

Investigating the Relationship between Information Technology Maturity and Knowledge Management Maturity: A Case Study of the Tehran Municipality

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ABSTRACT

Objective: The purpose of this study was to investigate the relationship between the maturity level of information technology and the maturity level of knowledge management in Tehran Municipality.

Methods: The current research was applied in terms of purpose and survey research in terms of method. The statistical population of this research was experts and specialists in the field of information technology and knowledge management in Tehran Municipality. Considering the specialization of the subject, and the number of experts in the fields of information technology and knowledge management, 31 experts in the field of urban management were asked to answer the questionnaires. In this research, to measure the maturity level of information technology and maturity of knowledge management, two standard questionnaires of the maturity level of the Gartner information technology management process and the maturity level of knowledge management from the standard questionnaire of the knowledge management evaluation tool were used. In this research, data analysis was done using SPSS software (version 22).

Results: The research indicated that in the maturity of information technology, the level of leadership and information technology management activities in Tehran Municipality, the readiness of customer-oriented service agents, control and evaluation, configuration and asset management, security management, change management, service level management, Accessible management, service and support documentation, capacity management and strategic orientations are in good condition and other components are below 3 average levels. Also, the results in the knowledge management maturity section indicated that in the areas of searching for ideas in all places by organization members, creating marketing strategies and selling the organization's knowledge assets, using learning to support the organization's core competencies, flexibility, and willingness to innovate as The drivers of the learning process were the employees' responsibility for their learning, connecting the organization's members and the external communities by technology, and the rapid availability of technology to the employees. Also, the research results showed that there is no significant relationship between the maturity of information technology management and knowledge management.

Conclusion: The results of the research showed that, in general, the maturity of information technology management of Tehran Municipality is at a favorable level, but the maturity level of knowledge management of Tehran Municipality has an unfavorable situation. In the end, suggestions were made to improve the situation.

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Introduction

Increasing competition, higher levels of performance, and globalization are the changes that organizations are facing today. Organizations have to continuously reorganize themselves and in the meantime transform the task hierarchy into flexible and high-performance network organizations (Kareemi, 2014). To manage these challenges, organizations need to consider information technology as an important factor not only to increase efficiency and effectiveness but also to respond quickly and consistently to customer needs and competitive pressure, from products and services based on information technology. Also, communication based on information technology with customers, suppliers, and other stakeholders should be used (Dalavi, Salahian & Ganji, 2014). On the other hand, with the emergence of knowledge as a strategic resource for organizations in the present era, researchers are searching for guides on how to collect effectiveness of knowledge resources and manage them for competitive advantage (Hasanqalipour, Abedi Jafari & Khatibiyan, 2013).

Knowledge management can be achieved by integrating the knowledge capital of organizations in different departments and directly affecting concepts such as customer orientation, organizational learning, organizational cultural promotion, leadership and intelligent decision-making, process redesign, new knowledge generation, and the transformation of subjective and implicit knowledge into knowledge. It should be documented and clearly bring about the improvement of the level of activities and the achievement of the desired goals (Kibedeh, 2010). Organizations cannot benefit from these functions without having a knowledge management implementation platform, and effective policies should be developed in this regard (Zhou & Kvados, 2012). Information and communication technology plays an important role in the circulation and sharing of knowledge and information in the organization. Organizations that perform at a high level achieve significantly higher returns on IT investments than their competitors (Azhu et al., 2013). Organizations with more than average information technology governance that pursue a specific and similar strategy such as customer intimacy have a profit of more than 20% compared to organizations with poor information technology governance that pursue a similar strategy (Simonson & Johnson, 2008). Therefore, it is important to identify how information technology affects the components and processes of the organization.

The role of information technology in today's organizations is so prominent that many theoreticians, managers, and decision-makers of the organization recommend adopting a strategy related to this technology in future directions of organizations (Pourkiani and Farah Bakhsh, 2014). Information technology, as a linker, uses all modern sciences to provide the information needed by industry experts, organizations, and finally all people in different parts of society in the shortest possible time (Mehrkam, 2020).

