University College of Takestan

Available online at **http://UCTjournals.com**

UCT Journal of Research in Science ,Engineering and Technology

UCT . J. Resea. Scien. Engineer.Techno.(UJRSET)

2(1): 32-43 (2014)

Volume 2,Issue 1

ISSN:2382-977X

The Impact of Social Capital on Enterprise Architecture of Government-to-Government in Iran: A Scenario Planning Approach

Yaser Ghelishli[1], Seied Sepehr Ghazinoory[2], Seied Ziaodin Ghazizadeh Fard[3]

[1,2] Management and Economy Department, Tarbiat Modares University, Jalal Ale Ahmad Highway, P.O. Box: 14115-111, Tehran, Iran

[3] Industrial Engineering Department, Emam Hossein University, Babaei Highway, P.O. Box: 16765-996, Tehran, Iran

*Corresponding author's E-mail:yaser.ghelishli@gmail.com

ABSTRACT

We combined three areas of social capital, G2G and the enterprise architecture (EA) which are some of the important areas. Due to the complexity of governments' responsibilities, using G2G EA is essential. Three EA styles and five elements of G2G are elected and a combination method of scenario planning and interviews is chosen as the research method. Four steps are determined for the scenario planning(SP) process. And, in one of the steps in SP, we create 9 scenarios with three elements of social capital (Trust, Partnership and Norm). Then, by using interviews, we propose eight different combinations of the three styles of EA and five elements of G2G.

Original Article:

Received 24 Jan. 2014
Accepted 17 Mar. 2014
Published 30 Mar. 2014

Keywords:
Social Capital; Enterprise Architecture; EA Style; Government to Government (G2G); Scenario Planning

1.Introduction

Today, one of the requirements of Iran is changing to E-government and having electronic exchange of information between public organizations. Most important challenge of the public sector is to respond to the demands and changeable expectations of citizens from which the public sector achieve its legitimacy [12]. Government to Government (G2G) is the first step in providing basic services to the people and create efficient and effective e-government [42].

On the other hand, social capital is one of the most important and influential factors in any project in the field of public issues and, this important issue in various projects of the public domain is not negligible. If citizens do not have confidence in the systems, e-government, and consequently G2G or the system will not be in agreement with their general norms and they will not participate in the success and use of the system. Therefore social capital is the most important issue that should be under careful consideration in the structure of G2G. In a conceptual sense, G2G is defined as using electronic devices to provide services among government organizations in addition to re-engineering processes in the organization. Require re-engineering processes in a very large and complex structure shows the close relationship of EA and the G2G. In the role of public organizations usually the high scale and complexity of them are usually evident overall, which show the necessity of G2G enterprise architecture. G2G EA design must also consider the social capital. Thus, the focus is on studying the effect of social capital factors on EA of G2G. In this study, our main goal is to study the effects of social capital in a G2G EA design according to operating conditions and level of social capital.

2. Research background

This research consists of three major business areas, including EA, G2G and social capital. The literature review of these concepts is beyond the topics of this research, therefore we first provide some definitions of each major area and then we review earlier studies on relationships between these three areas.

2.1 Enterprise architecture

Some organizations like Institute of Electrical and Electronics Engineers (IEEE), Application Guide U.S. Federal EA and Federal Enterprise Architecture Program Management Office present different definitions of EA [24]. In general, we can say that these groups define the EA in vision of the organization and the organizational understanding.

In another approach, Ambler in defining EA has focused on structures, processes and activities of the organization towards the time [1]. In fact, he has taken a Down-Top movement based on the process. Shan has chosen a combination of organization and information systems to define EA. So, EA is obtained based on the visions and organizational strategies and, has a close relationship with information technology [37]. MITRE Corporation in EABOK (Guide to the (Evolving) Enterprise Architecture Body of Knowledge), in section "Engineering the EA" has done a certain classification of EA, including three styles of component-based architectures, service -oriented architectures and federated architectures [21]. According to general definitions and style which some researchers have worked on, the EA can be classified into three categories:

- Government-oriented EA: When the organization is faced with complexity, two major strategies can be used by system architects: First, integration and central management and control in organizations in various fields and second, the division of organization into sub-

organizations with their own management but the coordination between these sub-organizations is done federative.

