

Proposed E-government Foresight Framework in Developing Countries, A Systematic Approach

Fatemeh Saghafi

Iran Telecommunication Research Center, Tehran, Iran

Email: saghafi@itrc.ac.ir

Kolsoom Abbasi Shahkooh , Akbar Kary Dolat Abadi and Behrouz Zarei

Iran Telecommunication Research Center , Shahid Sattari University, Tehran University, Tehran, Iran

Email: abbasi@itrc.ac.ir, kary_akbar@yahoo.com, bzarei@ut.ac.ir

Abstract— E-government foresight is a major issues for many countries. It is a systematic approach for looking into the long-term futures. E-government initiatives are currently at a stage of integration and new orientation in developing countries. Smaller steps of government modernization have in part been successfully implemented; larger ones still lie ahead of us. This demands a framework for e-government foresight studies. This paper proposes a conceptual framework for the e-government foresight. Firstly, the main components of foresight from different foresight frameworks were identified using meta-synthesis approach. Then, expert's opinion about identified components are collected and validated. The e-government foresight framework was proposed based on the Zachman architecture framework. Finally, appropriate activities and methods for conducting each stages of the framework are summarized. The implications of the results addressed a range of main issues such as dedicated framework, increased internal communication and knowledge sharing, and enhanced project management effectiveness.

Index Terms—foresight, e-government, framework, zachman

I. INTRODUCTION

E-governance involves the use of information and communication technologies (ICTs) to transact the business of government. ICTs created a networked structure for quality delivery of services, efficiency and effectiveness, decentralization, transparency, and accountability. E-government has emerged as a popular catch phrase in public administration to cover all of those functions [1]. E-government has the potential to justify service delivery failures in traditional governments. In the long term, E-government has the potential to positively change the way government operates, and citizens and businesses interact with government. Ndou has reviewed development of e-government in developing countries [2] and specified major challenges including: ICT infrastructure such as telecommunication equipments; policy issues such as legislation; human capital development such as skills and capabilities; change management such as culture, resistance to change;

partnership and collaboration such as public/private partnership; leadership role such as motivate, involve; and strategy.

Misra has overviewed the e-government scenarios for year 2006 and has recognized ten emerging e-government challenges for policy makers in strategy formulation and implementation [2].

In order to implement e-government successfully, appropriate strategies and action plans are needed. In this paper, foresight is used as an appropriate tool for determining e-government strategies and policies.

In the next section, foresight frameworks and experiences of other countries in e-government foresight are reviewed. Then, following the research methodology, the main components of e-government foresight are introduced. Finally, an e-government foresight framework, based on Zachman architecture is proposed.

II. FORESIGHT FRAMEWORKS

According to Martin, "Foresight is the process involved in systematically attempting to look into the longer term future of science, technology, the economy, and society with the aim of identifying areas of strategic research and the emerging new technologies likely to yield the greatest economic and social benefits"[3].

Martin[3], Popper[4], Saritas[5], E.C.[6], UNIDO[7], Miles & Keenan[8], Janssen[9] have presented different frameworks for foresight. Most of these frameworks have three main phases including pre-foresight, foresight and post-foresight. Tegart and Johanson have proposed seven criterion for selecting a foresight methodology including: the degree of future uncertainty, time horizon, future's type, number and type of participators, logistics and key challenges[10]. Martin has proposed foresight typology based on organization specification, covering level, functions, orientation, natural pressures, time horizon and methodology approach[4].

Saristas argues that a systematic foresight should create relations between context, content, and foresight process. Foresight is based on a context that effect on content and process. Context is collection of truths that has surrounded an event, content is collection of something that can be observed, discovered and learned and finally, process is a method of accessing to result and contains the procedures design, perform, implement, evaluate and improvement [5].

III. E-GOVERNMENT FORESIGHT EXPERIENCES

E-government needs long-term futur to consider the e-government vision based on the technological promotion [11][12]. New technologies will affect interactions, specifications, new services, and improvement of the traditional services in future[13]. Therefore, it is necessary to provide some scenarios for e-government services. It is also necessity to recognize uncertain trends besides other trends[9]. This leads to a secure e-government[14] through making desired scenario for the future. The results of e-government foresight have significant effects on policy implementation and revision.