The increasing attention to knowledge management has led to a plethora of organizational knowledge measures in the business world. Among these measures is the use of information technologies to manage knowledge resources throughout the organization. Creating a knowledge management system or knowledge-based systems with database, communication, and intelligent systems technologies are common examples of applying information technologies. Simply put, information technology and knowledge management are essential components for success in today's dynamic business environment. Achieving an objective assessment of the organization's maturity status in the field of information technology and knowledge management is essential. For every aspect of information technology and knowledge management of the organization, questions such as what should be measured and how, and what this measurement should be compared with, are raised so that the current state of the organization in these two areas is examined and a certain degree of maturity in each of the fields should be assigned to the organization. Therefore, the purpose of this research was to investigate the relationship between the maturity of knowledge management and the maturity of information technology in the Tehran Municipality. According to the studies carried out so far, studies have been conducted on the relationship between the maturity of knowledge management and information technology management, some of which are mentioned below:

Sarkohi and Henry (2014) in a study on information systems, decision-making and knowledge management in selected sports organizations, the results show that there is a positive and significant relationship between the components of information systems and decision-making with knowledge management and selected sports organizations. Also, the multiple regression coefficients indicate that the components of platinum devices and decision-making predict benefits for knowledge management. The results show that currently their organizations pay little attention to information devices and the need to be equipped with modern technologies is felt.

Masrouf et al. (2015) investigated the relationship between quality knowledge management of employee services and the mediating role of employee creativity in the General Department of Culture and Islamic Guidance of Golestan province; To analyze the data, descriptive statistics including mean, standard deviation, and standard deviation and inferential statistics were performed using Lisrel software. The findings of this research showed that the acquisition of knowledge has a significant relationship with the creativity of employees. Knowledge organization has a significant relationship with employees' creativity. Knowledge dissemination has a significant relationship with employees' creativity. Acquiring quality knowledge of employee services has a significant relationship. Organization of high-quality knowledge of employee services has a significant relationship. Dissemination of quality knowledge of employee services has a significant relationship. The creativity of employees plays a mediating role in the relationship between knowledge management and employee service quality.

Karimi (2015) in a research titled investigating the impact of information technology on knowledge management (a case study of the employees of the supply organization Sociology, Ilam branch) investigated the impact of information technology on knowledge management. The results of his research showed that there is a significant relationship between information technology and knowledge management variables (knowledge acquisition, knowledge organization, knowledge sharing, and knowledge application).

Delavi, Salamian, and Ganji (2015) investigated the use of information technology in one of the most important areas of health and treatment in a study entitled "The impact of information technology on the organizational maturity levels of government and non-government hospitals in Isfahan city in 2014". The results of the research showed that information technology activities can lead the organization towards a mature organization and play an effective role in supporting, innovating, and improving the organization in a research entitled "Investigating the effect of knowledge sharing on learning, innovation and organizational performance" studied the managers, engineers, and experts of the Mashhad Water and Sewerage Company with a statistical sample of 320 people. The research findings showed that knowledge sharing has a positive effect on learning, innovation, and organizational performance. Also, open knowledge sharing has a greater impact on financial performance, and tacit knowledge sharing has a stronger impact on operational performance.

Khadivar and Abbasi (2016) assessed the maturity level of knowledge management in 300 Iranian companies using the American Productivity and Management Center model. In this research, the examination of the maturity dimensions of knowledge management showed that the factors of culture, technology, process, leadership, and evaluation are in a better condition. Organizations related to oil and gas and petrochemical industries, banks and insurance and investment institutions, and other manufacturing companies are in the third level of knowledge management maturity, and engineering companies are in the second level, i.e. developed.

Maleki and Lotfi (2016) in the study of the level of knowledge management of Imam Ali Officer University (AS) found that this university does not have a favorable situation in any aspect of knowledge management and relatively the application of knowledge has the best situation. In their research, Ardalan et al. (2017) identified eight tools for marketing, fourteen tools for risk management, fifteen tools for customer orientation, and eight tools for the bank's human resources. Based on this model, fourteen knowledge management infrastructures can facilitate the knowledge management cycle in four areas.

Mohammadi Moghadam et al. (2018) investigated the relationship between knowledge management ability and the new product development process in a food industry company and found that the relationship between knowledge management ability and new product development is a positive and meaningful relationship. Also, the findings of this research

confirmed the existence of a relationship between knowledge management ability and customer knowledge and a significant relationship between customer knowledge and new product development.

Isak Wafelhan and Deminik (2011) investigated the role of knowledge management as a facilitator in the growth of entrepreneurship in the organization and came to the conclusion that the amount of knowledge management that is supported by culture is positively related to the degree of people's involvement in innovation and the degree of people's tendency to take risks. And the ability to engage people to renew the strategic plan is related. Also, the level of knowledge management that is supported by the organizational structure is positively related to the level of people's involvement in innovation and the level of people's tendency to risk and the ability of people's involvement to renew the strategic plan.

Mostafapour, Rezaei and Hosseini Qaboosi (2012) in a research entitled "Use of information technology and its role in the success of entrepreneurs" there is a significant relationship between information technology and the success of entrepreneurs. Every entrepreneur must have knowledge about the environment and suitable solutions to meet the needs and information technology brings great changes in all activities.

