

Investigation of Factors Affecting Development of E-government Infrastructure in Iranian Commerce Sector

Mohsen A'zami¹, Fardin Hafezi², Mahdi Golestani³

¹Department of Business Management, Payam Noor University, Iran

²Department of Accounting, Payam Noor University, Iran

³Department of Accounting, Payam Noor University, Iran

ABSTRACT

E-government is an idea and it is time for it. In many countries, attention to e-government and its implementation is very important. E-government is a new ambition in many countries to modernize and restructure public organizations and offices. Some developed and some developing countries have taken actions for establishing such a government. However, establishment of e-government involves basic challenges and will follow serious challenges. Therefore, such countries have considered state-governmenties and IT techniques for implementing e-government. The present research is a field study and investigates factors affecting development of e-government infrastructure in commerce sector in Iran (Tehran). Furthermore, geographical area under study was Tehran and its commercial centers. The research is of descriptive-analytical type and statistical methods were used to investigate factors affecting e-government infrastructure and descriptive statistics like frequency table. Data was gathered by library and exploration methods. Questionnaires were distributed among e-government experts, commentators, and specialists and the received questionnaires were analyzed by SPSS and the hypotheses were tested and t test was used. Furthermore, Lee Ho method was used to rank factors affecting e-government infrastructures in commerce sector in Iran. Cronbach's alpha was used to investigate questionnaire reliability. The calculated number for Cronbach's alpha was 0.89. Recommendations which were based on the results are as follows:

- Presence of a certain state-governmenty is a factor which affects e-government infrastructure development;
- Use of experts' opinions in the field of e-government will cause improvement of state managers' knowledge level especially in commerce sector in the field of IT and communications;
- Presence of traditional approach in managers will not lead to development and change in the present situation and some of them oppose internet and satellite technologies;
- Investments must be done in the field of development of necessary infrastructure and establishment of e-government in commerce sector;
- High-rank managers support for planning and success of e-government implementation is necessary.

KEYWORDS: e-government, infrastructure, ICT

1. INTRODUCTION

The start of 21st century and information era has been accompanied with very serious worries and challenges and none of the development plans designed for solving these issues has been able to definitely solve these issues (Kelly, 2003). In many experts, governors, statesmen and commentators opinion, IT revolution can play important role in confronting with these challenges (Mornan, 2002, 12). This technology provides managers with opportunities like re-engineering, increase of access capability, improvement of efficiency and making governments more responsive and seizure of these opportunities will stabilize e-governments which are necessary for governing in information era (Bakas, 2001, 5). According to the recent transformations in the world, public sector and state organizations have been affected by global transformations. Movement of <<government recreation>> which was introduced by (David Azbourne and Tedgibler, 1992), is a movement which tries to divert government concentration from an organization-based external approach to a internal or citizen-based approach (Key Hou, 2002, 435). In fact, this movement focuses on customer satisfaction (Tompson and reyKiusi, 1998, 214). Studies concerning ICT implementation in different countries show that some developed and developing countries like USA, England, Holland, Sweden, Australia, Norway, Finland, India, China, Singapour and even Namibiya have put ICT implementation in top of their agenda and try to make basic changes in offering public service (Burkeh, 2000) but they have a long way ahead. E-government is a combination of IT and web information network which aims at presenting service to citizens, economic sectors, employees and other sectors of government. This phenomenon was started with the emergence of digital revolution (Ekut Uma and Kaferi, 2000). At that time, many public organizations presented a wide range of resources, publications and information banks as real public service to citizens. This resulted in increase of

*Corresponding Author: Mohsen A'zami, Department of Business Management, Payam Noor University, Iran
E-mail: aazami1990@yahoo.com

efficiency and effectiveness in public systems, service provision for people and attraction of public satisfaction in a wide level (West, 2000, p23). Moreover, World Bankin 1995 designed a development plan for information utilization in developing countries and application of IT to governments' reforms plans was among the main goals of the above plan (world bank, 2003). According to the previous discussion, these actions and changes will lead to new type of relations among countries and nations and its conversion from traditional form to digital form. And Iran must also become up-to-date. That is to say, there are two important necessities including internal necessity (achieving e-government goals) and external goals (establishment of communications system and social activities based on process and transfer of information until 2010) for establishing e-government in Iran but they are dependent on the preparation of basic infrastructure.

