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Original Article

The Evaluation of Urban Management Readiness Level in Moving Toward Information System Management (Case Study: Baharestan Municipality)

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ABSTRACT

In the current world, IT provided effectiveness and efficiency of information. According to the studies, IT increases the ability of the organizations and facilitates the administrative trend and increase of output of human resources and management. By the increase of control on management information systems, the speed and quality of decision making and management are increased. Like other phenomenon, the selection of the best system based on the underlying conditions of the organization is a vital principle. As any decision making and policies to develop the organization in using the management information systems requires awareness of the current preparation of the organizations, we required an evaluation model to be aware of the preparation in the organizations to move toward information systems. The present study is applied to present a model in this regard and its implementation in districts 1, 2 of Municipality of New City of Baharestan in Isfahan and also it is based on the results of the questionnaire and presenting the propositions in accordance with the study.

Keywords: Information technology system, Urban management, Management information system, E-readiness.

Introduction

Today, business and IT are interrelated and separating them in the organizations is impossible. Information systems are new management tools helping the organizations in achieving their business goals. The present study aimed to present a model to evaluate the readiness of the municipalities in accepting information systems. In the present study, by designed questionnaires, the comments of experts of two districts of Municipality of Baharestan in Isfahan were collected and based on a model; different indices of each of the components were evaluated and identified. By such model, we can determine the readiness of a municipality in using management information system

and present the suitable strategies to improve their weaknesses.

Definition of information system

Information system is a complete system designed for production, collection, organizing, storage, and recovering and information distribution in an institution, organization or any other defined field of a society.

The definition of management information system

One of management information system (MIS) types is computer information system management that can gather and process information from various resources in the organization for decision making at management level. These information systems process the produced data by transaction processing system (TPS) and present them in a new significant form as the reports to the manager. Simply, it can be said that management information system by producing the brief, infrastructural with regular and repetitive basic facilitates the management work and use its output to control organization activities, planning and organizing (Sarafizade and Alipanahi, 2002).

The concept of Management information system

The organization management information system presents a general framework that other information systems will be consistent with each other based on it. Now, management information system is considered as a collection of sub-systems that are designed and implemented, if necessary but they are in accordance with the general design, standards and procedures of management information system (Davis and Olson, 1985).

Physical components of management information system

There are important factors in a management information system including hardware: Technical equipments, processing hardware, storage and recovery of software information: system software and applied software of database: The lack of redundancy, data transparency, timely updating, formulating the standards and policies to have access to database of human resources: Programmer, IT systems manager (Figure 1), Information counselors.