It is crucial to focus on a holistic framework to ensure that all relevant aspects of e-government scenarios, are considered. Such guiding framework should contain the following four aspects as: (a) Society, environment and culture; (b) Governments and administration; (c) Economies, efficiency and effectiveness; (d) ICT development and innovation[9].Scenario makers should balance all aspects.

E-government foresight is implemented in different countries such as Bulgaria[14], India[15], OECD countries[13]. Malaysia in his 2020 programs on e-government[16] have futuristic approach, however, no foresight techniques is employed. Janssen and his colleagues accomplished a common work between Albany, Lithuania, Netherlands and Germany[9] and introduced 15 scenarios for e-government in year 2020 to shape different dimensions of alternative futures.

It is evident that these countries have followed different scenarios to foresee e-government in their countries, but there wasn't a systematic approach in their methods. In following sections, it is tried to demonstrate a systematic approach to conduct e-government foresight in developing countries.

IV. METHODOLOGY

The methodology of this research was qualitative meta-analysis and synthesis[17][18][19]. Meta-synthesis means 'the bringing together and breaking down of findings, examining them, discovering the essential features, and in some way, combining phenomenon into a transformed whole'[20]. The analytic process followed Noblit and Hare's guidelines for conducting a meta- ethnographic synthesis[21]. The analytic steps of this research to derive main components of foresight are(Adapted and simplified from McCormic[22]):

1-Collecting and Reading the studies: checking for relevant metaphors, ideas, concepts and interpretations.

Identifying the relationship between studies, using lists of key metaphors, ideas and concepts.

2- Interpretation and translation : assessing whether some concepts, metaphors and interpretations are able to encompass those of other accounts.

3-Writing the synthesis.

Then a questionnaire was provided to collect opinion of foresight field Experts about selected components. Questionnaire sent to about 40 experts and 35 of them replied questionnaire.

In order to analysis: in order to analyze questionnaire, Entropy Shannon method is used and selected components are validated. Finally, a systematic approach is proposed for foresight studies using Zachman architecture[23].

V.DIMENSION & COMPONENTS OF E-GOVERNMENT FORESIGHT

In this section several studies was investigated to find main foresight factors as noted in the research methodology. In order to foresee e-government, several factors should be considered. After reviewing of related concepts and studies, many components and factors that were addressed were similar. For example UNIDO[7] introduces 12 dimensions and European commission (EC)[6] introduces 15 dimensions that are mainly similar, although, topic are different namely.

TABLE I. MAIN ELEMENT IN FORESIGHT AND THEIR DEFINITIOND.

1- Rationales: Arguments for conducting foresight should be determined. Rationales will tend to emphasize how things can be done better with the help of foresight.
2- Objectives : Declare the achievements of foresight. Objectives may shift over time and it is not unusual for different actors to hold different objectives for a foresight exercise.
3- Review existing strategic arrangements: Addresses how will foresight complement or challenge.
4- Orientation: This element determines foresight focus. Foresight can have any number of orientations, such as science and technology, business dynamics, territorial visions, and societal problems.
5- Level: Can be international, national, regional, or institutional.
6- Coverage: Detects the sectors / issues / problems that the foresight seeks to cover.
7- Participation: Highlights the breadth of actor engagement.
8- Consultation: Identifies the depth of actor engagement.
9- Vision: Visual perception or eyesight.
10- Methods: Are about the methods and techniques used at the various stages of an exercise.
11- Organization and management: Concentrate on the organization and management of foresight.
12- Dissemination: Is about the results of foresight to be diffused beyond those immediate actors who took part in the exercise.
13- Implementation: Results of foresight in following-up the action.
14- Evaluation: Is about assessing the outcomes of foresight.
15- Approach: Approach can be normative or exploratory. In normative approach, desired and possible future are identified to plan for current situation. In exploratory approach, exploratory forecasting starts from today identification and oriented toward specific future.
16- Target audience: Shows all stakeholders that should be involved.
17- Methodology: It is an important activity in foresight.
18- Output: There is different kind of output that depends on methods of foresight.
19- Resources: Includes financial, information, knowledge, human resource and so on.
20- Time horizon: Focus on how far out is foresight to peer.
21- priority: preference, most important considerations.