- Process-oriented EA: In this style, professional goals are mapped with the Top-Down approach to operations and activities until when all business processes can be organized.
- IT-oriented EA: In this case, the goal of EA is to make information technology aligned with business to improve efficiency and productivity. This approach will focus on the bottom layers and the effective integration of information systems and technology infrastructure is targeted.

2.2 Government to Government (G2G)

E-Government is a way of governments to use new technologies, providing affordable access for people to information and public services, improving the quality of the service and providing the possibility of participating people in democratic activities [12]. With respect to different definitions, four models of communication are important in an e-government system, including Government-to-Citizen or Government-to-Consumer (G2C), Government-to-Business (G2B), Government-to-Employees (G2E) and Government-to-Government (G2G) [13]. The overall aim of G2G is to provide online collaboration and communication of public sector or agencies in a government infrastructure database to create effective performance [38].

Various factors are affecting on the success and failures of G2G projects. Each of these factors is also effective on the selection and design of G2G EA. In addition, G2G is associated with the citizens and social capital elements are involved in this communication. Three factors of education, culture and security have been introduced as three important factors affecting the success of G2G projects [27].

In a study that was conducted in China, Location factor is effective in e-government [10]. Therefore, as G2G is a relationship between various governmental departments in e-government, the location should be noted. On the other hand, although Iran is not the federal country but, it has diverse cultures and its ministries have different forms of power. Therefore, it is better and preferable to use this factor of G2G projects in Iran.

2.3 Social Capital

History of social capital can be found in many papers which is outside scope of this research [18]. So, what important in this article is to choose a clear definition of social capital and its elements. Many researchers provide different definitions of social capital like the World Bank, Portes, Cohen and Prosak [34]. Nahapeite and Ghoshal defined social capital as the sum of actual and potential resources which are available within the structure through the network and relationships of an individual or a social unit and Bourdieu also defined social capital similar to the Ghoshal's approach [30]. Meanwhile, Fukuyama claimed that many of the definitions refer to secondary phenomena which are known as results of social capital not as elements of social capital. He defines social capital as a set of social norms existing in the social systems to promote cooperation of community members and descended exchange and communication cost [15].

In this paper, we used the definition provided by Putnam, because it is the comprehensive definition and had been used in many different studies in Iran. Robert Putnam defines social capital as Trust, Norm and Networks, which will facilitate cooperation of the parties to achieve mutual benefits [41]. He believes that, whatever these networks being aggregate in a society, the possibility of cooperation of citizens to further mutual benefits will increase [36]. Study on the elements of social capital, can point three elements of Trust, Partnership and Norm.

"Trust" is a key element of social capital. The expectations that increase regular and legal communities, honesty and cooperative behavior in the normal behavior of community members are called Trust [8]. In Putnam viewpoint, Trust is a valuable element in social capital, that if the government has a high level of trust, it achieves the same amount of political growth and social development [36].

Another element of social capital is the "Partnership" which is a process that involves various individual and team actions to participate in determining their own and their society's goals. Also, it is a process to influence on decisions about public issues [40]. "Norm" as the third element of social capital is called to be a behavior pattern which will regulate social relations and interactions. Norm is achieved through consensus which is not necessarily a direct result of meetings and a conscious decision [5].

2.4 The relation of EA and G2G

In many organizations and countries of the world various frameworks have been considered for exchanges and activities between the organizations. Among them, can mention to International Organization for Standardization in 1984 and the National Institute of Standards and Technology of USA in 1988, as Government Open Systems Interconnection Profile (GOSIP), which was the basis of TCP/IP and become more complete within several years [20]. Also, other frameworks have been introduced in European countries such as e-government Interoperability framework (e-GIF), e-government unit in the UK (eGU), Danish e-Government Interoperability (DIF) in Denmark and CCI (Le Cadre Commun d'Intéroperabilité) in France. The major difference between them is the necessity in implementing and the pre-defined level of definition [20]. In 2003, Germany on its federal management organization represented a standard of architecture for e-government. That is suitable for the federal states. Also, Europe Union has determined IDABC for information exchange between European Union that the rules and communication are clear in it [2].

