

E-municipality Implementation and Development Case Study of Iran

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ABSTRACT

Today, increasing growth of new Information and communication technologies has provided opportunities for the public institutions to serve the public. Municipalities are recognized as one of the main elements of governments for providing satisfactory services to the people.

For this reason, use of new technologies for serving the public is a problem which is considered by the responsible authorities in recent years. In Iran, the first e-municipality activities have been commenced in almost a decade. For this reason, it is important to study progress of these projects.

In this study, we assessed the realization of e-municipality in Iran with regard to specifications of websites of the municipalities in capitals of the provinces and counties. In order to assess specifications of the municipalities' websites, Layne e-government four-stage model has been used. Statistical population of this research includes all websites of provinces municipalities (31 cases) and counties municipalities (360 cases) in Iran; we received the website lists from Iran's Ministry of the Interior.

Research findings show that municipalities of the provinces and counties are in the primary stage of realizing e-municipality but status of the provinces capitals is more acceptable than that of the counties. Also in regards with the implementation of e-municipalities, the provinces' capitals are better than the counties' capitals.

KEY WORDS: E-municipality, Layne model, Iran, Stages of E-municipality Implementation.

INTRODUCTION

Emergence of information technology and its increasing growth leads to creation of a major change from industrial society to informant society theoretically and practically. Promulgation of some terms such as e-banking, e-business, e-government, and e-education indicates increasing emergence of information technology in society level.

E-municipality plays important role in life of people in a society as one of the most important manifestations of the information technology.

Troublesome traffic, increasing pollutions and different problems which the large cities face are the most important factors which lead authorities of the large cities to use information technology and new tools for providing information and services to the citizens.

Creation and expansion of e-municipality have many advantages for municipalities.

But the main question is that what degree of e-municipality has been realized in Iran. Answering some fundamental questions is subject to its assessment. The previous studies have assessed development of e-municipality on the basis of content and usefulness of information site. Status of the e-municipality in Iran can be assessed with such approach. In any way, it is necessary to assess municipalities of the provinces capitals and counties in our country in terms of extent and manner of electronic information presentation and their services in order to recognize present status for access to ideal e-municipality and planning. This article tries to assess readiness of the Iranian executive bodies for providing electronic services on the basis of specifications of the executive bodies' sites.

E-municipality Implication

Today, when we move toward mechanization, face-to-face communication can't solve our problems. In modern cities, we face population increase and urban traffic increase. The past bureaucratic methods can't be suitable and efficient for dealing with administrative affairs of the citizens. For this reason, important organizations such as municipalities in large cities, which are regarded as beating heart of the city, should stop using the previous methods and enter electronic and virtual world to better satisfy the new demands. The world in which activities are performed more rapidly and reliably and there is no need for population density in physical world. We should find a solution for

reducing urban traffic, performance expenses, conducts and mental disorders, administrative corruption and tens of the problems which we face in large departments and organizations and the best solution is to establish virtual organizations which reduce the mentioned problems and even result in improvement of the working trend.

In order to reduce many urban problems such as traffic, environmental pollutions and heavy expenses resulting from unnecessary traffic of the citizens in near future, municipality services should be accessible through internet and websites of this institution. New concept of e-municipality originates from such essential need.

We can define e-municipality as follows:

E-municipality is the organization which provides its services to citizens rapidly, easily and safely by using information and communication technology. On the other hand, municipalities learn to act optimally for changing and establishing electronic services total system from making services online, reengineering of organization, citizen-oriented trends and integration among different sections for simplifying interaction, reducing expenses and developing urban services (Sarfarazi, 2007).

Specifications and advantages of e-municipality

- Excluding paper files and converting them to digital information
- Excluding sections relating to telephone operator in the organization
- Considering electronic communication and applying it in operator section
- Creating a place for exchanging views of citizens about performance of the mayor and municipality organization
- Paying duties for renovation etc through internet
- Excluding trends of municipality files and reducing physical traffic to the organization
- Informing activities of the municipality and affairs relating to city on a daily basis

By executing e-municipality, services of municipality are provided to the citizens, managers and policymakers through internet. It means that the citizens can receive their required information through internet by referring to internet portal of the municipality without coming and going in the city, information such as records of property including licenses and certificates issued by the municipality, construction rules and regulations, annual duties, outstanding debts of the property and some other cases such as registering request for issuance of license and receiving different enquiries reply through internet. In an e-municipality, there should be architectural and calculation plans in internet to be used by the citizens so that the result is announced to the addressees at request of the citizen and after performing necessary control processes on the basis of construction rules through the system.