A REVIEW OF RESEARCH LITERATURE

Advances in computer and ICT science have enabled organizations to use new commercial strate-governments in order to achieve steady competitive advantage. In the early 1990, internet and IT started to influence on organizations growth and development and competition in micro- and macro-economic levels. Moreover, as more suppliers and customers establish relationship electronically, the speed, orientation and emphasis on strate-governmenticposition of competition have changed from traditional commercial condition into on-line commercial transactions and the present digital economy will go on with a considerable growth rate.

IT is changing the world rapidly. These changes will be observable more in the early 21st century. USA and EU countries are among the first countries which applied this new technology. Other countries like China, India and Korea also hope to use this technology due to skillful work force (Basu and Jones, 2003). Most successful organizations predict need to change and take action before their competitors. Pioneer organizations make use of e-government in order to increase speed of action in presenting service and improving competitive advantage. However, internet growth rate is so rapid that e-government will soon become a necessary confdition and not as an innovation tool (cisco system). In other words, governments use new technologies and especially internet to spread access to public service and information for citizens, commercial institutes and other categories of society and also other parts of the government itself and this is the very concept of e-government or digital government. It is expected that about 40% of all USA investments will be in IT sector until 2004. Furthermore, it is predicted that the costs of federal and local governments on internet and e-service will increase by four times in the period 2000-2005 and increase from 1.5 billion dollars to 4.2 billion dollars. Therefore, USA is moving towards establishment of e-government in all aspects of society and benefits from its potential advantages and many costs are saved for the government, businessmen and consumers. It is important that interaction between government and citizens changes from its traditional form into a new mutual form. Other countries like Germany, England, Nwesland, Australia, Syngapour, Korea, Japan, China, Malaysia and indiahave implemented e-government. The general aim of these actions is to electronize organizations and therefore offer faster service to citizens and private organizations. The structure of this comprehensive plan can be analyzed based on relationship point. First is introduction of IT role in establishing relationship between government and citizens which is called G2C. Second is the relationship between government and commercial sector (G2B) and the third is digitalization of executive organizations which is called G2G. it must be mentioned that establishment of an e-government is a wide subject and forms a national information structure so that it contains central government, local governments, private institutes, families and different individuals.

Definitions for e-government

E-government means use of ITC for changing governments and the process of governing into a more accessible, efficient and responsive form. Another definition for e-government is utilization of ITC power for creation of a new structure of government that matches with information and network society. Therefore, e-government facilitates information society performance. So, e-government contains the following items:

- 1) creation of access to public information
- 2) improvement of participation through empowering the public in order to establish relationship with state figures by network interaction communications
- 3) increasing responsiveness by means of making activities more transparent
- 4) providing development conditions in rural and deprived re-governmentsions.

E-government is a combination of public service provided through internet. It is obvious that e-government definition is very wider than websites that provide citizens with service or information, but it affects all managerial micro- and macro-arenas and also relations between organizations and people and public management.

Recent studies have shown that the most important worry of e-government managers in developed countries is not technology restrictions but is e-government policies. Therefore, cooperation and interaction between offices managers, concentration of thoughts on goals of e-government instead of concentration on

offices individually and attempt for understanding communications are very important. E-government is the establishment of more cost-effective patterns in order to facilitate business online interactions among citizens and employees, industries and other beneficiaries which integrate government entities, processes, organizations and technologies (Torman and Davis, 2001, p 35). E-government, according to the definition of one of the experts, (Lynn and Leo, 2003) means utilization of world wide web with the aim of offering online service for citizens and establishment of possibility electronic interaction among citizens and organizations in different levels of government. Therefore, systems of presenting service and information based over internet is mutual and 24 hour/7 days, contrary to traditional structures that were one-sided and linear (Kubinsand, 2003). E-government means using IT and especially internet by government in order to increase access level of citizens, public centers, private sector employees and companies of private sector to online service and information (Layne, 2001).

2-2- E-government advantages

This is a fact that governments all over the world and especially in developing countries spends a lot and provides less service and is not responsive and responsible enough. Government amendments have been accompanied by administrative corruption and some failures. E-government is a new kind of doing amendments to processes which facilitates relationships between citizens and government. Today, most public organizations have independent websites in western countries and they provide citizens with re-governmentations in its weakest form. Utilization of this kind of technology can reduce official corruption statistics whose origin is providing citizens with information and it can attract public trust with making organizational activities more transparent (7).