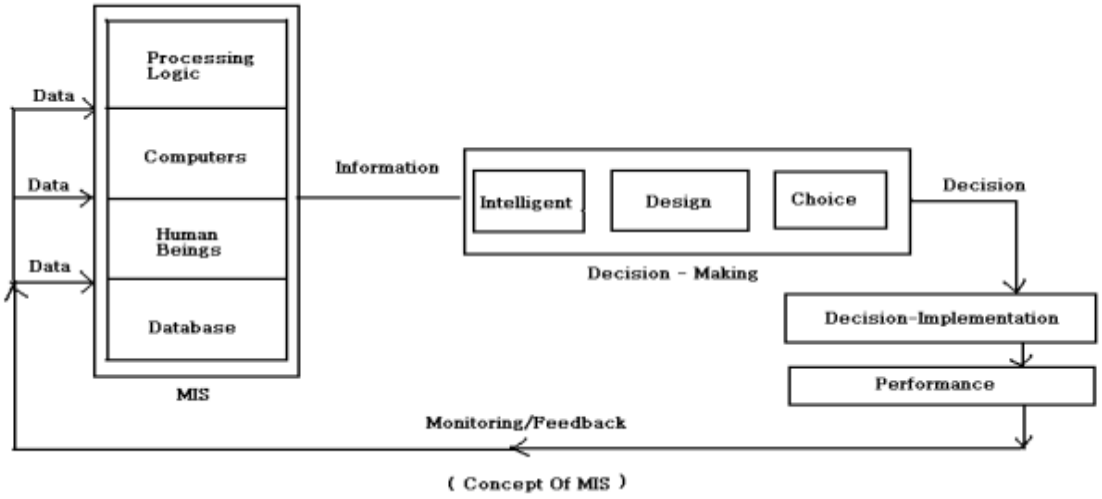

Figure 1. The components of management information system

The concept of urban management and Municipality

The extension and complexity of urban issues and increasing development of the cities changed the management of city affairs to different duty. Besides some issues as environment, transportation, safety and urban planning, one of the important factors having increasing effect on urban constructive factors is urban management. If the city is considered as an organization, it is required that an element for future planning and organizing the current affairs is considered at first. This element is called city management. There are various issues in the cities and to solve them and respond to the existing request in collective life fields, urban management is a necessity. This issue is of great importance namely in service and pubic civil issues. Thus, such affairs as health and hygiene in the city, keeping green space, providing safety of the city and citizens required an organization with definite formations to perform urban management as best. Therefore, urban management means organizing the factors and resources to meet the demands of city residents and includes functions of planning, implementation, supervision, control and guide and for influencing should be based on the will of the citizens and social contracts (Lavden, 1988).

Functions of IT in Municipalities

Providing the information demands of citizens: The required needs were including industry and technology information, research and development, medical and para-medical basics, strategic and safety, humanistic (demographic, anthropology and ecology), cultural, literal and artistic. Intelligentization of transportation and traffic control: The news and information of the roads, traffic, road civil projects and plans, the number of cars driving in the free way and road networks to increase the capacity of the roads can be issued every moment. The management of traffic system by computer system (e.g. by automatic traffic camera), the traffic flow of the roads and on the bridges is investigated. The information is processed and distributed by specific traffic operators and by information collection system. The mass media including Radio is connected to computer systems to report the condition of road traffic. The information and images of traffic flow, casualties, road construction, etc are acquired by traffic cameras and the citizens can achieve it. To balance, parity and equal opportunities: The imbalance in distribution of the facilities and opportunities of urban services in various locations is one of the important problems in the metropolises. By the development of communication and information technology and via providing the virtual facilities, the development of the lack of facilities can be avoided in various locations. The simultaneous access to information for all people saves time and current costs and avoids the formation of unhealthy relations in contracting transactions of the organization. The increase of participation: In accordance with article 15 of Iran services, the municipalities increased the participation of their citizens in various levels (participation in determining the needs and priorities, determining the local capacities and capabilities), implementation of the plans and supervising the performance of the city managers. Presenting good service system: Technology development in the organization is the origin of change and effect in urban services system. Rapid and exact information, facilitating the affairs and the affairs of clients, commitment to the rules, suitable rules and behavior with

the clients are some of the characteristics of a good services system. Respecting the citizens: The effective factors in satisfaction of the clients to organization are including: humanistic skills and the manner of doing the task.Presenting the good services based on the client need: The role of technology in respecting the clients to Municipality is due to its effect on improving humanistic skills, modification of work methods and presenting the need-based services. Applying geographical information system: Various organizations in accordance with the management needs by spending a lot of money collect data. By geographical information system, the beneficiary organizations can use the urban information. Thus, in addition to saving the costs and avoiding the repetitions, the urban changes can be observed.E-learning: IT made some changes in structural and methods of training the citizens. The electronic instruments presented the new capabilities based on the need and taste of the learners. Thus, the clichés of "learner city" and "learner citizen" is fulfilled in case of using electronic learning systems in E-municipality.