Necessary infrastructures for developing e-municipality

1- Telecommunication Infrastructures

They include optical fiber and required strategies, internet and extranet and giving ADSL to the citizens, agencies and departments of municipality which shall be supplied by Ministry of Information and Communication Technology.

2- Legal Infrastructures

They include major policies of the government and importance of the subject for the government and set of the laws relating to execution of e-municipality, its use and creating legal opportunities and other cases.

3- Cultural Infrastructures

They include specialized HR training, training of municipality personnel who are involved in execution of the e-municipality project, training of citizens and users of e-municipality services and culture building advertisement and other mental and motivational cases

4- Software Infrastructures

They include processes reengineering, recognition and development of electronic services, integration of information systems and applied software and finally development of formal website of e-municipality (Ghoochani, 2008).

Duties of e-municipality

Duties of e-municipality can be divided into four sections of offline information provision, immediate information provision and social information exchange.

1- Offline information provision

Information provision such as maps, news services, welfare and commercial information, e-shopping, tourism, hotel management, reservations, postal and communication services requested by the citizens and tourists

2- Online services

Providing different services such as completing and sending forms, administrative affairs such as receiving or extending construction license, saving files and software programs through the sites which are supervised by the municipalities, opinion survey and e-learning as well as financial interactions such as payment of fines, slips, tax, e-shopping and even holding governmental bids and auctions

3- Supply immediate information provision

Providing of necessary and immediate information such as weather forecast, information about traffic, emergency and police information release, financial market and property information

4-social information exchange

Such as gap room, talk groups, environmental protection groups, scientific, cultural, artistic, political and economic groups which all provide cultural opportunity for e-democracy in addition that it helps knowledge sharing and filling leisure time of the people.

Barriers and problems of e-municipality development

1- Providing high speed internet: with regard to the use of ordinary telephone lines, speed of network connection is low and there is need for use of ADSL.

2- Lack of experienced and knowledgeable HR to work with networks and webs and their time shortage due to being multi-task

3- Lack of proper database in each municipality

4- Lack of integrity in websites design

Barriers of e-municipalities implementation:

1- Barriers to standardization of legal frameworks

2- Incorrect implementation of processes and procedures

3- Lack of clarity

4- Shortage of human resources skills and imperfect technology sources

5- Lack of communication with government

6- Lack of computer hardware and software

7- Lack of information literacy

8- Lack of electronic infrastructures

9- Lack of education in e-municipality development

10- Changing traditional slow trends to new administrative and managerial trends

Stages of e-municipality development

Different models have been mentioned about evolution and establishment of e-municipality. In one model, e-municipality establishment is mentioned in four stages of emergence, promotion, interaction, and integration. The model which we used in this research is Layne four-stage model which is as follows:

Layne four-stage model

1- Cataloguing stage : in this stage, communication of municipality with citizens is one-sided and municipality catalogues and lists a compiled and structured set of the information required by the citizens so that the user receives the required information from portal of the municipality in no time and with the least effort.

2- Interaction: in this stage, communication can be two-sided that is the citizens can download their required forms through internet and can also email their problems to the municipality. The municipality has no obligation to answer the emails.

3- Administrative transaction: in this stage, two-sided communication is established and the citizens can upload their completed forms on the network and give them to the municipality and prevent them from referring to the municipality. In this stage, no financial payment or receipt is mentioned.

4- Full transaction (administrative –financial): in this stage, full two-sided communication is established so that citizens can pay duties, fine and charges to the municipality's account electronically while filling forms digitally and sending them electronically to the municipality.

Research questions

Questions of this research have been raised as follows by selecting the Layne model because it is comprehensive in defining e-municipality formation stages:

Q1: To what extent have specifications of e-government four stages (cataloguing, interaction, administrative transaction and full transaction) been realized in websites of the provinces and counties municipalities?

Q2: Is there difference between municipalities of provinces and counties in realization of e-municipality?