3-2- E-government applications

Considering the goals of e-government which are establishment of effective interaction between government and citizens, government and commercial institutes, government and employees and relations inside institutes in more friendly, more appropriate, more transparent and cheaper forms, applications of e-government are classified in four groups which include: interaction of government with citizens (G2C), government with business owners (G2B), government with employees (G2E) and relationship between government and government (G2G).

Furthermore, e-government has many applications to different parts of society. Users can satisfy some of their needs like payment of tax and toll, extension of driving licence, conclusion of a contract, participation in elections, use of virtual library, payment of water and electricity bills, and receiving different information on economic, social, political and cultural issues.

4-2-interaction of government with citizens (G2C)

G2C and vice versa, are the most important and widest type of e-government application. G2C applications are like providing information for people in the form of download, online order and other social service for utilization of public facilities. Therefore, this item concentrates on user and preparation of software packages for presenting e-government service (Ghasemzadeh and Safari, 2003, p 273).

Interaction between government and business owners (G2B):

G2B is an advanced kind of e-government in which a government satisfies the special needs of business owners through internet. This kind of service is very diverse. Business owners, partners and suppliers, customers and sometimes competitors are related to government. Governments are loyal to their commitments concerning increase of efficiency and economic saves although access to online service is not acceptable for some business owners.

Government and employees interaction (G2E)

Government's service provided for employees through internet or private network in order to access to human resource information like personnel perks, pension, salary and wage, loans and other service. This effective method is used to facilitate e-learning and in order to improve management knowledge. In fact, such applications are not accessible over internet but they are accessible through a private network or public internet.

Interaction of government and government

Public organizations are dependent on each other for offering service to other public institutes, electronic interactions are very important among public institutes. This kind of relationship is accessible by means of an intranet or private network. Interaction between government institutes are like documents, information, contractions, and bills and so on which are transferred electronically and this needs a comprehensive and integrated system among public systems. These types of e-government interactions are implemented mostly on internet virtual private networks due to being confidential (West, 2000, p 23).

It can be said that e-government is used widely today. Improvement of efficiency, improvement of transparency and responsiveness to international, local and national changes, relationship with citizens and businessmen are among ITC applications and utilization of networks transforms the base of many activities.

Necessary infrastructure for development of e-government in Iran

Establishment of e-government in Iran will face governors with new challenges besides its positive outcomes, like other developing countries. In many developing countries, e-government is being sought. But the problem is that they have not only been persuaded to allocate resources to e-government but they do not know what they should do. It can be said that one reason developing countries have paid less attention to establishment of e-government is that they are not aware of e-government advantages and the other reason might be that they do not have the necessary infrastructure for this. In the first stage, governors must use other countries experiences and become aware of e-government advantages and in the next step, they must establish necessary managerial, technical, social, le-governmental, human and cultural infrastructure and this second step is considered as an important stage in establishment of e-government. In the next part, necessary infrastructure for developing e-government is presented. This model, offers 5 platforms:

1. Managerial infrastructure
2. Technical infrastructure
3. Human resource infrastructure
4. socio-cultural infrastructure
5. le-governmental-law Infrastructure

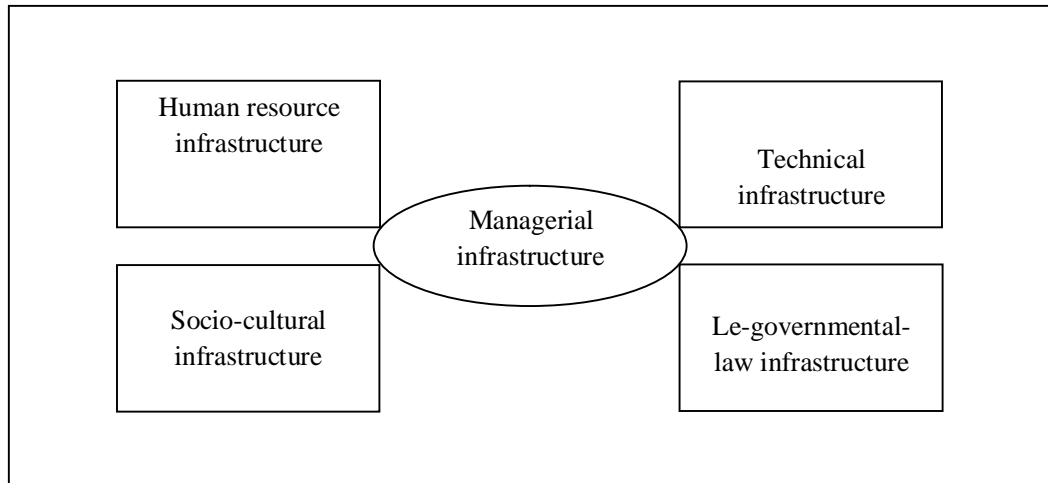


Figure 1. Model of necessary infrastructure for development of e-government

Figure 1 shows that managerial infrastructure is at the center of platforms which are necessary for establishment of e-government. Success level of each of the infrastructures is dependent on a series of action that follow.

