E-Readiness Assessment

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Abstract: *e-readiness is a relatively new concept due to the growth of internet penetration in the world and also the creation of dramatic advances in the use of information technology in business, industry, services, education and other fields, in many countries has-been considered. In this review it is tried to use the Mutula and van Brakel e-readiness model preparation of a number of executive agencies in Mashhad as the second largest city in Iran (Khorasan Razavi Province), with emphasis on access to information, is assessed.*
For this purpose, using a questionnaire designed and interview techniques, information required in connection with any of the original model includes organizational readiness, information readiness, infrastructure readiness, human resources readiness and external environment readiness is collected.
The results show executive agencies selected in the areas of preparation of human resources, organizational readiness and preparedness are infrastructurally deficient. But the Department of Customs, Department of Posts, and Science and Technology Park are front runners and superior; and this seemed more prominent in preparation, infrastructure readiness and organizational readiness. However, the Office of Civil Registration, Department of Education and Department of Technical and Vocational Education has the worst possible conditions for e-readiness

Keywords: e-readiness; information technology; organizational readiness; information readiness; infrastructure readiness; human resources readiness; external environment readiness

1. Introduction

Rapid development of internet and substantial development in utilizing IT in business, industry, services and training has drawn intensive attention and interest of developed and also developing countries toward electronic readiness. The conception of electronic readiness has been developed and expanded during 1990s to propose an identical framework to assess the spread and percolation of digital section in massive level. As a consequence, various tools of electronic readiness assessment have been designed and employed by different organizations and companies. As a matter of fact, each of these corporations claim that their assessment method and means are able of subtler evaluation and better recognition of current situation and could instruct organs in progression within information and information technology arena[1]. Concerning the importance of electronic readiness as a crucial prerequisite for prosperity in IT realm, we were determined to assess the extent of electronic readiness of some executive administrations in Mashhad, the second biggest city of Iran and the capital of Khorasan-e Razavi Province, based upon a model suggested by Mutula & van Brakel. Results obtained from this study revealed that almost in all of these organs no appropriate foundation has been prepared organizationally to enter into IT realm. Furthermore, these authorities have inadequacies in needed data and endorsement with regard to their human resources. And last but not least, settings around these organizations lack efficient circumstances of their activities.

2. Electronic Readiness

Individual organizations and researchers have different views on occupations related to internet, information technology and electronic readiness, and every group defines these issues in accord with its view. It should be noted that the concept of electronic readiness takes on multiple diverse meanings for various individuals in different contexts and frameworks and for several purposes.

Choucri et al. declared in their observations that owing to devoid of agreement on definition of electronic readiness, there is a great gulf between ideas and concepts on one side, and applications and applied perception of these concepts on the other [2]. Among others, Computer System Policy Project (CSPP) group, comprised of American companies in context of IT, was the first organization that used the concept of electronic readiness. This organization in its assessment method, introduced in 1998 as "A Guide for Living in Network World", defined electronic readiness as following: a society in which there is continuous and fast availability to competitive market for its people, and the use of information and communication technologies in schools, universities, government offices, businesses, service and health organizations, etc is common. Meanwhile in such societies, users have privacy in using internet, possess strict data security and finally there are suitable

government policies for use of and connection to networks.

Subsequently, International Development Center of Harvard University, as the second organization, proposed its assessment method for electronic readiness entitled "readiness for network world". This center prescribes electronic readiness as: a society with proper physical infrastructures that brings in amalgamation and unification of information and communication technologies in business contexts and has desirable access to internet and information and communication technology for its entire people.

As it concluded from above, various definitions have offered about electronic readiness worldwide, so no agreement has been attained by societies about defining this concept. However, it can be interpreted that in all suggested definitions as for this phenomenon there is a strong emphasis on following matters [3]:

- existence of suitable infrastructures
- existence of training programs for IT
- manner of connection to the network
- outlining the strategic plan of organization
- existing specialists and professionals in IT scope
- bandwidth and degree of internet access

3. Importance of assessing electronic readiness

For various reasons, countries perform evaluation of electronic readiness level in their societies. Indeed, the aim of most of them is joining to the global information society, so as without any limitation, all of individuals would be able to produce, receive, send, utilize and share information for economic, social, political and cultural development of their own societies and organizations [4].