As UNIDO argues that both technology foresight and general foresight are the same, therefore, foresight components can be used in e-government foresight.

E-government have high priority for development in developing countries. Government is expected to be the largest consumer of ICT products and services in the near future. It has the potential to reduce transaction costs of doing business, increase quality of service, and decrease the corruption. In these countries e-government will increase digital content, effectively integrate and improve their bureaucracy and process productivity, and even leads to social reformations. Developing countries have some constraints such as limited financial resources, inappropriate political climate, lack of institutional framework, insufficient records and databases, insufficient knowledge base and knowledge network and poor infrastructure. Providing a unique vision and fair objectives, focusing on process-oriented decision making, designing a good plan can help to succeed. These parameters already are described as foresight dimension. E-government foresight might have a multiplication effect for conducting of spin-off foresights (tax reforms, IT sector, education, etc.).

TABLE II. CRITICAL DIMENSIONS AND COMPONENT OF E-GOVERNMENT FORESIGHT

Main elements in foresight	Janssen[12]	Popper[4]	UNIDO[9]	Upgrade	Keenan[10]	Martin[5]	Saritas	Havas	Ec[8]
1		✓			✓				✓
2	✓	✓			✓	✓	✓	✓	✓
3	✓				✓				✓
4	✓	✓		✓	✓	✓	✓	✓	✓
5	✓	✓	✓	✓	✓	✓		✓	✓
6	✓	✓	✓		✓	✓	✓	✓	✓
7	✓	✓	✓	✓	✓	✓	✓	✓	✓
8	✓	✓	✓	✓	✓	✓		✓	✓
9	✓			✓	✓				
10		✓	✓	✓	✓	✓	✓		✓
11	✓	✓	✓	✓	✓		✓	✓	✓
12	✓	✓	✓	✓	✓	✓	✓	✓	✓
13	✓	✓			✓	✓			✓
14	✓		✓	✓	✓	✓	✓		✓
15		✓			✓	✓			✓
16				✓	✓				
17		✓		✓			✓		
18		✓						✓	✓
19	✓	✓	✓	✓	✓	✓	✓		✓
20	✓	✓	✓		✓	✓	✓	✓	✓
21						✓			

Table I presents the important components in foresight. Table II compares the application of these components in nine selected frameworks as a conceptual framework of foresight. Between foresight studies in Table II, eight studies are related to general foresight and only Janssen[9] is derived from e-government foresight.

TABLE III. THE RANK OF EACH FORESIGHT COMPONENT USING ENTROPY SHANNON

Foresight components	E	W
Rationales	0.99	0.05
Objectives	1	0.05
Review of existing strategic arrangement	0.98	0.05
Orientation	0.99	0.05
Level	0.99	0.05
Coverage	0.99	0.05
Participation	0.98	0.05
Consultant	0.99	0.05
Vision	0.99	0.05
Methods	0.99	0.05
Organization & management	0.99	0.05
Dissemination	0.98	0.05
Implementation	0.98	0.05
Evaluation	0.98	0.05
Approach	0.98	0.04
Target audience	0.97	0.05
Methods	0.99	0.05
Output	0.99	0.05
Resource	0.99	0.05
Time horizon	0.99	0.05
Priority	0.99	0.05

VI. VALIDATION OF SELECTED FORESIGHT COMPONENTS

For validation of the selected components a questionnaire was distributed and collected and analyzed using Shannon Entropy. The concept of Shannon's entropy is the central role of information theory sometimes referred as measure of uncertainty. According to the Table III, the processing of this algorithm is as follows[24]:

- 1- According to data for each variable, decision matrix is formed

$$DM = [F_{ij}]_{m \times n}$$

- 2- The above frequency matrix is normalized with equation (1).

$$P_{ij} = \frac{F_{ij}}{\sum_{i=1}^m F_{ij}} \quad (i = 1, 2, \dots, m) \quad (1)$$

$$(j = 1, 2, \dots, n)$$

- 3- Uncertainty of each component (E_i) is calculated by using equation 2.

$$E_j = -K \sum_{i=1}^m [P_{ij} \cdot L_n(P_{ij})] \quad (j = 1, 2, \dots, n) \quad (2)$$

Where: $K = \frac{1}{L_n(m)}$

- 4- The significant coefficient of each component is obtained by using equation 3.

$$w_j = \frac{E_j}{\sum_{j=1}^n E_j} \quad (j = 1, 2, \dots, n) \quad (3)$$

Table III shows the rank of each foresight components. As shown, all foresight components are important from expert's view and rank of all components are one expect the "approach" component and should be considered in proposed framework.