1. Managerial infrastructure

This platform facilitates other platforms activity and their systematic development. Experiences of developed countries indicate that development of ITC involves comprehensive planning and management and the following measures can play important roles in establishing managerial platform:

1. presence of centers for guiding IT activities in national level like:
 - a) ministry of ICT
 - b) Supreme council of ITC
 - c) National committee of ITC

Presence of a center for guiding ITC activities can specify government's approach to e-government and plan for e-government establishment. Preparation of an executive management structure and process of supervision on the growth and development of e-government will be among the duties of this center.

2) Specification of management approach of the country to e-government

It is natural that when ITC is viewed as a social and economic factor, e-government, which is based on ITC, will be a step towards social and economic development and will strengthen competitiveness in global economic arena and will help progress socio-economic development goals.

Preparation of national plan and prospect for establishing e-government

One of the main parts of each plan is determination of a prospect for it. A national prospect is a vision that any country tries to reach it in future. In fact, e-government prospect reflects a country's ideals and ambitions in the field of access to e-government and it is a favorable point towards which all attempts and resources must be directed.

4. Government can play a facilitating role in implementation of e-government:

- a) Allocation of budget to support development of ITC necessary for establishment of e-government.
- b) Establishment of facilities in order to attract direct external investments in IT industry.
- c) Contribution to the growth and development of active units in ITC field through establishment of incubators.

2. Technical infrastructure

Technical infrastructure includes technologies and standards. All development measures in this field have taken place in developed countries like USA and England. Technical-relational platform is a facilitator of general progress in communications and particularly in e-communications. Weakness in this sub-structure can face activities related to e-government with challenge. Development of technical and information infrastructures is important for joining global society. Citizens and business owners will be deprived of active participation in information revolution of 21st century without safe connection to internal and external information networks. Therefore, policy-makers of these countries must look for establishment of circumstances to develop relationship-information networks in order to facilitate citizens access to information. Some activities which can be helpful in this case are as follows:

- 1. Establishment of information platforms which are necessary for Iran
- 2. Establishment of international connection through optical Fiber lines
- 3. Development and improvement of the quality of internet service providers.
- 4. Improvement of long-distance relationships service and reduction in its tariffs
- 5. Establishment of necessary platforms for offering e-payment service in e-government.
- 6. Development of mobile phone lines and personal computers
- 7. Establishment of technology parks and ITC incubators for development of e-government
- 8. Increase in national Band Width
- 9. Provision of network safety service

Development of technical platform in national level, needs suitable investments. This platform is the most expensive activity of all five e-government platforms.

3. Human resource infrastructure

Having well-trained and skilled human resource in the field of ITC plays an important role in the success of e-government project. If in the previous decades, someone without familiarity with computer was considered as illiterate, today a person who can not use internet is called illiterate. Human resource platform must be prepared so that it familiarizes people with ITC and it also provides human resource expert in the field of ITC for establishment of e-government projects.

The following measures can be suitable for establishment of appropriate human resource platform for implementation of e-government projects in commerce sector:

- equipment of institutes with ICT
- development of majors related to ICT in universities
- establishment of seminars and conferences related to e-government in national level
- development of technical-professional centers in the field of ICT
- presenting training during service for managers and government employees in the fields related to e-government

Skillful human resource can be a success key for development of establishment of e-government and development of e-government infrastructures need skillful managers and employees and this is also necessary for workers. Some countries use this important resource and in contrast, some other countries including some developing countries do not have this resource.

Therefore, wide policies and investments are necessary in relation to specialized trainings concerning e-government so that competent human resource will be trained for e-government. In fact, individuals and employees in commercial sector and even managers must receive necessary training before establishment of e-government.