In 2014, Shah conducted a research entitled: The effect of management information system in school administration, in which the effect of using management information devices in school administration was investigated. The findings of the research showed that the information system has a positive and significant effect on many tasks of managers and employees such as: leadership, decision-making, workload, human resource management, communication, organizational accountability and planning.

Lin (2014) studied 244 managers, who were directly responsible for activities related to knowledge management in large Taiwanese companies, and concluded that both knowledge compilation strategy and knowledge personalization strategy in knowledge management have positive effects on stage development. Management has knowledge; But their importance is different in different subgroups.

Rodrigo and Gonzalez (2014) studied 78 companies in the Brazilian automobile industry and identified eight background factors affecting knowledge management, including problem solving and continuous improvement, learning and teamwork culture, proactive organizational structure, common identity and basic knowledge, absorption capacity. They identified knowledge, preparation of competence map and its evaluation and development, innovative strategy and information system. Szygilska (2014) in her research titled "Methods and technologies to support information and knowledge management in the Polish police" concluded that the knowledge and information management computer system is an important support for police activities and plays

an important role in creating an intelligent organization and It supports its activities to provide effective public services and help create a knowledge economy at the national level.

Perez-Mendez and Machado-Cabzas (2015) have conducted a research entitled: The relationship between management information system and company performance. In this research, the relationship between management information system and financial performance of Spanish companies was investigated. The findings of the research showed that there is a positive and significant relationship between the management information system and the performance of the company, and investing in the quality and strategy of information devices and the costing system has a positive effect on improving the profitability of companies.

Seba and Rowley (2015) by examining Che studied the British Police Center and found that although the importance of knowledge sharing in the successful implementation of tasks is widely considered in any of the studied organizations, there is no knowledge management strategy or policy encouraging knowledge sharing and the organizations studied in the field Encouraging knowledge sharing faces problems due to the culture, size of the organization and attention to the value variable of knowledge management.

Lee (2017) investigated the enablers and process of knowledge management in South Korean hospital organizations. The results showed that organizational factors affect the knowledge management process in each hospital in a different way. Heyman et al. (2017) in their research analyzed an open source online database in the field of agriculture by examining the results of using this database. The research results identified the barriers to participation and weak points of interaction and opportunities to improve agricultural knowledge management and their good ability to evaluate information.

The relationship between information technology and knowledge management, which results from the cycle of data to information and information to knowledge, is a subject to consider. Due to the fact that information technology enables better and easier management of knowledge, often, information technology systems are considered as knowledge management systems. Therefore, in organizations that use information technology and knowledge management as competitive tools, it is necessary to check the maturity level of these two important areas of measurement and the relationship between them in order to achieve optimal use of the investments made in them reasonable (Binesh & Diehim, 2015).

Examining the relationship between information technology and knowledge management is of great importance that has not been addressed much. The relationship between information technology and knowledge management, especially maturity, is a debatable issue. Previous studies state that although knowledge management is strongly based on information technology, in the literature sources, information technology as a prerequisite and enabler of knowledge

management "what cannot be measured cannot be managed" has been addressed to a very small extent. Is. According to the phrase, the importance of research on measuring the maturity of information technology and the maturity of knowledge management is revealed. In fact, measurement is a prerequisite for improvement. This also applies to an organization's IT and knowledge management capabilities. Considering the importance of assessing the maturity level of information technology and knowledge management in the organization, the research objectives are:

1. Evaluation and measurement of the maturity level of information technology in Tehran Municipality;
2. Evaluation and measurement of the maturity level of knowledge management in Tehran Municipality; and
3. Investigating the relationship between the maturity level of information technology and the maturity level of knowledge management in Tehran Municipality.

Research Questions

The questions of this research are:

1. What is the maturity of information technology in Tehran Municipality?
2. What is the maturity of knowledge management in Tehran Municipality?

Research Assumptions

There is a significant relationship between the maturity of information technology and the maturity of knowledge management in Tehran Municipality.

