The Relationship Between Information Technology and Organizational Innovation (Case Study: Power Research Institute)

Hamid Noori and Bijan Abdollahi

Facualty of Educational Management, Kharazmi University, Tehran, Iran

Abstract: The aim of this study was to investigate the relationship between information technology and organizational innovation and Power Research Institute in Tehran. The study population has comprised of employees of Tehran Power Research Institute and due to limitations of all personnel, 120 research subjects were selected. The methodology of the research is correlational. To collect data, two questionnaires of organizational innovation of Dysenzo, Hoy and Tarter and information technology questionnaire based on Mo'tamedi model, Gholipour and Cherani were used. Organizational innovation and information technology was obtained by using the opinions of experts and organizational innovation was validated through pilot and calculated Cronbach's alpha coefficient which was 0/89 and for information technology was determined 0/85. Analysis of the data showed that: there is a significant relationship between information technology and energy production and institute of transmission of ideas. And the correlation coefficient is 0.514. There is a significant relationship between information technology and screening ideas. And the correlation coefficient is 0.514. There is a significant relationship between information technology and testing ideas in research power. And the correlation coefficient is 0.342. There is a significant relationship between information technology and the commercialization of ideas in research power. And the correlation coefficient is 0.418. There is a significant relationship between information technology and the commercialization of ideas in research power. And the correlation coefficient is 0.363.

Key words: Information technology, organizational innovation, idea screening, commercialization, idea publication

INTRODUCTION

After World War II, governments and government agencies increased and expanded their economic and social responsibilities (Ahmad and Zink, 1998) and the demand for citizens increased to provide social and economic programs of the government. To respond quickly to the need, governments took action to increase the number of government agencies and the development of information systems in order to increase the reliability and quality of the services. Thus to face these challenges, public sector organizations were open to a range of information technology (Kim and Bretschneider, 2004). Therefore, one of the main issues that government agencies was faced with was the acceptance and the successful implementation of innovations of information technology in order to keep pace with the new technologies (Kim and Bretschneider, 2004; Cardozo *et al.*, 1993).

In the present era, information technology is a new approach to all aspects of human life such as organizations were affected so that corporate image seems impossible without information technology (Fannie and Mosleh, 1386). Use of information technology is as a strategy to develop governance tools and provide better services to citizens referring to government. e-Governments are increasingly becoming a means of providing public services in many world government organizations (Nour *et al.*, 2008). Government agencies have witnessed significant developments in the rapidly changing technology in recent decades. Since, innovation is a key factor in the growth of organization competition and such a development engine that allows organizations to be more efficient in the global economy (Landsbergen and Wolken, 2001), so the government agencies have emerged to benefit from innovation and competitive advantage seeking adoption of IT innovations (Ebrahim and Irani, 2013). Public expectations of the citizens, efficiency improvement, administrative costs reduction and transparency, people's satisfaction, providing quality services to citizens and increasing the speed of delivery of services increase the importance of innovation in information technology for government agencies. In general, the organizations using information

technology are able to create more added value, satisfaction of citizens and improving their efficiency (Fannie and Mosleh, 1386).

The development of information technology in government agencies in developing countries, including Iran, has started distribution activities in setting up e-Government since the entrance years of the internet in late 1370 in the country and TEKFA plan. On one hand, the use and development of the technology is as a national development strategy and on the other hand, extensive government role in the national economy doubled its importance (Fannie and Mosleh, 1386). Although, several studies on the causes of success and innovative technologies failure have been done but the main focus of this study is on the public sector because many of the new technologies in this section have failed for reasons such as the absence of an experienced project manager, lack of understanding of the needs of citizens, not being familiar enough with new innovations, the lack of full understanding of the potential of information technology, relative benefits and management capabilities (Kim and Bretschneider, 2004). At all stages of the innovation process, the need to manage information and knowledge can be seen to use information technology tools for information management.

During the different stages, the innovation process allows organizations to use technological advances in the field of IT for greater efficiency, faster performance. IT tools increase effectiveness of organization to manage the process of innovation and achieve sustainable innovation. Todays, successful organizations use information technology in the innovation process widely and benefits this useful tool. Sustainable innovation has 5 aspects: idea generation, idea screening, testing, commercialization and dissemination and implementation. In the production of idea level, new ideas are generated. A new idea can redefine a policy, change in a process, provide new features to a product or service or develop a new product or service. Ideas must be evaluated when they are generated because all ideas are not worth to test and implement. Screening ideas help the organization to remove the ideas with low probability of success. Then, the screened idea are entered in testing and prototype phase to examine the feasibility and cost-effectiveness. After the testing phase, the feasibility of implementation was checked out in the commercialization stage, the potential impact of implementation of those ideas on the efficiency and organization processes are evaluated and forecasted. The last stage of the innovation process is the implementation and dissemination which is a vital and crucial step for organizations. At this stage, information technology tools are very useful because of the necessity and importance of communication with customers and they can have a supporting role to transfer an innovative product or service to market.