Luis Guijarro has investigated the role of EA in these interactions and, has shown the importance and the role of EA in success of the interactions. However, he does not reflect elements of the enterprise architecture, and how to define and determine it [20]. Zarei and Ghapanchi in their article, which was a case study of Iran, began to study the effective mental principles on G2G architecture in Iran [43]. In this article they also mention that the e-government architecture should have high flexibility to match up with the changeable nature of governments. After the study of twenty-nine mental principles, they categorize them in the four groups.

2.5 The relation of EA and social capital

Australian Government Architecture Reference Model is given various commands to explain the architecture of the Australian Government [4]. But, it does not much concentration on social issues, citizens and even cultural factors. In fact, although in some architecture like this article and TEAF has been studied cultural issues, but social capital and its various elements in EA has not been reviewed yet.

It is clear that in none of the architecture and frameworks like Zachman, TEAF and FEA, the United Nations Framework architecture, and C4ISR, social capital and its elements are not considered.

2.6 The relation of G2G and Social Capital

Specifications of information technology with a variety of social transformation are effective on the performance of organizations and government. Three elements of trust of citizens, social networks and community management are important for the effects

of social capital in the electronics issues and especially e-government [3]. With this respect, "e-Government Network Infrastructures" which we have shown it as e-GNI in this article, can be used as the information infrastructure to help to create "Partnership". Therefore, one of the barriers in implementing e-government and consequently G2G are cultural-structural barriers. E-Government can be verified from people's viewpoint who end consumers of government services are. Accuracy, sensitivity, safety and citizen participation as well as user comfort in using services are issues that must be considered. This structural model is shown in Figure 1.

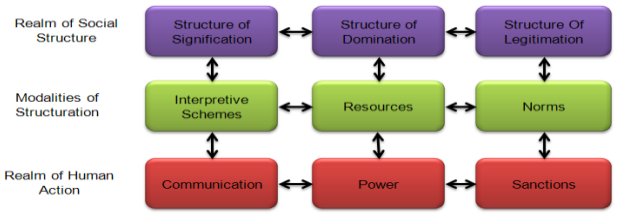

Figure 1: Structural Model (Devadoss, P. R., Pan, S. L., & Huang, J. C., 2002)

To achieve success in implementation and to serve the enterprises and the citizens, having a framework or standard interaction between organizations is not enough, and offering technical manual or in other words, EA is necessary. In Fact, EA is a comprehensive view of all components, elements and communications which makes the growing movement of organizations [20].

We have summarized the subjects of our research in Table 1.

Table 1. Summarized overview of subjects

Subject Area	Author	Article Title	Description	Result
Enterprise Architecture and G2G	Guijarro, L., 2007	Interoperability frameworks and enterprise architectures in e-government initiatives in Europe and the United States	The various architectural framework, the interaction between organizational and EA have reviewed, but has not introduced certain architecture and key elements. Also, there is not any architecture for G2G.	In this area we can just referenced to the studies of Zarei, and Ghapanchi, which have raised an important element.
	Zarei, B., & Ghapanchi, A., 2008	Guidelines for government-to-government initiative architecture in developing countries	Fourth factors is expressed as architectural elements effects on G2G; security, content and applications, management, and infrastructure.	
G2G and Social Capital	Ashena Group, 2005	Electronic Government	Citizens' Trust, social networks, community management, and participation have been considered. But not as elements of social capital.	In mentioned articles, the most emphasis in the field of e-government is on partnership. And also, two elements of trust and norm have been considered as important elements of social capital in e-government but, G2G has not been considered particularly.
	Heeks, R., & Bailur, S., 2007	Structurational analysis of e-government initiatives	Partnership is considered as an important element in e-government but, social capital in e-government has not reviewed.	
	Architecture guidelines for trans-European telematics networks for administrations ., 2004	The impact of government-to-government endeavors on the intellectual capital of public organizations	Intellectual capital and electronic exchange has been considered but, Exchanges in G2G and the specific elements that can be as social capital have not considered.	
Enterprise Architecture and Social Capital	Australian Government Architecture Reference Models ,2007	Architecture Reference	None of the elements of social capital is not specifically addressed in the enterprise architecture	According to studies, social problems and consequently social capital have not attention on enterprise architecture.
	Toh, K.T.K., Nagel, P., 2009	A business and ICT architecture for a logistics city.	Social capital is not considered, and just community in EA has reviewed.	
Enterprise Architecture, G2G and Social Capital	-	-	-	According to the research and studies, there is no paper or article which has reviewed these three elements together.