Materials and Methods

The current research was applied in terms of purpose and survey research in terms of method. In the current research, the statistical population of the research included 31 specialists in the field of knowledge management and information technology management active in the field of urban management and knowledge management. In this research, the maturity of information technology was investigated from the aspect of the maturity of the information technology management process. To evaluate the maturity of the information technology management process using a standard questionnaire designed based on Gartner's information technology management process maturity model; used. This questionnaire evaluates 4 main criteria and 33 factors to determine the maturity of the IT management process. To describe the situation of each of the factors, there are 5 descriptive options that follow the logic of the Likert scale so that the first option expresses the most unfavorable situation and the fifth option expresses the most favorable situation for the investigated factor. To convert the respondents' qualitative opinions into quantitative numbers that can be understood by the software, in accordance with the 5-point Likert scale, the first to fifth options of the numbers 1 (indicating a very unfavorable condition of the investigated agent) to 5 (indicating a very favorable condition of the investigated agent)

given. Also, the standard knowledge management evaluation tool was used to evaluate the maturity of knowledge management. The knowledge management assessment tool is a questionnaire without additional information about the sample size. The questionnaire is highly structured and has a section for each of the four enablers. Within each of these sections 4 to 6 statements such as "Employees take responsibility for their own learning", and "Technology brings the organization closer to customers" should be judged in terms of performance. That is, the respondent must judge how well the organization fulfills the expressed statement. This tool evaluates the maturity of knowledge management with 5 criteria and 24 factors. The scale for measuring the status of the factors raised in each of the questions is a five-point Likert scale with a rating of (1 = very unfavorable condition of the investigated factor = 5 = very favorable condition of the investigated factor).

In the current research, to measure the validity of the tool, the questionnaire was provided to 7 experts in the field of information technology and knowledge management of Tehran Municipality and professors in the field of information technology. The work process was such that the research tools were sent to the experts and they were asked to examine the application of the tools from the two dimensions of communication with the Tehran Municipality and the ability to answer the questions and assumptions of the research according to the conditions of Tehran Municipality and the current research. After collecting the experts' opinions, the necessary modifications were made to the tools; Then, the tool was re-evaluated with two methods of scoring the relationship between the questionnaire questions and research objectives and the clarity of the questions, and finally, the validity of the tool was confirmed by experts.

In addition, in the present study, Cronbach's alpha was calculated after collecting the data for all three questionnaires. Cronbach's alpha for the information technology management process maturity assessment questionnaire was equal to 0.83; Also, Cronbach's alpha for preparation level, tool levers, support and delivery service process, and policies and documentation were equal to 0.85, 0.89, 0.79, and 0.82, respectively. Cronbach's alpha coefficient for the knowledge management maturity evaluation questionnaire was equal to 0.84. Also, for the sub-criteria of the knowledge management process, leadership in knowledge management, culture of knowledge management, technology of knowledge management, and measurement of knowledge management were equal to 0.89, 0.75, 0.86, 0.85, and 0.83 respectively.

Results

In the current research, questionnaires were provided to 31 specialists in the field of urban management. To verify the validity of the tool, the questionnaire was given to 7 experts in the field of information technology and knowledge management of Tehran Municipality and professors in the field of information technology. The work process was such that the research

tools were sent to the experts and they were asked to examine the application of the tools from the two dimensions of communication with the Tehran Municipality and the ability to answer the questions and assumptions of the research according to the conditions of Tehran Municipality and the current research. After collecting the experts' opinions, the necessary modifications were made to the tools; Then, the tool was re-evaluated with two methods of scoring the relationship between the questionnaire questions and research objectives and the clarity of the questions, and finally, the validity of the tool was confirmed by experts. After verifying the validity of the questionnaire, it was given to 31 experts in the field of urban management in person. After removing distorted questionnaires and discarding incomplete questionnaires, 27 questionnaires were entered into SPSS software and analyzed according to the research objectives. Demographically, 13 respondents were male and 14 were female. In terms of education level, 15 specialists had bachelor's degrees, 7 had master's degrees, and 5 had doctor's degrees. In terms of work experience, 10 of the respondents had more than 10 years of work experience, 12 of the respondents had 5 to 10 years of work experience, and 5 of the respondents had 3 to 5 years of work experience.

Research Question 1. What is the maturity of information technology in Tehran Municipality?

In order to determine the favorable or unfavorable status of each of the factors and criteria evaluated in Gartner's information technology management process maturity evaluation questionnaire, the assumption test for the average population (one-sample t-test) has been used. The statistical hypothesis of population mean is defined as follows in Table 1.

Table 1. Definition of statistical hypotheses and conditions for accepting hypotheses

Statistical hypothesis	Acceptance condition	Description	The status of the criterion under review
$H_0: \mu_x=3$	$P>0.05$		Undesirable
$H_1: \mu_x \neq 3$	$P<0.05$	If the upper and lower limits are both positive, then the assumption is greater than 3.	Optimal
		If the upper and lower limits are both negative, then the assumption is smaller than 3	Undesirable
		If the lower limit is negative and the upper limit is positive, then the assumption is equal to 3.	Undesirable

To answer the first question of the research, the data obtained from the questionnaires for evaluating the maturity of the information technology management process were analyzed. One-sample t-test was used to determine the favorable or unfavorable status of Tehran Municipality.