Countries with well-extended data infrastructures that can permit different activities in IT field have more potent competitive advantages for reaching to economic growth and social development. For example, countries such as Denmark, UK, Sweden, Norway, Finland and US, which are among superior ones in ranking of global electronic readiness, have more rigorous business media, and their organizations and companies have been recognized between pioneers in different scopes. Also this is the case for Asian countries including Singapore, Malaysia and Hong Kong, as they demonstrate increasing growth in economic aspects because of holding a high level of electronic readiness [5]. Additionally, several studies have shown that using information and communication technology, different companies and organization could improve their operation and management power, avoid loss of time, enhance the quality of their work and products, increase cost effectiveness, share more information, and provide easy access to the data for all [6].

Also, Economist Intelligence Unit (EIU) in its studies on electronic readiness has deduced that in an information era, achievement in extensive endorsement and unification of technologies like internet, PC, wireless telephone, etc., could have an enormous influence on performance of companies and organizations. This organization also believes that performed assessment on electronic readiness can be used as a mechanism for gathering more precise data in order to help government officials in strategic planning and improving organizations' performance.

Finally, it should be noted that electronic readiness assessment allows managers to identify key opportunities of IT-based development, since it has been proved that an organization should be prepared enough for proper usage of information and communication technology in different issues such as infrastructures, legal and law administrations useful as to utilization manner of information and communication technology, and determining organization's strategy and perspective on IT [5].

4. Methods for assessment of electronic readiness

Until now, many different electronic readiness assessing means and tools have been developed and employed by various organizations in an intense level. It is noteworthy that each of these organizations defines electronic readiness based on entity of its activities and ambience, and has launched designing appropriate method of electronic readiness assessment correspondingly. For example, Asia Pacific Economic Cooperation (APEC) defines electronic readiness as: the degree to which an economy or society has become ready for participation in digital economy. Considering its activity in electronic commerce, and based upon its definition about electronic readiness, this organization proceeds on evaluating below matters for the purpose of measuring electronic readiness quantity in countries and organizations:

- Existence of infrastructures and fundamental technologies
- Amount of individuals' access to the web services
- Extent of internet usage in businesses, government offices, schools and universities
- Extent of using on-line systems for raising sales
- Having skilled and well-trained human resources
- Setting governmental regulations and instructions in commercial and financial affairs
- Existence of legal and juridical frameworks for using in e-commerce

Though, in general electronic readiness assessment methods are categorized as four main methods of using questionnaire, statistical analysis methods, best practices method and historical/chronological analysis of events [3].

5. Drawbacks of electronic readiness assessment methods

Each of tools and methods of electronic readiness assessment has its own weak and strong points. Theoreticians believe that major common drawback in the whole of the available approaches is no usage of them in small scale and lack of emphasis on information access degree for people. Nonetheless, it should be added that all

of these designed tools have some advantages that we won't explore them here.

In the view of information knowledge, data modeling that enable organizations and authorities to organize, store, process and restore information, has a vital significance for experts. Thus, study and research about information readiness of populations must be done with more attention and immediacy. Simultaneously, the way that users make connection with required data sources by existing information systems should not be neglected [7]. In this relation, Holtham also believes that information is more crucial than information technology in order to succeed in every business. However it has been seen that nowadays, the biggest part of assets, time and attention of organs and media managers is devoted to IT. He thinks that continuing this imbalance would be the source of bigger failures in the future.

One minus of current methods of e-readiness assessment was named as utilization in large scale. In other words, these means seek either e-economy or e-society indices. One could say that evaluation tools for e-economy assess the capability of information and communication technologies for affecting economy, and evaluation tools for e-society are concerned with effect of these technologies on society.

Overall, it can be deduced that a far extensive range of methods of e-readiness assessment is used in different countries, and each of them has disadvantages which indicate the increasing necessity of redesigning them. Still at the end of this section, these advantages and disadvantages can be listed for e-readiness assessment methods [3]:

- Non-use in small scale
- Non-use in developing countries
- Lack of attention and focus on information parameter
- Lack of comprehensive guidelines about how to implement and run current models

6. Importance of data access in e-readiness assessment

As mentioned above, one problem of e-readiness assessment methods is lack of attention to the information element. Many studies have carried out on the subject of data access, numbers of which are discussed below. Consulting & Audit Canadian Institute concluded from its investigations that competitiveness of commercial companies round the world is associated with their readiness for using information and communication technologies in order to identify, assemble, organize, process and publicize information efficiently for decision-making. Thom, one of specialists in IT field, supposes that organizations who have dedicated most of their capitals for hardware as storage disks, terminals and even central computers, should be warned that the entire of these technologies are expendable tools. In fact, what they must be seriously concerned about and invest in is information used by these organizations and hardware. He also believes that information is more valuable than technology, and data access, understanding time, and the best use of it, are considered as power sources for organizations.