4. socio-cultural infrastructure

Introduction of new technologies to national level needs preparation of socio-cultural infrastructure. Development of internet and satellite technology has prompted new challenges. Without appropriate cultural

platform one can not hope for proper use of various technologies and especially internet. On the other hand, ignorance of appropriate social platform will result in digital gap which is of the symbols of inequity in the present communications era. One of the problems which seems to be ahead of e-government establishment in Iran and in its commercial sector is that citizens and government employees have the habit of "face-to-face" habit and they are adapted to being physically present in offices and many works which can be done through a short telephone contact may take several hours of citizens and besides that, it results in high costs both for government and citizens. One of the reasons for this is lack of reliance to e-communications. The other reason is the behavior of government employees who do not tend to carry out citizens works through telephone and other communication means like internet and do not view responsiveness towards citizens as their duty. In order to establish a socio-cultural platform, the following measures can help a lot:

- improvement of culture of using internet technologies in national level
- implementation of teaching programs in the field of communications-information
- distribution of ITC facilities nationwide in order to prevent from digital gap

5- le-governmental-law infrastructure

Le-governmental platform is an important matter which must be considered while formulating e-government project because re-governmentations related to e-government can influence on e-government performance. Tax and customs re-governmentations can be mentioned as examples.

With the emergence of digital economy, commercial applications which are based on network and internet have also become prevalent. We need to have a safe and le-governmental environment in order to implement e-government project. Some actions which can be taken in this field are as follows:

Internet crimes rules, establishment of safe electronic transactions centers, establishment of centers for solving internet claims.

Electronic chaos will be expectable if an appropriate le-governmental platform is not established for e-government development. [9]

Managerial factors affecting development of e-government infrastructure in Iranian commerce sector

Undoubtedly, implementation of ICT in the present organizations especially in commerce sector will not help government modernize and will not contribute to establishment of e-government. Although e-government project has been designed in the ICT era, it must be said that this goal is not achievable only through technology. In other words, development of appropriate infrastructure for establishment of e-government is more important than technology. The most important obstacles ahead of e-government formation are managerial problems because e-government is nothing but a tool for serving people through electronic platforms. In this case, all information needed by citizens must be prepared so that every person can access this information without physically referring to organizations. In his opinion, problems concerning access to information by citizens can be traced back to managerial and social and cultural infrastructures and e-government will not form until these problems are solved. Commerce sector is the governor of e-commerce in Iran and more than other sectors, it needs correct management and exact planning for implementation of e-government. Therefore, we must prepare technical and managerial infrastructure in order to be able to establish e-government. Now this question can be propounded which technical and managerial factors affect development of suitable infrastructure for e-government establishment? In the next part, these factors are investigated for short.

1. Presence of a comprehensive planning:

Undoubtedly, the progress of technology and advanced communication systems necessitates presence of proper planning by managers for their organizations and managers must pay attention to planning as an effective tool for management and leadership.

Commerce sector needs high-rank managers support and it must be cared about in the fourth development plan of Iran and in the 20-year prospect. Therefore, establishment of e-government especially in commerce sector requires state-governmentic planning and management in organizational structures. Moreover, commercial sector must use experts advices in the fields of policy-making, project management, IT, state-governmentic planning and so on from public and private sector in the form of state-governmentic and specialized commissions. Therefore, government organizations managers and especially commerce sectors managers must take an appropriate approach and support development plans and put the plans into action. [10]

2. Appropriate organizing

An organization is designed for achieving predetermined goals and becomes dynamic by division of duties in the form of organizational units, determination of hierarchy, responsibilities and specification of communications. [11] After implementation of e-government project, organizational structures change and become smooth, boundaries and units become less important and all organizational activities become horizontal. In this case, duties and activities are designed based on information networks and employees do not

need to be present physically at their working office. Organizational tasks are carried out in on-line form and organizations management contact their customers without intermediation and are in non-concentrated form. High-rank managers are expected to be persuaded to change traditional organizational structures with designing e-government (especially in commerce sector) and reduce concentration on decision-making. Therefore, information flow will become more transparent and appropriate structures will be designed for implementation of e-government.

3. on-time control and supervision:

Control is a process through which planners check the concordance level of real activities with planned activities. In fact, control and supervision are tools for becoming aware of the way of doing activities and pre-planned programs. It is necessary for managers to control over the implementation of plans if we want to properly implement e-government especially in commerce sector. It is also important to design supervision re-governmentations necessary for conducting e-government processes so that e-government will be implemented in a specified framework. [12]

4. Effective guidance and leadership

Leadership is the art of influencing others so that they try to achieve group goals in an interesting way. Effective leadership and guidance play important roles in implementation of e-government from definition of infrastructure to final implementation.