TABLE IV. APPLYING FORESIGHT COMPONENTS IN EACH STAGES.

components	preforesight	foresight	postforesight
Rationales	✓		
Objectives	✓	✓	
Review of		✓	
Orientation	✓		
Level	✓		
Coverage	✓		
Participation	✓	✓	✓
Consultant		✓	✓
Vision	✓	✓	
Methods		✓	
Organization ...	✓	✓	✓
Dissemination		✓	✓
Implementation		✓	✓
Evaluation		✓	✓
Approach	✓		
Target audience	✓	✓	✓
Methods		✓	
Output		✓	✓
Resource	✓	✓	✓
Time horizon	✓		
Priority		✓	✓

For identification of applying the foresight components to each stage of foresight, a delphi group with 10 foresight expert with more than 5 year background in foresight study was arranged. They ranked each of 21 elements of Table I for applying in pre-foresight , foresight and post-foresight stages separately. Kendall's coefficient of concordance (W), was applied for measuring of the agreement among experts. When all experts are in total agreement; Kendall's coefficient is $0 \leq W \leq 1$. There is a good agreement between experts If $0.5 \leq W \leq 0.7$ [25]. On the other hand, delphi method can be stopped when difference of W in 2 round of delphi was smaller than 0.05. The results was converged in 2 round of delphi. Kendall's coefficients in first round were 0.610, 0.675, 0.632 and the growths of these coefficients in the next rounds were less than 0.05. The result of delphi is shown in Table IV.

VII. A PROPOSED SYSTEMATIC FRAMEWORK FOR E-GOVERNMENT FORESIGHT IN DEVELOPING COUNTRIES

This section consists of two part: framework presentation and implementation methods.

Part I: Framework presentation

Considering components of Table I and related questions for any e-government foresight elements ,recently a framework as shows in figure 1 is proposed for e-government foresight in developing countries [25][26]using Zachman architecture[27][27]. This framework includes contextual and interaction areas. The contextual area contains subjective forces such as social trends and basic values; developmental issues such as the speed of technological development, changing political climate, and economic development; and constitutional values like privacy and human rights. These factors have some bearing on the e-government developments in the long term. In the interaction area there are some actors such as citizens, business, governmental agencies, NGOs, suppliers, customers, politicians, and legislators. Furthermore, we should consider various models of participation and technology use to involve people in policy-making processes as a part of this area. An independent organization is recommended to take care of the foresight projects[25][26]. The framework is implemented in 3 stage and 5 steps. Each stage should answer to 6 systematic questions (what, how, where, who, when, why) based on delphi results.

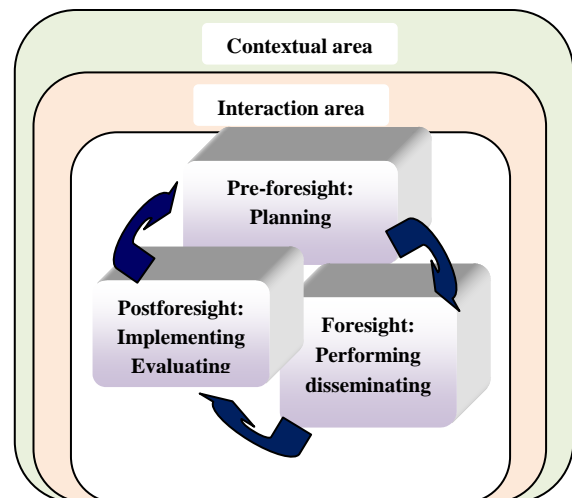


Figure 1. E-government Foresight Framework in developing countries.

A. pre foresight Step1-planning

- What are the rationales, approaches, orientation, focus, resources, vision and scope of e-government foresight? What is the time horizon and determinants of time horizon in your foresight exercise?
- How do manage and organize e-government foresight? How will your focus and objectives affect the rest of the foresight process? How are the focus and objectives of foresight set, and who is involved?
- Where is the location area(level) of e-government foresight and location of the involved organization?
- Who are the stakeholders of e-government foresight?