Table 2. Evaluation of the maturity of information technology in Tehran Municipality according to sub-criteria by using sample T-Tech test

	Agents	Number	Mean	Standard deviation
Level of preparation	Information technology management activities in Tehran Municipality	27	3.98	1.015
	operation management	27	2.32	0.845
	Customer-oriented service	27	3.27	0.830
	Human resources management	27	2.25	0.250
	Supplier management	27	2.1	0.001
	Introduction, provision, and dissemination of information technology services	27	2.2	0.910
Tool levers	Control and evaluation	27	3.27	0.512
	Problem tracking systems	27	3.34	0.152
	Asset management	27	3.42	0.172
	Infrastructure assessment and testing	27	2.47	0.021
	Security management	27	3	1.447
support delivery	Management of events and events	27	2.5	0.435
	Change management	27	3.05	0.258
	Copy management	27	2.12	0.445
	Service level management	27	4.26	0.478
Service and process	Accessible management	27	3.62	0.460
	Capacity management	27	3.16	0.241
	Information security management	27	2.18	0.253
Policies and	Service and support documentation	27	4.12	0.001
	Quality requirements and commitments and policies	27	2.18	0.154
	Strategic trends	27	3.27	0.183

Considering that the average limit was considered to be three in the current research (Rostami Majin, 2016; Sadeghi & Mousavian, 2013; Barqaei, Saatian, & Mohammadyari, 2019), therefore it is clear that the level of leadership and information technology management activities in Tehran Municipality, The readiness of customer-oriented service agents, control and evaluation, configuration and asset management, security management, change management, service level management, accessible management, service and support documentation, capacity management and strategic trends have a good status and other components are lower. Out of 3 are average. To check the general condition of each department, the average of various factors was evaluated. The results are shown in Table 3.

Table 3. Evaluation of Information Technology Maturity in Tehran Municipality according to the main criteria using a sample T-Tech test

Criteria	Number	Mean	Standard deviation
Level of preparation	27	2.68	0.312
Tool levers	27	3.1	0.298
Service support and delivery process	27	3	0.315
Policies and documentation	27	3.19	0.317

As it is clear from Table 3, in the sections of instrumental levers, the process of support and delivery services and the policies and documentation of the Cultural and Information Institute of

Tehran Municipality are in a favorable condition. To measure the general state of information technology maturity in Tehran Municipality, the average of all sections of the questionnaire was evaluated. The results are presented in Table 4.

Table 4. Evaluation of information technology maturity in Tehran Municipality using a sample T-Tech test

Criteria	Number	Mean	Standard deviation
Level of preparation	27	3.02	0.302

The results of Table 4 indicate that the technology maturity level in Tehran Municipality is higher than number 3. Therefore, an inferential test was used to determine the general situation and determine the favorable or unfavorable level of each of the criteria. The result of the inferential test for each of the investigated sub-criteria can be seen in Table 5.

Table 5. Inferential statistics related to the community average test for the examined criteria

Inferential test						
Criteria	The test value is equal to 3					
	T	Degrees of freedom	P	Mean difference	95% confidence interval for the difference	
					lower limit	upper line
Level of preparation	0.81	26	0.424	0.052	-0.08	0.18
Tool levers	-8.610	26	0.0001	-0.516	0.64	0.39
Service support and delivery process	20.526	26	0.0001	0.528	0.48	0.58
Policies and documentation	-2.941	26	0.006	-0.177	0.30	0.05

As it is clear from Table 5, and according to Table 1, in the sub-criterion of readiness level, because the pi value is greater than 0.05, therefore, the state of maturity of information technology process management in this sub-criterion was evaluated as unfavorable. But in the sections of instrumental levers, the process of support and delivery services, and policies and documentation, since the value of pi is less than 0.05 and both the upper and lower limits are positive, the status of these three sub-criteria was evaluated as favorable. To check the overall state of maturity of the information technology management process, the results of the checks for the entire calculation are presented in Table 6.

Table 6. Inferential statistics related to the community average test for the maturity of the information technology management process

Inferential test						
Criteria	The test value is equal to 3					
	T	Degrees of freedom	P	Mean difference	95% confidence interval for the difference	
					lower limit	upper line
Maturity of information technology management process	-0.682	26	0.0001	-0.028	0.11	0.06

Table 6 shows that the value of π in the maturity of the knowledge management process of Tehran Municipality is less than 0.05 and both the lower limit and the upper limit are positive, so the state of maturity of information technology processes was evaluated as optimal. In Table 7, the findings about the status of the investigated factors in evaluating the maturity of the information technology management process are presented.