Considering Table 1, we chose the elements in each of three areas of enterprise architecture, G2G and social capital to be able to examine the interactions of these areas. These elements are brought in Table 2.

Table 2. Key elements of enterprise architecture, social capital and G2G

Area	Enterprise Architecture	G2G	Social Capital
Key Elements	▪ Government-oriented ▪ Process-oriented ▪ IT-oriented	▪ Education and training ▪ Culture ▪ Security ▪ Location ▪ e-GNI	▪ Trust ▪ Partnership ▪ Norm

3. Research Methodology

While the governments are in a state of changing with high rates, G2G is defined in structure and form of government. In other words, governments have high natural variability [43]. This variability makes it difficult to design and make decisions, in relation to G2G enterprise architecture. In addition, issues and key elements of G2G are a set of internal concepts, that their structures are unknown. Strategic activities and related programs are integral parts of governments but they have no routine procedures and always according to the discretion and conditions, have many variations. In other words, uncertainty is the nature of strategic issues [14].

High levels of complexity are inherent in enterprise architecture. In many studies this complexity has been considered and it is indicated that this area is also faced with a lack of simplicity [16 & 20]. Planning tools such as stochastic programming, SP, decision analysis and game theory, are the methods can be used to handle uncertainties and flexibilities.

Chermack and Korte explore SP as a tool to help change organizational culture. They say SP is a tool for passive issues [29]. In an article the application of SP used to explore the e-government futures [9]. Also, according to Heeks and Bailur studies, the majority of e-government studies use interviews and questionnaires besides the Delphi study methods and SP [22]. Also, Heek and Bailur have noticed that in less than a quarter of the articles used a combination of methods, which is usually a combination of interviews with other methods [22].

In this paper we use the SP, for the following reasons:

- High level of uncertainty for the vital and important assumptions, SP is the best method [28].
- The aim of scenario analysis is not obtaining forecasts but to create alternative images of the future development of external environment [32].
- The scenarios are used to assist managers in understanding, attention and response indefinite phenomena [39].

3.1 SCENARIO PLANNING

There is no standard method for SP and different people depending on field deployment scenarios have chosen a specific model. Although in viewpoint of Ghazinoory and Heydari there is no specific SP [17]. In this article we use Wilson and Ralston's SP process [7]. They provided a comprehensive and detailed SP process that involves 18 steps which can be considered as constituted by four different phases:

- Phase 1- Getting started: This phase involves step one to six that must include define problem, decision focus and scope .
- Phase 2- Laying the environmental analysis foundation: Steps seven to ten are concerned in this phase. Most important event that we have to do in this phase is identifying and assessing decision Key-factors.
- Phase 3-Creating the scenarios: Step 11 to 14, constitute this phase. According to this, we need to write scenarios or stories by using previous phase.
- Phase 4- Moving from scenarios to a decision: In this phase we should provide our recommendations for each scenarios

3.1.1 Step one: Getting started

There is an issue of how to design an EA for the G2G systems which is used to meet the needs of G2G projects. To this end, we must first identify the elements that influence our project area and its architecture. The factors of this step can be divided into two categories; uncontrollable factors and controllable factors.