Tracking systems: Tracking systems in urban services, the advantage of using electronic tracking systems in urban services led into the increase of services quality, increase of rapid decision making and presenting the services, reduction of the costs, avoiding the probable misuse, optimized control of the system during cri sis and increasing the precision and speed in the analyses.Public supervision of Municipalities: Any organization based on its audience in the society and the interactions considers special position for people supervision on organization performance. The variety of public opinion on organization performance is possible via improving the public supervision of the organization and using theoretical basics and an effective system. One of the modern methods of supervising the organization performance is supervising the technology basics. In this method, supervision is intangible and more control is done in the system via modern software. The most important effects of public supervision in the municipalities is including as:Equal opportunity for the citizens to have access to the urban managers and fulfilling the justice-based approach.Establishing the exact and direct supervision of citizens on urban managersDetermining the threats and opportunities of urban managersProviding the exact supervision of the comments and requests of people in administrative servicesBetter responding to the people demands and expectationsMutual information to citizens and managersControl of urban structures: Intelligent systems of urban structures control, building safety level (Materials type and stability) and structures resistance against the environmental conditions and natural disasters are investigated and required information is presented in accordance with the consistency of the building with the space.Easy and public use of communication and IT (Narasimhaiah Gorla et al., 2010).

The benefits of establishment of IT systems

According to urban managers, establishment of IT systems can facilitate the activities, transparency of presenting the services and using people comments. According to the citizens, receiving services at any time or any place is the best opportunity leading to their satisfaction.

The benefits of establishment from the view of urban managers

Creating database-increasing communication between different sectors, sharing information sources, management efficiency and improving the decision making process, better identification of the problems and weaknesses of the city, increasing the control power and supervision on the city, saving time and cost, providing high quality and high-speed internet services for the citizens, providing different education channels and permanent education environment, improving the life quality of people, presenting one-stage services to the citizens, better communication of the organizations and various urban organs, increasing the people participation in management of the city, decreasing city traffic based on using internet in urban activities of the citizens, reduction of air pollution with the decrease of urban traffic, saving time and energy, creating required infrastructure for future development of the city, reduction of administrative corruption via transparency of the processes, increasing order in city activities by comprehensive information system.

The benefits of establishment from the view of the citizens

Better follow up of the affairs, access to required urban database, sharing information sources, better identification of the problems and weaknesses to improve decision making in some processes of life, saving time and costs, general improvement of life quality, receiving one-stage services, using good opportunity via e-commerce, better communication with the organizations and various urban organs, 24-hour access to urban services, increasing awareness, using high-quality and high-speed internet services (Doke and Swanson, 1995) Based on the benefits of establishment of IT systems, the main question of the study is that according to the views of the employees, did IT system improve their performance or their department? One main hypothesis and five sub-hypotheses are investigated and each was consisting of two variables (independent and dependent). In the present study, IT system is independent variable of the study that is divided into sub hypotheses and dependent variable is organization effectiveness (Grafton et al., 1997).

The significance of feasibility

Any project should be evaluated before implementation from various aspects as financial, time, human resources, technical, etc. The present study aimed to be assuring of the organizational capabilities to achieve the suitable results to take decision to do the project or not do it. The studied project in the present study is implementation of management information systems in the organizations including the municipalities. As implementation of these systems needs more capital, time and other resources, taking decision of it is of great importance. Indeed, the high significance of management information systems is due to the essential characteristics of thee systems as:

High costs and time of the project, High share of implicit costs of total costs, Hardware-human resources-software-database of the main components, Figure 2- physical components of management information system ,High risk taking, Involvement of total organization, Change management, Culture creation and preparation. Thus, true understanding of readiness for goo orientation of the attempts and formulating good strategies is of great importance and is raised as a key factor of success for implementation of these systems. It is necessary that the

organizations before taking any measurement for implementation of management information systems, evaluate (investigate the feasibility) the implementation of this system that the system is implemented based on the existing realities and limitations of the organization (Ashreghnia and Javdani, 2005). In other words, the effects of management information systems on the organizations were as some organizations were developed in business and some other organizations were failed. To do this, one of the early stages for establishment of management information systems is evaluation of e-readiness of the organizations for good application of the systems to avoid the waste of financial, humanistic and organization resources. As it was said, it is attempted to find a good evaluation model to be aware of the readiness of the organizations in accepting the information systems.