- When is the e-government foresight due? When are the focus and objectives of foresight set, and who is involved?
- Why the e-government foresight study must be done?

B. foresight

Step2- carry out foresight study

- What information in specific fields (economic, social, research opportunity) is needed? and what is new objectives and existing strategies? What resources is needed?
- How do apply methodology and methods in e-government foresight?
- Where are external and internal network of experts and teams?
- Who are involve in e-government foresight project and what is their skills and structure?
- When is the schedule time of e-government foresight is implementation?
- Why priority and appropriate strategies for future of e-government must be identified?

Step3-Dissemination and result evaluation

- What is output of e-government foresight? And What resources is needed?
- How can secure commitment from the sponsors / stakeholders?
- Where should be disseminated result of e-government foresight?
- Who are responsible of evaluation and dissemination of result?
- When result of e-government foresight should be renewed, evaluated and disseminated?
- Why the implementation of e-government foresight study is prosperous or breakage?
- Why must it improved?

C. post foresight

Step 4- implementation of foresight result

- What information and resources is needed about plans and program implementation?
- How is process of priority and implementation of plans and programs?
- Where(organization and sectors) should be implanted the result of e-government foresight?
- Who are involved in implementation process?
- When plans and programs should be done?
- Why are you undertaking your e-government foresight ?

Step5- dissemination and evaluation of implementation result

- What is the output of plans and program? What resources is needed?
- How is the process of dissemination and evaluation of outputs?
- Where are audience of plans and program results?
- Who are responsible of dissemination and evaluation?
- When result of action plans should be renewed, evaluated and disseminated?
- Why the result of action plans must be analyzed and improved?

Part2: Implementation(activities and methods).

In this section, fore each stages of the framework, important activities and appropriate methods shown in Table V. E-government foresight creates a strong network of experts, decision makers, citizens, industry managers and workers, government employee and SME's managers for creating consensus for developing countries. A consensus conference allows the public rather than experts and politicians to set the agenda for the topic under discussion in foresight project. A citizen panel is trained to formulate a set of questions for experts to answer at a public conference. The citizens panel writes a final document with conclusions and recommendations for policy makers and the public in general.

TABLE V. ACTIVITIES & METHODS FOR E-GOVERNMENT FORESIGHT

	Activities	Methods
Pre foresight	Being clear on reasons for using foresight. Setting the focus ,objectives, coverage, time horizon, scope, orientation and other topics. Obtaining the government supports. Determining project management organization and the steering committee, stack holders, users & policy makers. Determining the resources including of research opportunities, past exercise, scientific and technological resources and finance. Deciding to lunch program.	desk research, literature review, business survey, back casting, brain storming, executive team, Steering committee, horizon scanning
Foresight	Assessing pervious and existing works. Relating the foresight to existing policies and programs. Determining the potential users of foresight outputs and who will benefit from the outcomes of the exercise. Identifying and engaging users in foresight. Identifying and engaging experts and decision makers in foresight and their training. Setting-up a Foresight Exercise. Defining the opportunities and future trends. Generating ideas and opinions. Creating, analyzing and interpret ting scenarios. Composing strategic vision. Providing Recommendations. Identifying the research and industry priorities. Determining the diffusion of foresight results.	STEEP, mind mapping, expert workshop and panel, citizen hearing, consensus conference, scenario building, SWOT, Delphi, Brainstorming, future vision, roadmapping, trend analysis, patent analysis, exploratory expert interviews
Post foresight	Determine resource allocation priorities. Translating results and Deciding to lunch programs and action plans. Determining the sorts of resources that need in order to implement foresight. Identifying location of obtaining resources. Determining the sorts of qualifications should have in foresight implementation. Project definitions and executing the program. Finalizing the reports and Disseminating the results.	revising, relevance trees, key strategies, morphological analysis, brain storming, steering committee, conference, communication strategies, MCDM