Power research institute is as one of the critical elements in the power and energy industry as one of the best-known and prominent research institute technology development in the field of electricity and energy. NRI philosophy mission includes promoting technology, research development and innovation to increase capacity, competitiveness and productivity of the country's electricity industry and energy. In the institute's values statement, providence and innovation have been raised as core values. Therefore, organizational innovation is necessary for Modern institute. Power Research Institute policy-makers concern is providing innovation policy to achieve development and it seems to be capable to creation and attract organizational innovation capacity utilization in the new era of information technology which is possible. In fact, through information technology, faster innovation with greater efficiency can be achieved.

MATERIALS AND METHODS

This research is descriptive and correlational in terms of nature is practical and in terms of time is cross-sectional, statistical research are experts and researchers of Power Research Institute which according to surveys are conducted by referring to the documentation of the population which is about 120 people. Instrument of IT, IT questionnaire is composed of 9 questions which deals with the status of IT, based on Mo'tamedi, Gholipour and Charani's Model. The second tool to evaluate organizational innovation is based on model of Dysenzo.

RESULTS AND DISCUSSION

There is a significant relationship between information technology and organizational innovation process in energy research (Table 1).

To test both larger than the critical value, 0/05 such correlation is in the range of: as a result, the null hypothesis, that there is no significant relationship between the two variables: information technology and process innovation is rejected. And it is concluded that there is a significant direct relationship between these variables.

Table 1: Test hypotheses 1

The level of significance	The error	Consequence	Correlation coefficient
0.011	0.05	Relationship	0.472

Table 2: Test hypotheses 2

The level of significance	The error	Consequence	Correlation coefficient
0.024	0.05	Relationship	0.514

Table 3: Test hypotheses 3

The level of significance	The error	Consequence	Correlation coefficient
0.001	0.05	Relationship	0.329

Table 4: Test hypotheses 4

The level of significance	The error	Consequence	Correlation coefficient
0.000	0.05	Relationship	0.342

Table 5: Test hypotheses 5

The level of significance	The error	Consequence	Correlation coefficient
0.006	0.05	Relationship	0.418

Table 6: Test hypotheses 6

The level of significance	The error	Consequence	Correlation coefficient
0.000	0.05	Relationship	0.363

Table 7: Abstract model

The standard error of estimate	Adjusted R^2	R^2	R
0/25	0/67	0/67	0/82

There is a significant relationship between information technology and production and transmission of ideas in energy institute (Table 2).

To test both larger than the critical value, 0/05 such correlation is in the range of: as a result, the null hypothesis that there is no significant relationship between the two variables: information technology and the production and transmission of ideas is rejected. And it is concluded that there is a significant direct relationship between these variables.

There is a significant relationship between information technology and screening ideas in energy research Table 3.

To test both larger than the critical value, 0/05 such correlation is in the range of. As a result, the null hypothesis that there is no significant relationship between the two variables: information technology and screening ideas is rejected. And it is concluded that there is a significant direct relationship between these variables.

There is a significant relationship between information technology and testing ideas in energy research (Table 4).

To test both larger than the critical value 0/05 such correlation is in the range of: as a result, the null hypothesis, that there is no significant relationship between the two variables: information technology and testing ideas is rejected. And it is concluded that there is a significant direct relationship between these variables.

There is a significant relationship between information technology and business ideas in energy research (Table 5).

To test both larger than the critical value, 0/05 such correlation is in the range of: as a result, the null hypothesis that there is no significant relationship between the two variables: information technology and business ideas is rejected. And it is concluded that there is a significant direct relationship between these variables.

There is a significant relationship between information technology and implementation and dissemination of ideas in energy research (Table 6).

To test both larger than the critical value, 0/05 such correlation is in the range of: as a result, the null hypothesis, that there is no significant relationship between the two variables: information technology and implementation and dissemination of is rejected. And it is concluded that there is a significant direct relationship between these variables Table 7.

Which is a better predictor of organizational innovation aspects of information technology?: One of the opportunities that new information technologies lie before us is the possibility of using this technology to re-engineer the architecture of government and be more accessible, more efficient. To rule the information of society and its management, e-Government is needed to be created and kept up with new technologies of information. Information society cannot be well managed by traditional structure and processes.

IT innovations, changing expectations of citizens and firms and firms investment in the IT sector are in the category of important factors that should constitute the establishment of e-Government. IT innovations leads to facilitate service delivery to citizens, downsizing the size of government, facilitating information and services by citizens, businesses and organizations related to government and also facilitating business processes and reducing costs through consolidation and elimination of the parallel systems. Creating a culture of creativity and innovation and enhancing the power of thinking and encouraging their employees to provide innovative ideas to create and deliver new services required by the customer will be some of the ways to achieve their goals.

Adoption process of IT innovation, includes consecutive steps that an organization serves before starting to implement a new technology. The original decision occurs on the acceptance of the two-step launch. In the early stages of innovation, the organization gains knowledge from innovation and approach to compliance

which is formed and explored to assess new technology ideas. In another words, first stage involves awareness, consideration and intention.