In other study, Forgione came to this conclusion that information has qualities which are usable for different groups and individuals in various organizations and corporations. So it must be arranged as a critical means for communication and deciding in the hand of executives in all levels, and respect it as invaluable asset. In addition, since different groups and individuals in organization, based upon their state and position, have different needs for information, the necessity of an inclusive information system which is concurrently associated to people position is unquestioned. Similarly, Culnan inferred from his research that one effective factor for using and implementation of information is accessibility. He mentioned that data access is strongly impressive on usage level of data systems and users' evaluation of obtained data, as well. Besides, in their observations on data systems, Hiltz& Johnson reported that optimized usage of these sorts of technologies is often correlated with issues like improving data access, enhancing effectiveness, increasing work quality and efficacies.

By these explanations, it could be stated that information is an important component that in an ideal manner must be the basis and ground for e-readiness assessment means [5].

7. Inclusive model of e-readiness assessment

Despite importance of e-readiness, current methods and approaches couldn't have managed to assess this phenomenon comprehensively and precisely. An overview on e-readiness assessment methods illustrates this problem quite well. Toward this end, following several surveys and considering defects and disadvantages in available approaches, Mutula& van Brakel suggested an inclusive model for assessing e-readiness of organizations. It should be noted that this model, after designing by these two experts, has been used in 2006 in small and medium industries of South Africa. As shown in Fig. 0, the offered model is designed based on five following main parts:

- *Information readiness:* In this division, the quantity of organization readiness in relation to information is evaluated with variables such as existence of comprehensive data bank and amount of internet use in organization, etc.
- *Organization readiness:* In this part, conditions and readiness degree of organization for entering in information area is evaluated by existence of strategic planning, possessing post of information technology management in organization chart, having training programs in the case of IT, etc.
- *Human resources readiness:* In this portion, readiness of organ is assessed considering available human resources and by variables like number of experts in IT field, level of proficiency in computer division officials or specialty of other employees.

- *Infrastructure readiness:* In this part, the quantity of organization readiness in association with appropriate infrastructures is evaluated by variables such as physical space of computer division, having specified website, band width and the manner of network connection.
- *Exterior readiness:* In this sector, the quantity of exterior part of organization is assessed with variables like existence of financial aids, or non-financial supports for assistance in organizational activities.

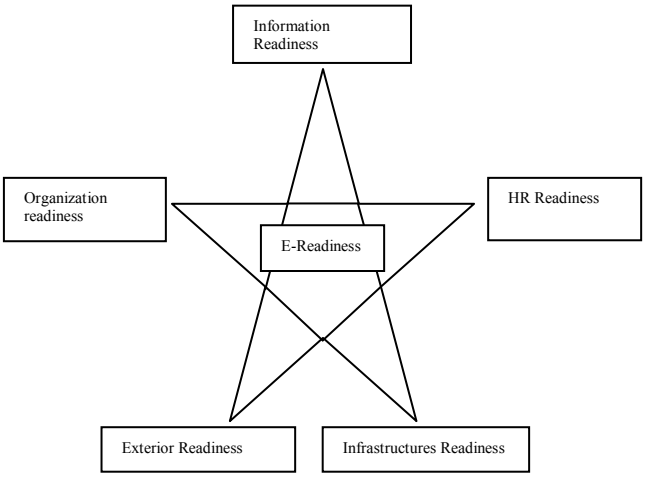

Fig 0. Inclusive model of e-readiness assessment

On the basis of this model, Mutula& van Brakel determined and characterized a general set of variables in each of these sectors, so as organizations are now able to assess their e-readiness by evaluation and measurement of these variables.

It should be noticed that general entity of these variables allows users to undertake alteration and compensation of existent variables corresponding to organization circumstances and ambience. These two researchers also believe that this model has sufficient inclusiveness to such an extent that there's no need to use other models of e-readiness assessment. Indeed, all variables of this model have been chose and identified after studying current e-readiness assessment methods, data populations indices, and models for determination information literacy, including American Federation of Library Association model. In fact, they inferred that this method is based on the fact that information and information literacy are essential and crucial for effective function of people in information population.

The last point about this model is advantages that Mutula& van Brakel are enumerated. In their opinion, beside of comprehensiveness this model puts information component on its main focus, and applicability in small scale and between developing countries. In other word, this model masks all drawbacks of previous models [5].