Commerce sector has an important duty in e-commerce field and its effective management and leadership will help better implementation of e-government. Presences of a powerful leadership can double the interest and motivation of employees for establishment of e-government.

Technical factors that affect development of e-government infrastructure in Iranian Commerce sector

E-government is not restricted to giving a computer to employees and managers in an organization to do their tasks, but it is changing government service providing process by means of ICT so that citizens will have access to information in an easy way. Although the roles of other factors like managerial, socio-cultural and human factors cannot be ignored in development of e-government infrastructure but presence of powerful technical infrastructure is a base for establishment of e-government. For example, if the optical fibre network capacity of Iran is limited then spread of internet(as the main tool for developing e-commerce and e-government) will be hindered. In fact, it can be said that one of the main bases for e-government is new communication tools and appropriate communication infrastructure is a necessity. Development of such structures need huge investments due to their costly nature. Moreover, development of other technical factors like computer hardware and software, telecommunication senders and receivers, information databases and so on are among equipment that help develop e-government in Iranian commerce sector. Therefore, commerce sector must improve awareness level of managers and employees so that it can create a small knowledge-based community and individuals in such a community must be able to use new communication instruments, especially internet. According to the discussion, infrastructures necessary for development of e-government in Iranian commerce sector were identified by means of Doctor Abdollah Zadeh's model of "5 infrastructure platforms necessary for development of national ICT". His model contains managerial, technical, human resource, socio-cultural, and le-governmental-law infrastructure. Then, the researchers try to identify the most important managerial and technical factors that affect development of e-government infrastructure considering the specific situation of Iranian commerce sector. Finally, questionnaire and interview were used as data gathering tool to ask experts opinions about importance level and impact of dimensions and each of the factors affecting e-government infrastructures in Iranian commerce sector were analyzed and they were rejected or verified by means of scientific methods and these analyses and their results follow in the next part. Research goals

The aim of this research is the investigation of fctors affecting (especially managerial and technical factors) development of e-government infrastructures in Iranian commerce sector which can help policy-makers to plan more effectively in order to implement e-government in commercial sector of Iran.

Research hypotheses

Considering the former part (statement of problem and research importance), two main hypotheses and 6 subsidiary hypotheses were formed as follows:

Main hypotheses

1. Managerial factors influence on the development of e-government infrastructure in Iranian commerce sector.
2. Technical factors influence on the development of e-government infrastructure in Iranian commerce sector.

Subsidiary hypotheses of the research:

1. Managers' opinions on fulfillment of e-government goals influence on the development of e-government infrastructure in Iranian commerce sector.
2. managers' planning's for implementation of e-government influence on the development of e-government infrastructure in Iranian commerce sector.

3. Organizing style in Iranian commerce sector influence on the development of e-government infrastructure in Iranian commerce sector.
4. Managers' leadership style influences on the development of e-government infrastructure in Iranian commerce sector.
5. Presence of ICT technologies influences on the development of e-government infrastructure in Iranian commerce sector.
6. Presence of competent work force influences on the development of e-government infrastructure in Iranian commerce sector.

RESEARCH METHODOLOGY

The present research method is descriptive because the researchers try to gather data on e-government and identify factors affecting development of e-government infrastructure and its importance level from experts point of view. Questionnaires which were made by researchers were distributed among sample members and then the results were generalized to population. Therefore, survey method was used for this research data gathering process.

Data gathering method

In the present research, data was gathered through library studies (books, and digital techniques) and other methods like (interview with experts and distribution and analysis of questionnaire). Data analysis was conducted by SPSS software.

Population

Population of the present research included all managers, experts and commentators in Iranian commerce sector who live in Tehran and are familiar with e-government. The researchers went to Trade Ministry center for studies and research, ministry of economy and supreme information council secretariat and Iranian Customs in order to identify and estimate sample size. 58 people were selected and Cochran's formula was used to determine sample size:

$$n = \frac{Nz^2a_1p(1-p')}{E^2(N-1) + z^2a_1p(1-p)}$$

Where:

1. N is the population size which is equal to 58 and n is sample size which is equal to 40 people.
2. Z is standard distribution statistic in 95% level of certainty and is equal to 1.96.
3. P is success ratio
4. q is failure ratio
5. E is researcher error which is equal to 0.09% in this research based on similar studies.