In this research, social issues and specifically social capital are uncontrollable factors that occurring in long-term process in the social structure. Study of this issue is outside the scope of this research and in this paper we consider them as uncontrollable factors.

Also, we accept EA styles, G2G and important elements of G2G, as controllable factors and in this article we try to control them based on uncontrollable factors.

3.1.2 Step two: Laying the environmental analysis foundation

According to literature review, the issues which are brought in table 2 are the key elements. In fact, uncontrollable factors are important elements of social capital, including Trust, Partnership and Norm. Controllable factors in EA categories are three styles of enterprise architecture; Government-oriented, Process-oriented and IT-oriented. Also, G2G elements include Education and training, Culture, Security, Location and e-GNI that are assumed as controllable factors in this article. We consider Education and Training from the technical approach, including software, hardware, and systems training and etc.

Another elements of G2G is Culture and the purpose of that, is making culture and cultural bedding, to recognize and accept the use of information systems particularly G2G systems in an enterprise to promote Trust and Partnership in use of these systems.

The third element is Security. We have considered it from both technical and psychological approaches. This means that people should feel secure mentally and emotionally, in terms of interaction with hardware and software equipment.The purpose of using the element Location is to consider the organizational and spatial differences in designing EA and G2G systems. These differences are often considered in terms of organizational culture.

E-Government Network Infrastructure (e-GNI) is also important as a communication platform. In fact, this is the infrastructure between the two or more organizations to communicate with each other on the public organizations communication platform and the G2G system can be implemented on it.

3.1.3 Step three: Creating the scenarios

We design scenarios based on elements of social capital. We can obtain the mean value of these elements in the two organizations. In the relationship between two enterprises, we take the average of each social capital element's level. Therefore, we can determine the total level of the element and based on these results, we deliver our Proposed Packages. Each element can have three levels; Low, medium and high. Nine different states are created from combining

these three elements levels, and in fact every case is a scenario. We've shown the various modes of social capital elements and various scenarios in Figure 2. We discuss about these Proposed Packages in section 5.

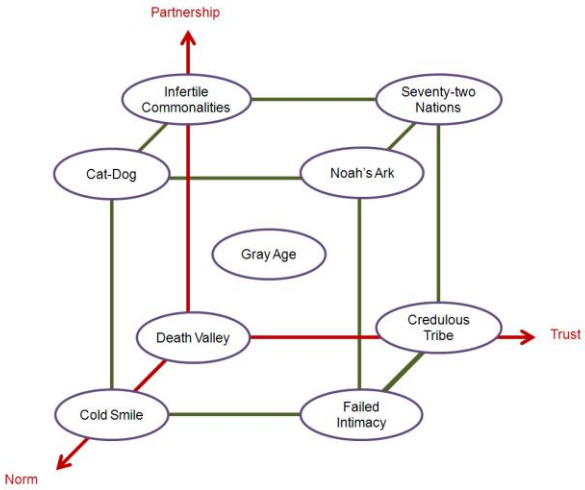

Figure 2: Various modes of social capital elements in the organization

3.1.4 Step four: Moving from scenarios to a decision

In this step with usage of controllable factors which are pointed in the last step we start to do composition and integration in order to represent "Proposed Packages". As we mentioned before, we use the method of interview to prepare the Proposed Packages. This interview process is discussed in section 6. This step of SP is discussing the results of the research, which are the result of the interviews. In section 7 we define the result of this step.

3.2 Designed scenario

According to step 3 of the selected SP, in this section we discuss nine scenario and the specifications of each scenario.

3.2.1 The First Scenario: Death Valley

At this point, all three elements of Trust, Partnership and Norm, are in their lowest level. In this case, organizations are moving toward destruction. Because none of the three basic elements of social capital exists thus the possibility of creating relationships between people and enterprises are reduced. Indeed, in this case, the possible implementation of G2G and probability of its success is extremely low. Therefore, design and implement of G2G, although confused and ineffectual, but it seems such a system can absorb people to Trust and Partnership and thus, the common Norm come into existence and enterprises can be saved from destruction. The name "Death Valley" is taken from God "Bible" which is a symbol of moving towards destruction.