Table 7. The status of the investigated factors in evaluating the maturity of the information technology management process

Agents		Condition
Level of preparation	Leadership and information technology management activities in Tehran Municipality	Optimal
	operation management	Undesirable
	Customer-oriented service	Optimal
	Human resources management	Undesirable
	Supplier management	Undesirable
	Introduction, provision, and dissemination of information technology services	Undesirable
Tool levers	Control and evaluation	Optimal
	Problem tracking systems	Optimal
	Configuration and asset management	Optimal
	Infrastructure assessment and testing	Undesirable
	Security management	Optimal
Service support and delivery process	Management of events and events	Undesirable
	Change management	Optimal
	Copy management	Undesirable
	Service level management	Optimal
	Accessible management	Optimal
	Capacity management	Optimal
Policies and documentation	Information security management	Undesirable
	Service and support documentation	Optimal
	Quality requirements and commitments and policies	Undesirable
	Strategic trends	Optimal

As it is clear from Table 7, Tehran Municipal Information Cultural Institute has favorable status in 12 sub-criteria and unfavorable status in 9 sub-criteria.

Research Question 2. What is the maturity of knowledge management in Tehran Municipality?

The second research question was to investigate the maturity level of knowledge management in Tehran Municipality. To determine the status of Tehran Municipality in knowledge management maturity, a knowledge management maturity evaluation questionnaire was used. The results are presented in Table 8.

Table 8. Assessment of maturity of knowledge management in Tehran Municipality by micro-criteria using sample t-tech test

Agent		Number	Mean	Standard deviation
Knowledge management process	Systematic identification of knowledge gaps.	27	2.03	0.875
	Creating a smart, complex, and ethical mechanism for gathering knowledge.	27	2.68	0.761
	Search for ideas in all places by members of the organization.	27	3.28	0.591
	Formalizing the transfer process of the best business examples.	27	2.45	0.932
	Transfer of tacit knowledge throughout the organization.	27	2	1.025
Leadership in knowledge management	The central role of knowledge management in the organization's strategy.	27	2.69	0.961
	Creating marketing strategies and selling the organization's knowledge assets.	27	3	0.845
	Using learning to support the organization's core competencies.	27	3.23	0.759
	Recruitment and evaluation of organization people based on the level of participation in the development of organizational knowledge.	27	2.12	0.788
Culture of knowledge management	Encouraging and facilitating knowledge sharing by the organization.	27	1.94	0.963
	There is an atmosphere of trust and an open atmosphere in the organization.	27	2.22	0.951
	Creating value for the customer is the main goal of knowledge management.	27	1.76	0.677
	Flexibility and willingness to innovate as drivers of the learning process	27	4.68	0.945
	Employees are responsible for their learning	27	3.63	0.756
Knowledge management technology	Connecting organization members and external communities through technology.	27	4.68	0.789
	Creating an organizational memory accessible to the entire organization through technology.	27	2.53	0.637
	Bringing the organization closer to customers through technology.	27	1.56	0.943
	Cultivation of human-centered information technology by the organization.	27	2.96	0.728
	Rapid access to technology for employees.	27	3.32	0.736
	Existence of timely, integrated, and intelligent information systems in the organization.	27	2.30	0.763
Measurement of knowledge management	Inventing ways to relate knowledge to financial results by the organization.	27	1.90	0.790
	Creating a set of indicators to manage knowledge by the organization.	27	2.45	0.961
	There is a balance between the set of hard and soft indicators and the financial and non-financial indicators of the organization.	27	2.03	0.875
	Allocating resources to efforts that increase the organization's knowledge base.	27	2.29	0.902

Table 8 indicates that the average readiness and maturity of knowledge management in Tehran Municipality in the areas of searching for ideas in all places by members of the organization, creating marketing strategies and selling the knowledge assets of the organization, using learning to support the core competencies of the organization, flexibility and willingness Innovation as drivers of the learning process, employee responsibility for their learning, connecting organization members and external communities by technology, and the rapid provision of technology to employees are above number 3 and the average level. To check the maturity status of knowledge management in each of the main departments of Tehran Municipality, it is presented in Table 9.