Sampling method and statistical sample

In the present research, systematic stratified sampling method was used to determine sample members and statistical parameters were determined in a way that sample results were generalizable to population.

Statistical methods in data analysis

Descriptive analysis tools like tables and frequency distribution graphs were used to measure sample parameters and inference statistics methods like inference statistics were used to help draw conclusions on population.

Data gathering tool

Questionnaire was used as data gathering tool and for measuring experts opinions on the development of e-government infrastructure. First, exploration interviews were conducted with experts and IT specialists and some primary studies were conducted in order to formulate questionnaire questions. The questions were designed in two parts of personal characteristics and questions related to research hypothesis analysis.

Primary test questionnaire was used in order to determine questionnaire validity. Primary questionnaires were distributed among 20 % of sample members and irrelevant questions were revised or deleted. Then, the questionnaire which was made by researchers was distributed among sample members. This final questionnaire contained 30 questions each having 5 choices designed in Likert scale and range from very little to very much. This questionnaire also consisted of 6 sub-scales and the questions were related to (planning, organizing, supervision, leadership, IT and expert forces), respectively.

In addition to descriptive tools like central tendency indices, scattering indices and distribution indices, Lee Hei method was used effective factors were ranked. Furthermore, one-sample t test was used to conduct inferential analysis and hypotheses test ($df=n-1$) and all questions and sub-scales were analyzed. In order to do

complementary investigation and study research variables relationship with demographic characteristics (academic major, age, gender, education, familiarity with IT), t model was used and for education level, one-way variance was used, and for comparison of managerial factors and technical factors in three groups (computer, management and other), inferential analysis methods were used. Furthermore, multi-variate regression model was used to predict managerial and technical factors through age and familiarity with IT variables.

According to research hypotheses test, managerial and technical factors affecting e-government infrastructure in commerce sector were tested and the following results were obtained:

Investigation of questions results concerning subscales (planning, organizing, supervision, leadership, IT and expert forces) and hypotheses tests showed that:

1. Planning was recognized as effective in e-government infrastructure development in Iranian commerce sector and the concerning hypothesis was verified by sample.

2. The hypothesis concerning organizing impact on development of e-government is greater than average, i.e., it is verified by research sample. However, in the question related to influence of above factors on e-government infrastructure it is average, and with an average equal to 4, the concerning hypothesis was not verified by research sample.

3. Investigation of the present condition of questions related to the influence of supervision of managers on e-government implementation, empirical average is greater than theoretical average and this shows that the influence of supervision on e-government infrastructure is verified by sample. However, the questions that were related to high-rank managers' direct supervision on e-government implementation and formulation of supervisory regulations for e-government implementation, the empirical and theoretical means were the same and the concerning hypothesis is not verified by research sample with a mean equal to 4.

4. Investigation of the present condition of questions related to leadership style showed that empirical mean was greater than theoretical mean and this shows that the influence of factors on development of e-government infrastructure is greater than average, i.e. it is verified by research sample.

5. Investigation of questions related to IT sub-scale showed that empirical mean was greater than theoretical mean and this shows that the influence of IT on development of e-government infrastructure is greater than average. In other words, it is verified by research sample.

6. Investigation of questions related to expert forces sub-scale showed that the empirical mean for this item is greater than theoretical mean and this shows that the influence of the factors on development of e-government infrastructure is greater than average. In other words, it is verified by research sample.

7. Investigation of the questions related to management sub-scale showed that the empirical mean was greater than theoretical mean and the hypothesis is verified by research sample.

8. investigation of questions related to technical factors showed that the influence of technical factors on development of e-government infrastructure is greater than average because empirical means is greater than theoretical means and the concerning hypothesis is verified by research sample.

Results of demographic variables

These results (the last academic degree of sample members, major of the last academic degree, and activity experience in the field of ITC) have been summarized in tables 1, 2 and 3.