RESEARCH METHODOLOGY

This research is of survey-descriptive type because the researcher has studied variables in real scene and the variables are described as they appear to be. Statistical population of this research includes all websites of provinces

municipalities (31 cases), counties municipalities (360 cases) in Iran of which lists were received from site of Ministry of the Interior. Due to the limited number of group A, sites of all municipalities of the provinces were studied but the sample size was determined to be 181 persons with use of Krjy and Morgan table in the second group (capitals of the counties). In order to increase similarity of the sample with the whole society and increase accuracy of sampling, for estimating the parameters of population and interfering specifications of population in the sample , group sampling method was used so that the number of counties of each province (as the number of persons in each population group) was separately provided (N_k). Then, we divided the number of counties by total number of counties (360) $P_k = \frac{N_k}{N}$ and multiply the obtained percentage by the sample size which was 186, $n_k = P_k \times n$. The obtained number manifests the number of counties for each province to be studied. With regard to common specifications of such institutes, the related samples were selected among counties of each province by using the random numbers table. In this research, observation method was used in order to gather data about specifications of the executive bodies' websites. It means that a checklist with 37 variables was prepared and the required data was collected by observing websites of the municipalities relating to provinces and counties in 2010. The prepared checklist shows specifications of four stages of e-municipality and 15, 5, 14 and 3 variables were selected for stages of cataloguing, interaction, administrative transaction and full transaction. In comparison with the questionnaire, observation method is more valid because in the latter data gathering is based on researchers' observation of realities. Since the presented material in the websites of executive bodies is regarded as governmental electronic documents, the provided information has enough validity.

Research findings

With regard to the efforts of government and municipalities to establish e-municipality, there is a question, "to what extent this case has been realized with regard to e-municipality evolutionary stages model?"; in order to answer this main question, specifications of websites belonging to municipalities of provinces and counties are described in terms of different stages of e-municipality in tables 1 to 5.

Table 1-degree of realizing specifications of cataloguing stage in municipalities of provinces and counties

Counties municipalities		Provinces municipalities		Specifications	No
No	Yes	No	Yes		
79	107	0	31	Website	1
169	17	11	20	Information for contact (telephone, fax etc)	2
132	54	4	27	Guide to use site	3
137	49	12	19	Information relating to laws and regulations	4
157	29	6	25	Information relating to organizational unit	5
157	29	6	25	Information relating to deputies (organizational chart, description of duties)	6
121	65	8	23	Information relating to climate of the city (climate etc)	7
168	18	15	16	Environmental information (libraries, trading centers, garbage collection etc)	8
167	19	13	18	Urban space information (green space, parks, recreation centers)	9
163	23	16	15	Statistical information (the newborn, deceased, population rate etc)	10
129	57	11	20	Tourism information and services	11
107	79	10	21	History of city	12
177	9	13	18	Information of organizations (address, telephone)	13
177	9	12	19	Link to affiliated organizations	14
180	6	19	12	GIS System	15

Table 2 shows that more than 50% of the cataloguing stage in websites of the provinces municipalities and only 20% of specifications of this table have been manifested in counties. On the other hand, provision of static and fixed information about goals and missions, related laws and regulations, organizational units, information for contact and the like have been institutionalized in capitals of the provinces but 42% of the municipalities in counties are deprived of a simple website.

Table 2 shows two specifications of interaction stages which represent two-sided relationship between municipality and citizens. As shown in the table, 28% and 11% of specifications of this stage have been realized for municipalities of provinces and counties respectively. On the other hand, we can say that municipalities have entered evolutionary stage and seek to establish two-sided relationship.

Table 2-degree of realizing specifications of interaction stage in municipalities of provinces and counties

Counties municipalities		Provinces municipalities		Specifications	No
No	Yes	No	Yes		
177	9	27	4	Receiving the required forms from website	1
133	53	13	18	Sending views, complaints, suggestions through email	2
174	12	21	10	Communication with senior managers of the municipalities	3
130	56	14	17	Opinion survey	4
183	3	30	1	Receiving urban software	5
183	3	28	3	Receiving virtual education	6
184	2	29	2	Observing urban development files	7
149	37	14	17	Information about bids and auctions and receiving the related forms	8
185	1	30	1	Legal issues handling system	9
173	13	18	13	Updating information regularly	10
181	5	28	3	Publishing electronic magazines	11
174	12	26	5	Subscription for receiving newsletter	12
149	37	21	10	Internet Public communication system	13
148	38	13	18	Information about work procedure and the required documents for receiving licenses and services which the municipality presents	14

Table 3-degree of realizing specifications of administrative transaction stage in municipalities of provinces and counties

Counties municipalities		Provinces municipalities		Specifications	No
No	Yes	No	Yes		
186	0	31	0	simultaneous and immediate accountability to the clients	1
185	1	21	10	Calculating duties	2
186	0	31	0	Electronic signature for conclusion of contracts	3
185	1	27	4	Uploading forms filled by the citizens on website of the municipality without attending physically	4
186	0	28	3	File and certificate enquiry system	5

Table 3- shows specifications of administrative transaction stage which manifests electronic transactions and services. As shown in the table, only 10% of these stage specifications in municipality provinces and 2% of the specifications in counties are manifested. On the other hand, readiness of e-municipality for provision of electronic services is very low.