Review of literature

CSPP. This model was presented in 1998 by CSPP managers. CSPP is executive model of IT companies in USA (Fathian and Mahdavinoor, 2004).

APEC, the group model is APEC. This model was presented by economic collaboration of Asia and Oceania in 2000 (Pahri, 2002; Jalali, 2007).

This model was presented by international telecommunication union (Sarafi and Abdollahi, 2008). There are also other models.

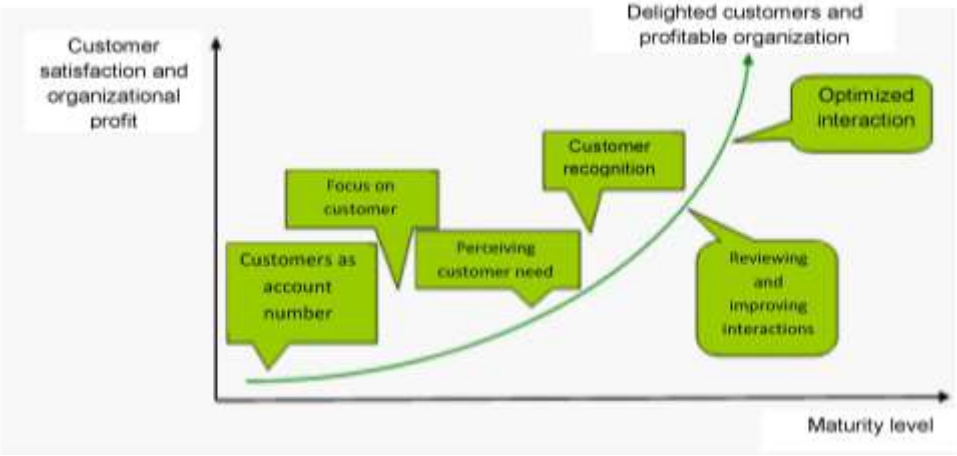

Figure 2. Maturity model for customer relationship management

Materials and Methods

Data collection method

For data collection, a web-based questionnaire in Municipality portal was provided based on the identified indices. In this questionnaire, the defined variables in each of the indices are questioned in two forms. First, the people in the organization should record the score of their organization about each of the asked questions in score column based on their knowledge and work experience and the entered number should range 0 to 100. In the second form, as each question is of importance in determining the readiness of the organizations, the people by choosing one of choices 1 to 5, determine the importance of the asked question. The important point in the questionnaire is that choosing all the indices to respond their questions is not obligatory. In other words, people can choose their favorite indices among ten proposed indices but by selecting each of the indices for responding, all the questions are

responded. People in this questionnaire can propose new variables and indices. In the next stage, the proposed variables from required people are added to the questionnaire and are distributed in the form of a new questionnaire for the second time among them. The required organization is evaluated based on the new questionnaire. The processing of the questionnaires is based on Delphi method (Nazarian, 2009). In this questionnaire, people before responding the questions of indices, fill out the form of personal characteristics including age, education, position and experience of specialized activity to be applied in accordance with the mentioned method in the evaluation of the organization.

Defining evaluation indices

In this section, the required evaluation indices for each of the evaluation fields of organizations readiness in accepting the information systems are presented. The indices are defined as covering the whole organization and determine clear condition of IT and its sub-systems. The defined indices for evaluation of organizational readiness are divided into 10 main fields. The checklist of evaluation of E-readiness in each of 10 fields is shown in Table 1.