3.2.2 The Second Scenario: Cold Smile

Considering the level of social capital factors in this scenario, the possibility of creating such cases is very low and rarely happens. In this condition, there is only Norm factor and this means that organizations and society are moving toward their destruction. The condition is that the people are together because of common Norms. But Trust and Partnership is not rampant among them. Most likely, these norms can be seen as institutional norms which are weak and they result in destruction because of the absence of Trust. We have chosen the name of "Cold Smile" for this scenario because the superficial high level of norm probably goes away quickly and it is such a smile that is fading rapidly.

3.2.3 The Third Scenario: Infertile Commonalities

At this point, the level of participation in enterprises is high, but the other two factors have a low level and are negligible. In this situation, there is no Trust between staff and their organizations. Also, there is no Norm and behavioral framework to enhance participation and guarantee its survival. In fact, these conditions probably destroy the partnership in an enterprise. There are two types of contributions, including social and civic partnership. In this case, considering lack of Trust and Norms, the enterprise has civic partnership.

In this situation, there are commonalities between individuals and organizations that did not have any benefit and will not cause fertility; that is why we've chosen the name "Infertile Commonalities" for it.

3.1.5 The Fourth Scenario: Credulous Tribe

At this point, although neither Partnership element nor the Norm element exists, a powerful element of trust remains. If such a situation occurs that there is no awareness and knowledge, there is possibility to move towards the best conditions and maturity, because the important principle of Trust yet exists. Meanwhile, the wrong policies may lead the system to the first point (The first scenario). In this scenario because there is a naive trust in employees and this trust is not used in order to move organizations toward excellence, people are like credulous tribe.

3.1.6 The Fifth Scenario: Seventy-two Nations

In this context, Partnership and Trust are two elements which are in a positive and favorable conditions and the Norm is the element that is in the lowest level. In this situation, most likely, the system will move towards perfection and to the eighth point. Indeed, Trust in employees, generates partnership and finally, the strong norms will be formed.

Situation in this Scenario is like the various sects and nations that have come together in cooperation and partnership and without common norms, and also trust each other. Hence, the name of "seventy-two nations" is taken from the Christian faith about seventy-two nations that were created by sons of Noah.

3.1.7 The Sixth Scenario: Cat-Dog

According to the Figure 2, Partnership and Norm in this option have high levels and Trust is at a low level. In this scenario, there is a kind of incommensurability, because the most important element of social capital (Trust) cannot be relied. In fact, norms and partnership have not been formed based on the principle of trust. However, due to the common norms and the participation of the staff members, it is possible that the high level of norm and partnership lead to Trust. The name is derived from the name of animation "Cat-Dog". In which the two animals are connected to each other and are forced to participate with each other and have similar norms without the Trust.

3.1.8 The Seventh Scenario: Failed intimacy

At this stage, Trust and Norms in organizations are high, but the level of participation is low. Organizations have important elements but they do not use them as well. This is because the Partnership does not exist in enterprises and consequently there is no cooperation in them.

Enterprises in this point have strong and good resources but they cannot be used or not used.

In this case, trust and norms has created intimacy between employees but the enterprise cannot be achieved the good result of

it and this intimacy has no consequence. Therefore, the name "failed intimacy" was chosen for this scenario.

3.1.9 The Eighth Scenario: Noah's Ark

In this condition, all three elements of social capital are in their higher level. And in fact, the community level in the organization is high. Therefore, the organizations have highly cultural and social readiness and preparedness. "Noah's Ark" in different cultures and religions is a symbol of perfection and power, and because of this, we select this name for this scenario.