There is a meaningful relationship between information technology and screening ideas in energy research. And the correlation coefficient is 0.329. Since, innovation is a key factor in the growth of competition and as a development engine that allows organizations to be more efficient in the global economy so the institute of energy have emerged for the benefit of innovation and competitive advantage, seeking adoption of IT innovations. But IT helps staff to achieve essential studies in the shortest time. Public expectations of the citizens and efficiency of improvement reduce administrative costs, transparency, people's satisfaction, providing quality services to citizens and increase the speed of service, the importance of having the most innovative information technology for government agencies. In general, the organizations are using information technology in order to create more added value, satisfaction of citizens and improving their efficiency. There is a meaningful relationship between information technology and testing ideas in energy research. And the correlation coefficient is 0.342. This means that freedom for new ideas and members is provided in the organization. The possibility of offering new ideas for members is provided by the standard of organizational processes and operating sequences. Authority for the staff is to provide new ideas in all parts of the organization. Organization has provided members tend to offer new ideas by removing organizational hierarchy and staff informal communication has increased new ideas and ideas convey. This was also confirmed in research literature. Testing ideas is a difficult and costly process and yet critical. We can facilitate the process of testing ideas and to reduce costs by use of new technologies in information technology such as computer simulation. There is a meaningful relationship between information technology and the implementation and dissemination of ideas on power research. And the correlation coefficient is 0.363. This means that the organization provides possibility of access to the last experiences and new ideas for products and services offered in the world. Organization provide possibility of changing and maturity of members ideas by providing infrastructure facilities. Organization which provides the field of purification and selection of ideas is more likely to succeed by providing links between different sectors of organization to provide expression of possible weaknesses with new ideas provided by the members of the organization through communication between the different sectors. Managers can seek help in screening and ranking new ideas for the moment. Despite the

organizational infrastructure, organization costly tests and difficult ideas, computer simulations are easily. There is a significant relationship between information technology and the commercialization of ideas in power research. And the correlation coefficient is 0.418. This means that organization tests its new ideas through initial testing by external customers and professionals. Managers provide virtual market conditions to buy and sell virtual ideas to make best ideas of commercialization to product.

CONCLUSION

Organization sells new ideas and comments to competing organizations as a product. Organization introduces new ideas and distribute product to customers. Organizations which communicate with their customers and operate their opinions, if necessary will overcome their weaknesses.

SUGGESTIONS

Providing the necessary infrastructure in information technology to organizational innovation: Power research institute senior management should provide necessary infrastructure in order to implement five dimensions of organizational innovation process so employees can use their benefit at every stage of the innovation of information technology.

ICT training courses should be offered for training specialists in the field of information technology to create jobs in order to make quick innovation with the fewest mistakes.

Increase of information systems through: Bank software includes information from producers of knowledge, knowledge resources and knowledge users and .... preparation and serving the public interest.

Managers should try to create a combination of challenging and supportive environment to enhance individual creativity and organizational innovation. Creativity and changing atmosphere will support the development, uptake and use of approaches, processes with new and different concepts and encourage creation, review and use of products, services and new working methods.

Senior management support of staff innovation: Managers encourage innovativeness value. In general, we can say that due to its statements of innovative mission and vision, structure centered on innovation, assigned resources and channels for the production and use of ideas and creating a culture of variability are some of the factors that should be considered in the first place by

managers. Also, more attention of power research institute should be devoted to the independence of the units and individuals which is one of the cases in which the results of this study can be recommended because this aspect can affect Institute innovativeness according to existing theories.

REFERENCES

Ahmad, A.A.A. and S.D. Zink, 1998. Information technology adoption in Jordanian public sector organizations. J. Government Inf., 25: 117-134.

Cardozo, R., K. McLaughlin, B. Harmon, P. Reynolds and B. Miller, 1993. Product-Market choices and growth of new businesses. J. Prod. Innovation Manage., 10: 331-340.

Ebrahim, Z. and Z. Irani, 2013. E-government adoption: Architecture and barriers. Bus. Process Manage. J., 11: 589-611.

Fannie. A. and A. Mosleh, 1386. Structural and managerial factors affecting information technology in bushehr government agencies. J. Humanities lecturer, 11: 157-182.

Kim, H.J. and S. Bretschneider, 2004. Local government information technology capacity: An exploratory theory. Proceedings of the 2004. 37th Annual Hawaii International Conference on System Sciences, January 5-8, 2004, IEEE, New York, USA., ISBN: 0-7695-2056-1, pp: 1-10.

Landsbergen, Jr. D. and G. Wolken Jr., 2001. Realizing the promise: Government information systems and the fourth generation of information technology. Public Admin. Rev., 61: 206-220.

Nour, M.A., A.A. AbdelRahman and A. Fadlalla, 2008. A context-based integrative framework for e-government initiatives. Government Inf. Q., 25: 448-461.