Hardware
Software
Network
Safety
Database and information systems
Processes and systems
Management
Human resources
Legal and financial
Customers, suppliers and partners

Methodology and evaluation model of organizations readiness

The presented model in this paper is of two dimensions. In the first dimension, the statistical population in the study organization completed the questionnaire based on the explained method. In the second dimension, some of the experts are invited to give weight ranging 0-100 to each of 10 indices (hardware, software, network, safety, database and information systems, processes and systems, management, human resources, legal and financial, customers, suppliers and partners) presented for individual properties (age, education, position, specialized activity). It can be said that to each of 4 cases referred to individual properties in the model, the weight was 0-10. The presented weights from the model itself and each of the experts showed that necessity of mentioning each of them in the questionnaire. Indeed, the second dimension gave depth to this model and increased the accuracy of the model. Then are processed in accordance with 6 mentioned stages at the bottom of collected data. By responding the questionnaire in the first dimension, a numerical mean is obtained. This numerical mean is calculated based on the responses given to the score and the importance of the question.

In the next stage, for each of 4 cases presented for individual properties for each person (respondents in the first dimension and experts and key people, then the second dimension of the score of each expert person is given in accordance with the score of each 4 cases of individual properties and weight given from the model itself to these 4 cases) an then the importance of each expert is obtained. In the third stage in accordance with the importance of each person from each expert and weight which of the experts to 10 indices and 4 cases (individual properties of a numerical mean) and weight of which of the experts to 10 indices and 4 final cases for each of the 14

cases are obtained. In the fourth stage, in accordance with the final calculated weight in the third stage and score of (respondents to the questionnaire in the second stage), the importance of each person is calculated. In the next stage based on the numerical mean for each index in the first stage and the importance for each respondent to the questionnaire in the fourth stage, the final score of each index is calculated. Finally, in the last stage in accordance with the final weight obtained for each index in the third stage and final score calculated for each index in the previous stage, the score and total score of the organization is obtained and by this number and chart, a general view of organization readiness is a achieved and for accepting or rejecting the information system in the required organization, the decision is taken. The results of evaluation of readiness of Baharestan Municipality in Isfahan in accepting information systems to validate the proposed model, the readiness of two municipality districts is investigated and after data collection of the questionnaires distributed among 60 staffs of each of two districts and applying this model on the data, a correct understanding of evaluation indices is achieved. Thus, the weaknesses and strengths of each of indices in the organizations are identified and the required executive plan is performed. The total score in this evaluation for municipality of district 1 was 62 and for district 2 were 56. The following charts showed the result of performing the mentioned model in two districts of Municipality, respectively.

Chart 1. The readiness of district 1 of Municipality in accepting information systems

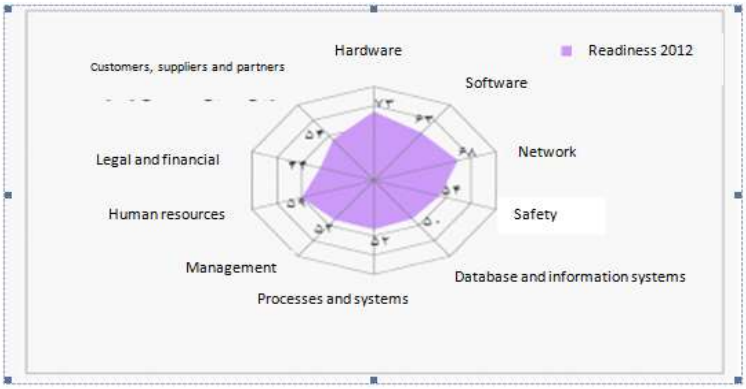

Chart 2. The readiness of district 2 of Municipality in accepting information systems

Conclusion

Namely, the municipalities apply IT and communication in their districts by various methods but without using a good system, the readiness of the districts is not defined and improved equally in accordance with the need of the citizens. An innovated model was introduced to measure the organization maturity in accepting information systems. In this proposed model, some indices as hardware, software, network, safety, etc were applied and based on these indices; a checklist was presented to evaluate the readiness of the Municipalities. In the next stage, the data of each of the indices were collected from Baharestan Municipality and after their analysis based on the proposed model; the existing condition of these two districts was identified to take some strategies for them, if necessary. As a general result and based on the obtained information of the questionnaires and the following model, it can be said that pre-requirement of a successful implementation of information systems in an organization is having a top management, effective and strategic planning, continuous supervision and leadership and investment.

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