Table 9. Evaluation of the maturity of knowledge management in Tehran Municipality according to the main criteria using a sample T-Tech test

Criteria	Number	Mean	Standard deviation
Knowledge management process	27	2.48	0.572
Leadership in knowledge management	27	2.76	0.622
Culture of knowledge management	27	2.84	0.538
Knowledge management technology	27	2.89	0.646
Measurement of knowledge management	27	2.16	0.424

As it is clear from Table 9, the average is lower than the average in all criteria. Therefore, to determine the level of knowledge management maturity of Tehran Miangan Municipality, the above 4 components were calculated and evaluated. The results are presented in Table 10.

Table 10. Evaluation of knowledge management in Tehran Municipality using a sample T-Tech test

	Number	Mean	Standard deviation
Maturity of knowledge management	27	2.62	0.517

Table 10 reveals that the average knowledge management in Tehran Municipality is lower than the average (number 3). Therefore, an inferential test was used to determine the overall situation and determine the favorable or unfavorable level of each of the criteria. The result of the inferential test for each of the investigated sub-criteria can be seen in Table 11

Table 11 inferential statistics related to the community average test for the examined criteria

Criteria	Inferential test					
	The test value is equal to 3					
	T	Degrees of freedom	P	Mean difference	95% confidence interval for the difference	
				lower limit	upper line	
Knowledge management process	7.786	26	0.083	-0.903	-1.11	-0.69
Leadership in knowledge management	-5.439	26	0.124	0.718	-0.95	0.49
Culture of knowledge management	-0.812	26	0.0001	-0.561	0.76	-0.26
Knowledge management technology	0.139	26	0.0001	0.016	-0.25	0.22
Measurement of knowledge management	-7.414	26	0.869	-0.831	-1.06	0.60

As it is clear from Table 11 and according to Table 1-4 under the criteria of the knowledge management process, leadership in knowledge management and measurement of knowledge management because the value of the significance level is greater than 0.05, therefore the maturity status of knowledge management in the cultural institution It is undesirable for Tehran Municipality to notify each of these sub-criteria. Also, in the sub-criteria of knowledge management culture and knowledge management technology, although the value of the significance level is less than 0.05, because both the lower limit and the upper limit are not the same sign, therefore the maturity status of knowledge management in Tehran Municipality in these two components is also at an unfavorable level. has it. To check the overall state of maturity of the knowledge management process, the results of the checks for the entire calculation are presented in Table 12.

Table 12. Inferential statistics related to the community average test for the maturity of the knowledge management process

Criteria	Inferential test					
	The test value is equal to 3					
	T	Degrees of freedom	P	Mean difference	95% confidence interval for the difference	
					lower limit	upper line
Maturity of the knowledge management process	-6.528	26	0.375	-0.606	-0.80	0.42

Table 12 shows that the value of pi in the maturity of the knowledge management process of Tehran Municipality is more than 0.05, so the maturity status of the knowledge management processes was evaluated as unfavorable. In Table 13, the findings about the status of the investigated factors in the evaluation of the maturity of the knowledge management process are presented.

Discussion

The purpose of this research was to investigate the relationship between the maturity of information technology and the maturity of knowledge management in the Tehran Municipality. In the present study, the data were analyzed using SPS software version 22 and the results of the study were presented. In this research, the overall maturity of information technology has been evaluated, and for this evaluation, the maturity model of the information technology management process, which was used by the Gartner Institute in 1999, was used. For this purpose, a standard questionnaire designed based on the maturity model was used. Also, to measure the maturity of knowledge management in the Tehran Municipality, the model of knowledge management evaluation tool and its related questionnaire have been used. The results show that the maturity of the information technology management process in Tehran Municipality is placed on the third

level of Gartner's information technology management process maturity model, i.e. the pre-active level.

The results also show that the maturity of knowledge management in Tehran Municipality is on the second level of the five-level model of knowledge management evaluation tool. Finally, the results of the Pearson correlation test show that there is no significant linear relationship between the maturity of the information technology management process and the maturity of knowledge management in Tehran Municipality. Examining the research findings using inferential statistics to measure the maturity of the information technology management process in Tehran Municipality

The purpose of conducting the average test for the society in this research was to examine the status of the factors and criteria of interest in evaluating the maturity of the information technology management process in Tehran Municipality and to determine the favorable or unfavorable position of each one. The results of the one-sample test show the status of the factors raised in each of the examined criteria in evaluating the maturity of the information technology management process in Tehran Municipality as follows:

Measured Criteria: Level of Preparation

- Information technology leadership and management activities in Tehran Municipality = desirable
- Operations management = unfavorable
- Customer service = desirable
- Human resource management = unfavorable
- Management of suppliers = unfavorable
- Introduction, provision, and dissemination of information technology services = unfavorable
- Measured criteria: tool levers
- Control and evaluation = favorable
- Problem tracking systems = desirable
- Management of configuration and assets = desirable
- Evaluation and testing of the infrastructure = unfavorable
- Security management = desirable
- Measured criteria: service support and delivery process
- Management of events and events = unfavorable
- Change management = favorable
- Rejection management = unfavorable
- Service level management = favorable
- Accessible management = desirable
- Capacity management = favorable
- Information security management = unfavorable
- Criteria under review: policies and documentation
- Documentation of services and support = desirable
- Quality requirements and commitments and policies = unfavorable
- Strategic trends = favorable

- Also, the results generally indicated that the maturity level of information technology in Tehran Municipality was evaluated as optimal.
- Also, the examination of research findings about the maturity level of knowledge management in Tehran Municipality was unfavorable and below the average level. The evaluation results for each of the knowledge management departments were obtained as follows:
- Systematic identification of knowledge gaps = unfavorable
- Creating a smart, complex and ethical mechanism for collecting knowledge = undesirable
- Searching for ideas in all places by organization members = desirable
- Formalizing the transfer process of the best business examples = unfavorable
- Transfer of tacit knowledge throughout the organization = unfavorable
- The central role of knowledge management in the organization's strategy = unfavorable
- Creation of marketing strategies and sales of knowledge assets of the organization = desirable
- Using learning to support the core competencies of the organization = desirable
- Hiring and evaluating people in the organization based on the level of cooperation in the development of organizational knowledge = unfavorable
- Encouraging and facilitating the sharing of knowledge by the organization = unfavorable
- The existence of an atmosphere of trust and open atmosphere in the organization = unfavorable
- Creating value for the customer as the main goal of knowledge management = unfavorable
- Flexibility and willingness to innovate as drivers of the learning process = desirable
- Employees' responsibility for their own learning = desirable
- Connecting the members of the organization to each other and to external communities by technology = desirable
- Creating an organizational memory accessible to the entire organization by technology = undesirable
- Approaching the organization to customers by technology = unfavorable
- Cultivation of human-centered information technology by the organization = unfavorable
- Fast availability of technology to employees = desirable
- Existence of timely, integrated and intelligent information systems in the organization = unfavorable
- Inventing methods of linking knowledge with financial results by the organization = unfavorable
- Creating a set of indicators to manage knowledge by the organization = unfavorable
- The existence of a balance between the set of hard and soft indicators and financial and non-financial indicators of the organization = unfavorable.
- Allocating resources to efforts that increase the organization's knowledge base = unfavorable.

Examining the results of the confidence interval estimation test for the mean, the results of the confidence interval estimation test for the mean show the maturity of knowledge management in Tehran Municipality with 75% confidence in the second level on the maturity model of the knowledge management evaluation tool. Three suggested solutions in order to improve the maturity level of knowledge management in Tehran Municipality, the present research suggests the following solutions to improve the maturity level of knowledge management based on the knowledge management evaluation tool model:

- Systematic identification of knowledge gaps and use of appropriate processes to eliminate these gaps
- Creating a smart mechanism based on ethical principles to gather knowledge
- Search for ideas from all members of the organization in all places
- Formalizing the process of transferring the best business examples and lessons learned
- Valuing tacit knowledge and transferring this knowledge throughout the organization
- Considering a central role for knowledge management in the institution's strategy
- Creating strategies To market and sell those assets
- Using learning to create and support core competencies
- Hiring, evaluating and rewarding employees based on the level of participation in the development of the company's knowledge
- Encouraging and facilitating knowledge sharing in the organization
- Creating an atmosphere of trust and openness throughout the organization
- Creating value for the customer as the main goal of knowledge management
- Creating flexibility and willingness to innovate in the learning process
- Employees' responsibility for their own learning
- Bringing customers closer to the company through technology
- Making technology readily available to employees
- Development of human-centered information technology
- Develop methods to link knowledge with financial results
- Developing a specific set of indicators to manage knowledge
- Creating a balance between hard and soft indicators and financial and non-financial indicators
- Allocation of resources to actions that lead to the enrichment of the company's knowledge base.

Also, the research findings using a correlation test to determine the relationship between the maturity of the information technology management process and the maturity of knowledge management indicated that there is no significant relationship between the maturity of the information technology management process and the maturity of knowledge management in Tehran Municipality.

Author Contributions

Authors in conceptualization, methodology, Software, validation, formal analysis, investigation, resources, data curation, writing—original draft preparation, writing—review, and editing had the same role.

Data Availability Statement

Data can be provided upon request

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Ethical considerations

The authors avoided data fabrication and falsification.

Conflict of interest

The authors declare no conflicts of interest.

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