VIII. CONCLUSION

E-government is an enabler for better government, an intrinsic political objective encompassing a series of democratic, economic, social, environmental and governance related objectives that has formed new challenges for developing countries. The success of e-government initiatives depends, to a large extent, on the compatibility between the stated goals (economic, political, etc.) and the context within which the initiative is undertaken. Thus, contextual factors, such as the governmental systems, cultures, economic conditions, technological infrastructures, and sociopolitical factors collectively influence a government's capacity to deliver or achieve the goals of an e-government initiative. It demands large investments that can be efficiently managed by scientific approaches through understanding trends, recognizing different domains and applying foresight techniques. The main aims of this paper was presenting a framework for e-government foresight in developing countries based on systematic approach. For this purpose, we investigate the existing frameworks and define all important component in each stage and define the questions related to any elements by the result of two round Delphi method for selection the related component to each stage. The framework proposes a comprehensive framework and employs elements of other framework based on an initiative design that explains 3 steps of foresight project.

The research findings suggest some main implications for developing countries. Systematic approach caused to create a dedicated foresight framework for each country and can initiates best practice of other countries. This framework have a notable consideration the stakeholders in 3 stage of foresight study as shown in Table IV by two approach 1)participation, 2)target audience. This clarifies that not only it is necessary to consider the stockholders approach for increasing internal communication knowledge sharing in implementing the foresigh projects, but also it is necessary to consider benefit of project for them as target audience. This approach enhances their loyalty. Although this framework excites the researchers to classify e-government stakeholders. This framework clarifies all requirements with 30 independent questions. So this provide valuable insights and decision opportunities for virtually all major decision making in management of project. Developing countries successful in deploying e-government foresight with considering future technologies can close technology gap with developed countries.

Future promising technologies may lead to a significant change in the existing establishment, open the gate for new players, lead to new institutional arrangements, change the value chain and relationship between actors and bring in new solutions to the complex problems that current governments are facing. Developing countries have come up with seven so-called 'hot spots' of governmental transformation. Transparency provoking change, changing the accountability paradigm, New forms of policing and law enforcement, changing the privacy paradigm, new countervailing powers,

networked government, and intelligent government. This framework helps them to plan scenarios for future of e-Government. The scenarios can be used as an input for debating the differing possible policy directions for future.

REFERENCES

- [1] M. Yildiz, "E-government research: reviewing the literature, limitations, and ways forward", *Government Information Quarterly*, Vol. 24, 2007, pp. 646–665.
- [2] V. Ndou, "E-Government for developing countries: opportunities and challenges", *EJISDC*, Vol. 18, No.1, 2004, pp.1-24.
- [3] B.R. Martin, "Foresight in Science and Technology", *Technology Foresight & Strategic Management*, Vol. 7, No.2, 1995, pp. 139-168.
- [4] R. Popper, *The Foresight process (Main Phases & Common Steps)*, PREST – Institute of Innovation Research, The University of Manchester, 2007.
- [5] C. Cagnin and F. Scapolo, *Technical Report on a foresight Training Course*, European Communities, 2007.
- [6] Community Research of European Commission, *UPGRADE, Foresight Strategy and Actions to Aassist Regions of Traditional Industry Towards a More Knowledge Based Community*, Dissemination Conference Brussels, 2004.
- [7] UNIDO, *UNIDO Technology Foresight Manual: Organization and Methods*, Vienna, Vol.1, 2005.
- [8] I. Miles. And M. Keenan, "Basic Approaches for Technology Foresight at the National and Sub-National Level", *International Conference on Technology Foresight for Ukraine*, 2002.
- [9] M. Janssen, et al., "Scenario building for e-government in 2020: Consolidating the results from regional workshops", *Proceedings of the 40th Hawaii International Conference on System Sciences*, 2007.
- [10] G. Tegart and R. Johnston, *Some Advances in the Practice of Foresight, EU-US Seminar: New Technology Foresight, Forecasting & Assessment Methods*, Seville, May 2004.
- [11] S. French, "The challenges of extending the MCDA paradigm to E-democracy", *Journal of Multi-Criteria Decision Analysis*, Vol. 12, 2003, pp. 63-64.
- [12] J.C. Eurgelman, et al., "E-government in Europe in 2010: Key Policy and Research Challenges," *IPTS Workshop*, Sevilla, 4-5th March. 2004, European Commission Joint Research Center, <http://fiste.jrc.es>
- [13] L. Giorgi and A. Hauptman, *Review of Foresight Studies and Emerging Technologies on E-government, E-government for Low Socio-Economic Status Groups*, 2007, OECD Website, Egove.Foresight.PDF.
- [14] R. Sofia, *E-government Foresight in Bulgaria, Applied Research and Communications Fund and Coordination Center on Information, Communication and Management Technology Department.*, Bulgaria, 2007.
- [15] V. Kanungo, *E-government Foresight for the Next Decade:Key Policy, Implementation and Research Challenges for India*, CSDMS, 2006, see at: www.Eissa.Org/pdf/new%20folder/key%20policy%20for%20egov_vikas%20kanungo.Pdf
- [16] S. Salleh, *The Multimedia Supper Corridor (MSC) & E-government Initiatives in Malaysia*, 2006. http://purple.Giti.Waseda.Ac.Jp/bulletin/2003/2003papers/2003general_03_sohaimi.pdf
- [17] R. Campbell, et. al., "Evaluating meta-ethnography: a synthesis of qualitative research on lay experiences of