Table of frequency distribution, number 1, investigation of academic major in research sample

row	major	frequency	percentage
1	Business management	10	33/3
2	economy	2	6/7
3	computer	12	40
4	industries	1	3/3
5	chemistry	1	3/4
6	statistics	1	3/3
7	IT	2	6/7
8	Librarianship and information	1	3/3
Total sum		30	100

Table of distribution of respondents' base on the last academic degree

Last academic degree	frequency	frequency %	cumulative % frequency
PhD	4		13/3
Master degree	8		26/7
Bachelor degree	18		60
Total sum	30		100

Table 3. distribution of respondents based on their experience of activity in the field of ITC

Experience of activity	frequency	Cumulative frequency percentage
Below 5 years	22	73/3
6 to 10 years	5	16/7
11 to 15 years	3	10
Total sum	30	100

Table 4. distribution of respondents based on gender

levels	frequency	percentage
woman	13	43/3
man	17	56/7
Ttal sum	30	100

minimum	maximum	Standard deviation	mean	Index Sub-scale
6	15	2.17	29.63	supervision
23	30	2.01	12	planning
7	15	1.58	12	organizing
7	14	1.94	11.26	Leadership style
21	34	3.51	31.73	IT
16	28	3.10	22.76	Expert forces
1	5	0.38	4.15	Managerial
1	5	0.32	4.14	Technical-instrumental

Table of investigation of sub-scales in research samples

Distribution indices		Scattering indices			Central tendency indices			Sub scale	
Skewedness	Standard error	Standard deviation	Variance	Domain of changes	Mean	Median	mode		
0.05	-0.52	0.39	2.17	4.72	9	29.63	30	30	Supervision
-1	-0.27	0.36	2.01	4.06	7	12	12	13	Planning
0.35	-0.76	0.33	1.58	3.44	8	12	12	12	Organizing
0.25	-0.22	0.35	1.94	3.78	8	11.26	11.50	12	Leadership scale
-0.61	-0.11	0.64	3.51	12.34	13	31.73	32	33	IT
-0.21	-0.33	0.56	3.10	9.63	12	22.76	23	24	Expert forces
0.56	0.11	0.07	0.38	0.14	1.39	4.15	4.26	4.26	Managerial factors
0.45	-0.68	0.05	0.32	0.10	1.50	4.14	4.16	4.16	Technical instrumental factors

Conclusion and recommendations

In the present research, two fundamental approaches to e-government development in Iran were considered. One of them emphasized on infrastructure development and requires that first, processes and circulation of tasks must be mechanized and improved. Then, necessary platforms must be provided and service offering must be facilitated. The second approach emphasized on requirements and believes that infrastructures will be inevitably provided by government and it recommends that all attempts must be concentrated on electronic service providing. It seems that a development plan must be a combination of both approaches and improvement and mechanization of information systems must be accompanied by movement towards e-service providing for people.

According to the results, some solutions are presented for facilitation of development process of e-government infrastructure:

- Coordination of economic-commercial structures and avoiding from government scattering which usually result in missed opportunities and incurring high costs.
- Reduction in public-owned e-service. Because the Iranian government gets involved in every fields, state-owned organizations and service must be reduced.
- Citizens' opinions on information provision and public sector service must be considered.
- Adoption of a state-governmentic approach to development of e-government platforms must be considered by managers. Development of e-government infrastructures must be a long-term process, because government reforms in information era will remain under the influence of primary approaches in the short term. Therefore, not only government potential goals go wrong, but also many of these plans for government reform will face failure and defeat.

- Activities and tasks must be organized based on processes and not duty. Therefore, organizations scattered units are reduced and inter-governmentalized and an important step is taken towards customers opinion. Furthermore, methods of doing activities and processes are reformed in organizations and some of them are reduced or eliminated (structures engineering).
- Information systems must be used in public organizations in order to facilitate inter-governmentalization and e-government implementation in such organizations. Use of <<human resource planning>> software is one of these systems which can be used helpfully. This software allows organizations to attach different processes and parts and provide adequate information for decision-making.
- A strategic and guaranteed document must be prepared in order to plan for development of e-government infrastructure in Iran. It must be noted that formulation of an appropriate model for ITC-based development is necessary.
- Improvement and correction of technical-instrumental infrastructures of Iran must be conducted in a way that all users all over the country can access to computer communications with high speed.
- Service and information provision should be organized based on essential events. Therefore, customers' expectations and needs are satisfied and a clear prospect will be imaginable for integration of tasks and affairs.
- Managers' viewpoint towards e-government and clarification of the importance of e-government infrastructures is a must. Qualitative and quantitative development of expert forces in e-government sector and in order to develop platforms. Two factors must be considered (shortage in internal specialist and low quality of internal experts' technical knowledge was considered as the least important factors from many respondents' opinions. But organizations must focus on education of internal state and official forces, increase in universities admission rate, use of Iranian experts who live abroad and increase in internal experts who work at managerial positions and basic needs must be provided in the framework of 20-year Iran prospect.

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