8. Results

In this analysis, the data needed about research model were gathered through questionnaires and interview techniques from experts of information technology center of intended executive administrations, some of their personnel, IT supervisors in a governmental administration and involved managers and leaders. Also more complete and precise information were collected using a localized model with a kind of software. Afterwards, along with estimating desired indices, progress/upgrading percent of administrations in each main parts of model, and related graphs are extracted. Before proclaiming results, it is needed to state general characteristics of executive administrations that is included in our final obtained results. Table 1 shows these characteristics.

TABLE I. CHARACTERISTICS OF EXECUTIVE ADMINISTRATIONS

Administration	Number of Staffs	Percentage of total statistic population
Custom Administration	572	%8.5
Sports & Youth Administration	304	%4.5
Technical & Vocational Administration	622	%9.3
Registry Administration	489	%7.3
Central Post Office	789	%11.8
Education & Culture Administration	3065	%45.8
Natural Resources Administration	799	%11.9
Science & Technology Park	52	%0.8

In Fig. 1 the state of electronic readiness of executive administrations for the whole of 5 main parts is demonstrated.

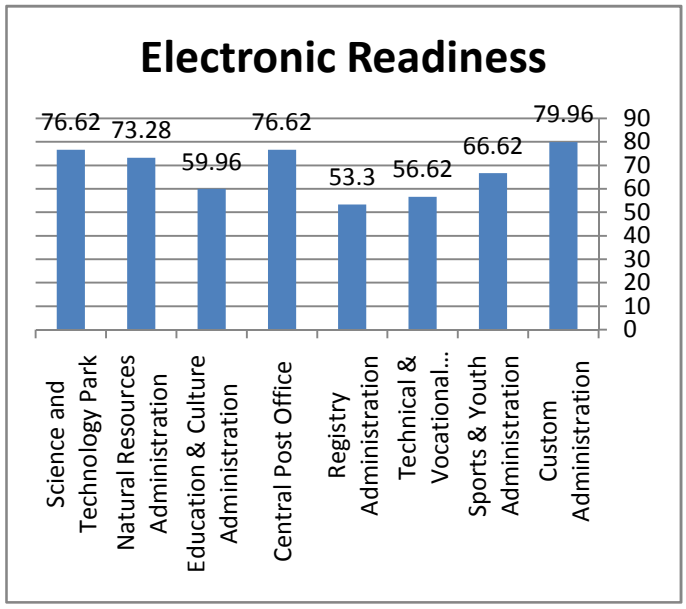

Fig. 1: The whole e-readiness in executive administrations

The gripping point about this figure is that Sports and Youth Administration, which deals mostly with athletic affairs, stands upper than Registry Administration, and Technical and Vocational Administration, which are

generally responsible for registry and educational issues. But for a thorough description and better understanding about situations ahead of executive organizations, their electronic readiness in each part of the model is depicted in subsequent figures. Fig. 2 shows administrations readiness in the organization point of view. It is obvious that Custom Administration, Central Post Office, and science and Technology have the best conditions in this portion, and at the same time Technical and Vocational Administration faces with the worst situation.

Fig. 2: Organization readiness in executive administrations

In Fig. 3 the extents of e-readiness of executive administrations is demonstrated considering available human resources. It is clear that for this parameter, the best situation is assigned for Natural Resources Administration and Science and Technology Park and the worst condition is about Technical and Vocational Administration.

In Fig. 4, level of e-readiness in relation to infrastructures is observed. Here, Custom Administration has the maximum readiness, while Registry Administration has the minimum one.

Fig. 5 shows the extent of exterior readiness of executive administrations. It reveals that the majority of administrations have similar readiness in this case.

In Fig. 6, amount of information readiness is assessed among administrations. You can see that general situation of administrations is also alike here.