diabetes and diabetes care,” *Social Science and Medicine*, Vol. 56, No. 4, 2003, pp. 671-684.

- [18] C. Beck, “Mothering Multiples: A Meta Synthesis of the Qualitative Research”, *MCN, The American Journal of Maternal /Child Nursing*, Vol. 28, No.2, 2002, pp.93-99.
- [19] D. Finfgeld, “Metasynthesis: The state of the art-So far”, *Qualitative Health Research*, Vol. 13, 2003, pp. 893–904.
- [20] R. Schreiber, D. Crooks and P. N. Stern, *Qualitative meta-analysis. In J.M. Morse(ed.) Completing a qualitative project: details and dialogue*. Thousand Oaks, CA: Sage, 1997, pp311-326.
- [21] G.W. Noblit, & R. Hare, *Meta Ethnography: Synthesizing Qualitative Studies*, Sage, Newbury Park,CA,1988, pp. 32.
- [22] J. McCormick, P. Rodney and C. Varcoe, “Reinterpretation across studies: an approach to meta-analysis,” *Qualitative Health Research*, Vol. 13, No. 7, 2003, pp.933-944.
- [23] J.A. Zachman, *Excerpted from The Zachman Framework: A Primer for Enterprise Engineering and Manufacturing* (electronic book), 2003. See at: <http://www.zachmaninternational.com>.
- [24] A. Jessop, “Entropy in Multi attribute Problems”, *Journal of Multi criteria Decision Analysis*, 1999.
- [25] S. Siegle and N. J. Castellan, *Nonparametric Statistics for the Behavioral Sciences* (2nd ed.), New York: McGraw-Hill, 1988.
- [26] F. Saghafi, B. Zarei and A. Aliahmadi, “E-government foresight in developing countries”, *World Applied Science Journal*, Vol. 3 , 2008, in press.
- [27] F. Saghafi, K. Abbasi and B. Zarei, “A Proposal Framework for E-government Foresight Based on Zachman Architecture Model in Developing Countries”, *International Conference on Convergence and hybrid Information Technology (ICCIT08)*, Busan, Korea, 11-13 Nov. 2008.

Fatemeh Saghafi : She is one of the faculty member of Iran telecommunication Research Center (ITRC). She

holds a BSc in Communication engineering and MSc in Industrial engineering. Now she is a PhD student in industrial engineering. She has been working for about 12 years in ITRC. Her main research interests include e-government development and implementation, system simulation, foresight, performance management systems and decision-making science.

Kolsoom Abbasi shahkooch : She received her MSc in Information Technology from university of west England Bristol in UK. She has been working in Iran telecommunication Research Center (ITRC) as a researcher for about 5 years. Her main research interests include e- government development and implementation, foresight, Information Technology, E-commerce and decision-making science.

Behrouz Zarei: He is an assistant professor of management science at the Entrepreneurship faculty of Tehran University. He holds a Ph.D. in management science from the Management School of Lancaster University. He has served as the systems and software manager for the project of development of Iranian Government’s Electronic Administration System. His main research interests include e- government development and implementation, system simulation, business process reengineering (BPR), and decision-making science.