3.1.10 The Ninth Scenario: Grey Age

At this point, from the perspective of social capital, government agencies are neither at peak nor in a state of decline and destruction. From the fuzzy logic approach, this condition is more possible for the enterprises and they often settle in this position.
In this case, employees are in relative trust to the system, organization and other employees. Their common norms cause participation in activities and organizational processes. "Gray Age" is derived from fuzzy logic, which is expressed the issue in the state as of grey, not black nor white.

3.3 Interviews

In this research we've chosen the interviewees based on their eligibility on satisfying the following conditions:
The interviewee has to know about the scopes of the e-government, especially G2G; and also has to have executive experience in this field.
The interviewee has to be fully familiar to EA and its structure and styles.
Social issues should concern person and, concepts related to social capital has to be tangible for him to understand scenarios.
For collecting interviewees, the method of a paper in which interview is the information gathering technique, is used [31]; First, we referred to a person specialist in field of G2G EA (let's call him Mr. X). This person had relationships with appropriate people for interview, so he could give us a list of these people. Then through our interviews with listed people, we requested them to introduce eligible people for our research. After all this survey on eligibility of them, we chose 12 persons for interview, although 4 of them didn't attend the interview. The career background of the interviewees – who we call Mr. A, Mr. B and etc. in this research- is mentioned on Table 3.

Table 3. List of interviewees and dates

Mr. A (Jul. 26, 2010)	The manager of information technology department in a big oil company.
Mr. B (Aug. 4, 2010)	CEO of a corporation for implementing organizational and information architecture projects
Mr. C (Aug. 24, 2010)	CEO of a corporation in designing and implementing information systems
Mr. D (Aug. 30, 2010)	Education consultant of a bank
Mr. E (Aug. 2, 2010)	The manager of the EA department in an IT-oriented company
Mr. F (Sep. 21, 2010)	The assistant of operation department of a banking service providers
Mr. G (Oct. 5, 2010)	The assistant of development department of a banking service providers
Mr. H (Oct. 12, 2010)	Staff of a banking service providers

Before interview, we called each of the mentioned people by telephone and described the general subject of the research, also a summary of the research subjects and the contents of the interview were sent to them via email. In the sent document the research objective, problem definition, definition of social capital factors, G2G factors and the three way of EA were included.
In the interview everyone had the chance of selecting one or more alternative(s) or even using the provided percentage of each chosen alternative. Because the selected people are not chosen upon sampling and have not a distinct statistical population, we cannot determine weight of the interviewee's idea, so each person in each scenario had one point/score for choosing EA factors and one point/score for choosing G2G factors. If there is more than one chosen area, the score of the choice is divided by the number of chosen alternatives. In other words, the score of each alternative is calculated based on the simple formula shown below:
Score = (1/ number of choices)

4.the results

As we mentioned in step 5, in this section we discuss the results of the interviews. The attempt was to use interviews to generate Proposed Packages for each of the scenarios. The first interview results are shown in Table 4.

Table 4. Total score of each Scenario

Scenario	Enterprise architecture styles			G2G elements				
	Government-oriented	IT-oriented	Process-oriented	Education & Training	Culture	Security	Location	e-GNI
Death Valley	2.6	1.4	4	0.7	3.2	1.2	0.45	2.45
Cold Smile	0.5	3.8	1.1	1	1.83	1.5	0.33	2.33
Infertile Commonalities	0.5	3.6	2.3	3.25	1.08	1.91	0.91	0.83
Credulous Tribe	2.8	4.6	0.6	3.05	1.53	0.2	1.03	2.2
Seventy-two Nations	1.1	2.1	4.8	1	2.83	0.33	2.16	1.66
Cat-Dog	1.7	2.1	4.2	1.83	1.33	2	1.16	1.66

Failed Intimacy	4.4	2.4	1.2	1.41	2.41	0.91	0.33	2.91
Noah's Ark	2.26	3.76	1.96	2.7	2.2	1.2	0.7	1.2
Gray Age	1.66	4.16	2.16	2.3	1.46	1.13	1.13	1.96