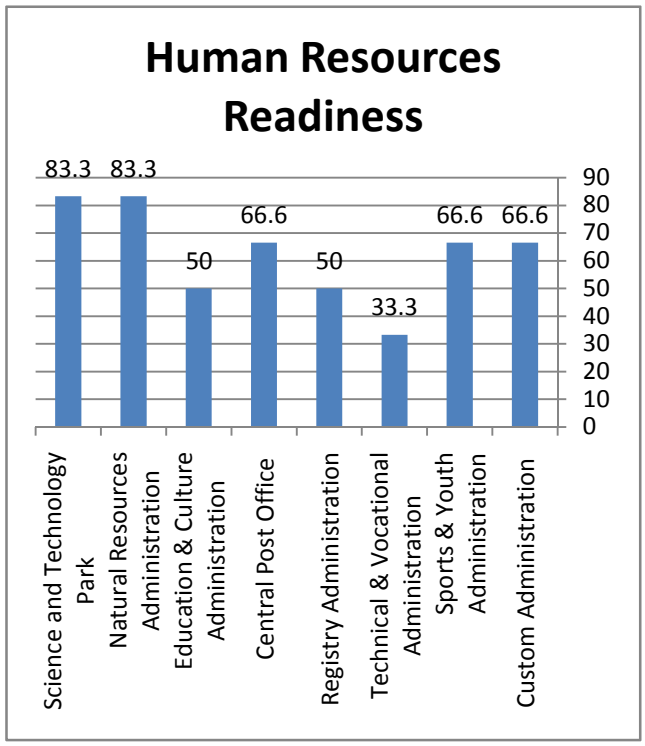

Fig. 3: Human resources readiness in executive administrations

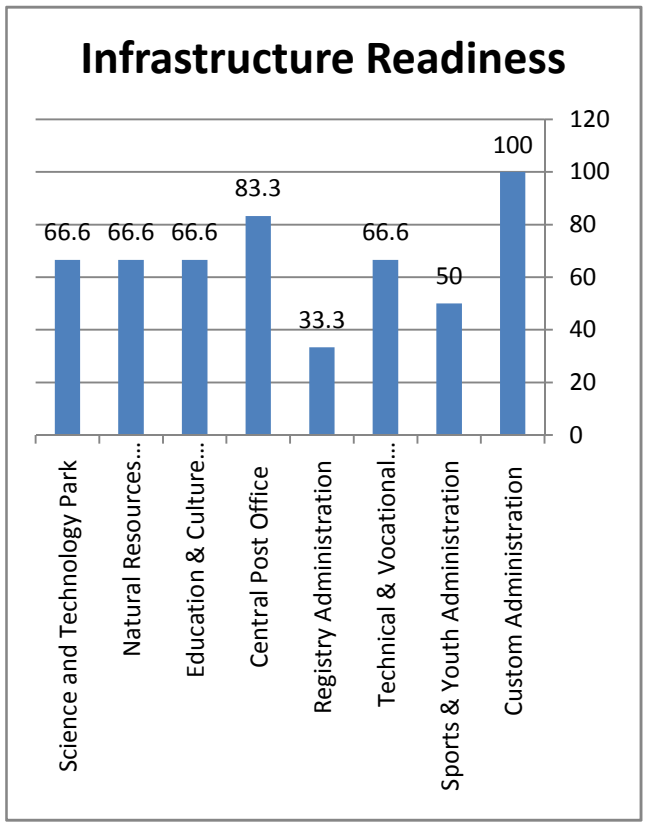

Fig. 4: Infrastructure readiness of executive administrations.

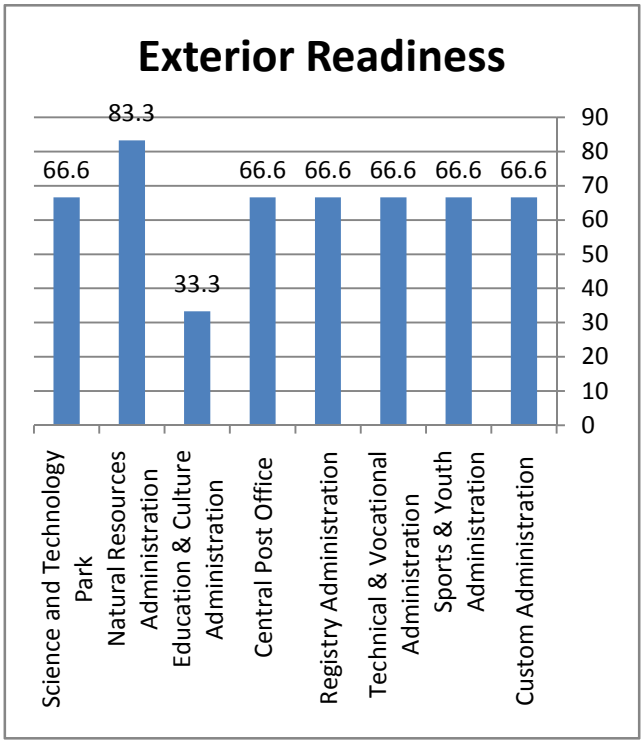

Fig. 5: Exterior readiness of executive administrations.