Table 4--degree of realizing specifications of full transaction stage in municipalities of provinces and counties

Counties municipalities		Provinces municipalities		Specifications	No
No	Yes	No	Yes		
186	0	24	7	Online payment of duties (renovation, automobile...)	1
186	0	30	1	Providing online services (issuing license, enquiries)	2
185	1	29	2	Digital completion of forms and sending them to the municipality electronically	3

Table 4 shows four specifications of full transaction stage in which it is possible to perform financial transaction in addition to provision of electronic services. Data of the table shows that this readiness is 10 and 1% for the provinces and counties respectively which indicates very low readiness of municipalities.

Q1 Testing:

In order to answer this question, “to what extent specifications of four stages of e-municipality have been realized?”; the following statistical hypothesis is mentioned and single sample t-test was used for data analysis and the results are given in table 5.

$$\left\{ \begin{array}{ll} H_0: \mu \leq 0.50 & \text{average specifications of each stage are lower than or equal to the medium level.} \\ H_1: \mu > 0.50 & \text{average specifications of each stage are higher than the medium level} \end{array} \right.$$

Table 5-testing degree of realizing specifications of e-government stages

Average	Test value =50%				Ratio of the realized specifications
	Significance level	Degree of freedom	t	Municipality	
%6511	.000	30	13.723	Province capital	Cataloguing stage
%2030	.000	106	11.374	County capital	
%2750	.000	30	9.745	Province capital	Interaction stage
%1088	.000	106	10.274	County capital	
%1032	.001	30	3.775	Province capital	Administrative transaction stage
%0043	.744	106	-.328	County capital	
%1074	.008	30	2.858	Province capital	Full transaction stage
%0017	.075	106	-1.793	County capital	

What is observed in table 5 is that only stage of cataloguing in counties has average above 50%. With look at significance level observed for interaction stage, administrative transaction and full transaction in municipalities of the provinces and counties and stage of cataloguing in municipalities of the provinces and counties with confidence level of 95%, we can claim that specifications of the above stage are lower than 50%. Average observed in table 5 confirms this issue. Generally, specifications of the stages in municipalities of the provinces and counties except for municipalities of the provinces in cataloguing stage (65%) are not acceptable (above 50%). Percentage of specifications realization is reduced when we move toward the lower stages.

Q2 Testing:

In order to answer this question, “if there is difference between municipalities of the provinces and counties in realization of e-municipality implementation stages?”; The following statistical hypotheses have been mentioned in order to test equality of averages and the analysis results are given in table 6.

$$\begin{cases}
 H_0: \mu=0.50 & \text{there is no significant difference between municipalities of the provinces and counties in realization of e-municipality stages} \\
 H_1: \mu \neq 0.50 &
 \end{cases}$$

Table 6- Municipalities of the provinces and counties in realization of e-municipality stages

Average		Standard error	Averages difference	Significance level	t	Ratio of the realized specifications
Counties capital	Provinces capital					
%2030	%6511	%047	%4481	.000	-242.103	Cataloguing stage
%1088	%2750	%027	%1662	.000	-182.481	Interaction stage
%0043	%1032	%026	%0989	.000	-965.903	Administrative transaction stage
%0017	%1074	%035	%1057	.000	-1.817	Full transaction stage

With regard to significance level observed in table 6 in confidence level of 95%, we can reject null hypothesis. On the other hand, we can say that there is significant difference between realized specifications of the provinces and counties in five stages of e-municipality. On the basis of the obtained information in research, although the provinces are not satisfied with realization of e-municipality stages, they have better status than the counties have.

Research Findings:

1. Municipalities of the provinces and counties are in the primary stage of realizing e-municipality but status of the provinces capitals is more acceptable than that of the counties.
2. The capital cities of provinces are better than capital cities of the counties in regards with the implementation of e-municipalities.

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