisition	٥

Source: Research Findings

Considering the importance and the effect of each variable of knowledge management on innovation and according to the regression coefficients (β) obtained in the formation of service innovation, the only factor that is important is knowledge creation while in process innovation the first priority belongs to knowledge storage with β=.378, knowledge acquisition with β= .375 is the second priority and ultimately knowledge application with β= .240 is the third priority. On the other hand, as discussed earlier, each one of five levels of knowledge management has various indices (Table 3). In general, in terms of the effect of each item of knowledge management on organizational innovation, at knowledge creation level the highest effect belongs to KM5 (specific mechanism to convert staff implicit knowledge to explicit knowledge) at

Mashhad municipality. At knowledge sharing level the highest effect belongs to KM9 (encouraging individuals to share their knowledge). At knowledge storage level the highest effect belongs to KM25 (documentation and maintenance of project-related information) at Mashhad municipality. At knowledge application level the highest effect belongs to KM20 (use of knowledge to solve most of organizational problems) and finally at knowledge acquisition level the highest effects belongs to KM29 (encouraging employees to find alternative solutions to performing the assigned duties in organization).

4. Results and Discussion

At present time, taking advantage of information and knowledge management has become an important opportunity for the survival of dynamic and innovative organizations. It is not exaggerating if we consider knowledge as the essential element of organizational capital (Safarzade et al., 2012). Therefore, alert management tries to use a tool called knowledge more and more to face and conflict uncertainty, keep status, and make creativity and innovation to expand competitive arena. It requires that organizations respect knowledge management be aware of its effects on corporate innovation and place it in their preferred procedures as an essential need to pioneer in competitive arena (Weisberg, 2006). The present research was carried out on modeling the effect of knowledge management and its components on innovation in the offered services to citizens and also innovation in servicing process. The results indicate the direct effect of knowledge management on innovation in servicing process. However, knowledge management does not affect the services offered to the citizens. In other words, in service organization of Mashhad municipality, knowledge management has a direct and positive effect on the process and the way of offering services. When it is said that an organization has innovation in process of offering services it means that "the organization is willing to support new ideas and creativity for development of new processes" (Vaccaro et al., 2010). However, according to the research results, knowledge management can't be sought in innovation in identity and the kind of services offered to citizens. In other words, knowledge management can affect the way and the rate of offering services, but it can't affect the type of services offered to the citizens. At the next level, the effect of each one of five levels of knowledge management on process innovation and service innovation was measured. The research hypotheses indicate the positive and direct effect of knowledge management on two levels of innovation at Mashhad municipality service organization except the effect of knowledge creation and knowledge sharing on process innovation, knowledge sharing on service innovation, knowledge application on service innovation, knowledge storage on service innovation, and knowledge storage and acquisition on service innovation. Another important result is the lack of relationship between knowledge sharing and process innovation and service innovation, while the results of other studies (Darroch, 2005; Kohestani, 2007) indicate the direct and positive relationship between knowledge sharing and corporate innovation. On the other hand, among the items forming five levels of knowledge management, at knowledge creation level the highest effect belongs to KM5 (specific mechanism to convert staff implicit knowledge to explicit knowledge) at Mashhad

municipality; at knowledge sharing level the highest effect belongs to KM9 (encouraging individuals to share their knowledge); at knowledge storage level the highest effect belongs to KM25 (documentation and maintenance of project-related information) at Mashhad municipality; at knowledge application level the highest effect belongs to KM20 (use of knowledge to solve most of organizational problems) and finally at knowledge acquisition level the highest effects belongs to KM29 (encouraging employees to find alternative solutions to performing the assigned duties in organization).

Generally, it should be said that the municipality always needs to be innovative in servicing process as an independent institution in urban development by enhancing and nurturing knowledge within the organization and using knowledgeable forces. It is very important for an organization to offer new and updated services and according to the demands of the target customers; however, with regard to the nature of municipality, which is one of the service organizations, application of knowledge management system in the way and process of offering services to citizens is of greater importance.

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