An overview of Fig. 1 proves that in Custom Administration the condition of e-readiness is better than in other administrations, and Registry Administration has the worst situation.

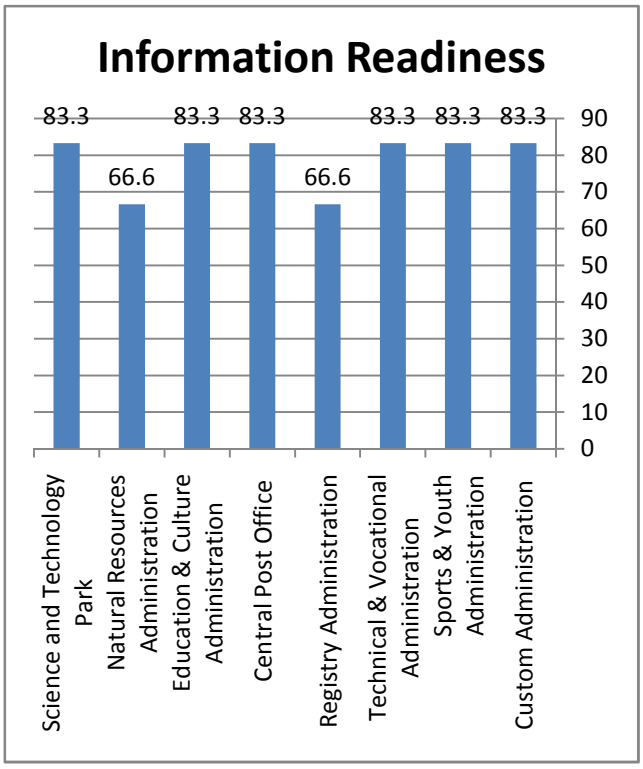

Fig. 6: Information readiness of executive administrations

. Eventually, Fig. 7 demonstrates the state of every evaluated part. It is concluded that administrations have better condition in information readiness than that of other parts. Also one can find that human resources part is still the main problem of administrations.

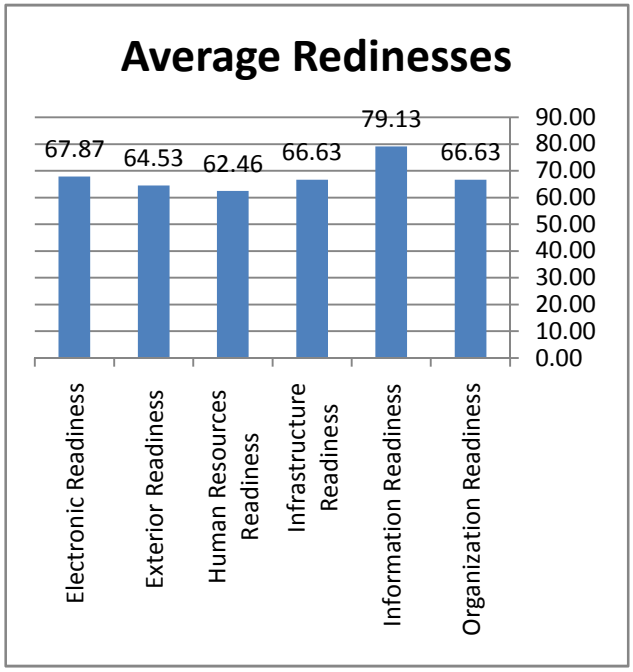

Fig. 7: Average readiness in evaluated divisions.

9. Conclusion

The importance of e-readiness as an essential requisite for entering into information and IT area is completely obvious to everyone. Meanwhile, information plays a special role in this context as a vital source for decision-making. The point that governmental environments must satisfy people's desires and expectation is noteworthy. In this study we found that some of executive administrations organizationally lack required readiness to enter in IT arena, because some of them such as Technical and Vocational Administration have very low readiness, which proves the lack of authorities' attention. After these investigations it was known that many executive administrations have no strategic planning, and also official posts of IT management in their organizational chart, or any arranged job description. In human resources view, that is the major problem of e- readiness, the situation is too substandard. The reason might be that staffs of computer division and related people are deprived from professional certificates and high education for IT and this prevents the progress of executive administrations in IT arena. Finally, the surroundings of these organizations also do not fulfill the expectations of supporting computer activities, so most of these executives have similar and not very favorable conditions. These explanations display that almost all of executive organizations lack suitable foundations for entering into IT scope and this demands authorities' attention and accuracy for supporting computer activities, so as the

executive organizations could perform their main responsibility, namely satisfying citizens, more rigorously.

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