It is good to mention that Mr. D did not come up with any idea on second scenario and in fact he had not scored the alternatives of the mentioned scenario.
In choosing the style of the enterprise architecture, only one option can be chosen but in choosing the G2G factors multi-selections can be done. Because of this, in choosing the style of the enterprise architecture, like any other selection, each alternative should gain at least half of the total score (4 points) and allocate more score to the alternative, in comparison to other architecture styles, in order to be chosen. In G2G, two of factors have to be chosen which have the most importance. For choosing the factor, the score of 1.6 at minimum is necessary and also its score should be more than other factors.
In the fifth scenario, e-GNI factor has obtained the minimum score, but because it has gained the lower score than culture and location, it's not selected. But, in other scenarios, only two factors have gained the lowest score. In this case, we considered two of factors in each of the scenarios. In choosing the style of organizational architecture, in scenarios 2, 3 and 8 the lowest score which was needed is not obtained, so for these scenarios we should have other interviews. Mr. H, Mr. D and Mr. C are chosen as interviewees in this case. The reason is that Mr. H has made percentages for each of styles in the first interview, and here he was asked for choosing only one item. On the other hand, Mr. D had not answered the second scenario and in 8th scenario had chosen every style. Also, Mr. C had chosen all three alternatives in 8th scenario and answered the third scenario in doubt.
Obviously, in this interview one of the styles of Government-oriented or IT-oriented should be chosen in the 2nd and 8th scenario and one of the styles of IT-oriented or Process-oriented in the 3rd one. After the second interview the last score of the mentioned people was omitted and the new score was calculated. The result is shown in the Table 5.

Table 5. The new scoring system for 3 scenarios

Scenario	Enterprise architecture Styles		
	Government-oriented	**IT-oriented**	**Process-oriented**
Cold Smile	2	6	0
Infertile Commonalities	1	5	2
Noah's Ark	2.5	5	0.5

5. Discussion

All the Proposed Packages are well defined and can be represented in scenario schedule based on the explanations and reasons of interviewees. 8 proposed Packages which can be allocated for 9 scenarios are shown in Figure 3.

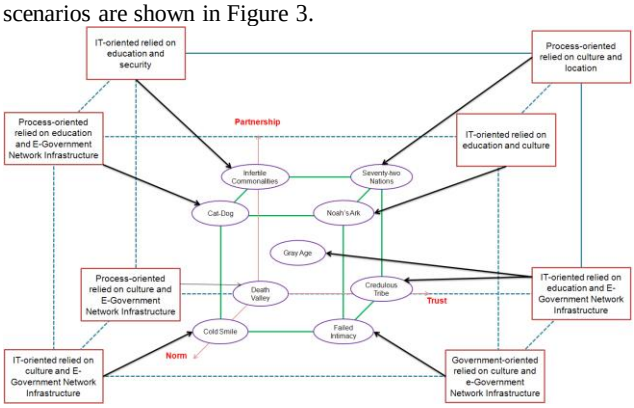

Figure 3. Assigning the proposed package to the scenarios

5.1.1 Process-oriented relied on culture and e-GNI for Death Valley

When Process-oriented relied on Culture and e-GNI for Death Valley, use of the top-down approach style is recommended. In fact, in this package EA design is not direct and cannot be left to the low level. So it should go through organizations and should not be considered as a black box and use of Government-oriented style is not recommended yet. So, it seems that process reengineering and defining new processes is the best way. We cannot use IT-oriented style, because people will not Trust on operational and information systems and will not contribute on using them. As a result the operational design will fail.

The most important thing that approves using Process-oriented style is going through inside of the organization and improves it from inner side. Although, one risk is that it needs the contribution of people in processes and this can fail the system. Because of this risk, concentration on continuous reengineering of the processes is suggested. In fact, this shows that the weakness in the social capital may be the result of process weakness .
In this package the most important factor of G2G is Culture or promotion. This factor is important since it has to be used in long term for Culture of use and Trust on information systems. In fact, Culture should be well considered in enterprise architecture. The second important factor in G2G is e-GNI. This factor makes communications easy and simple and so the contribution will be improved. We can upgrade people communication by communication infrastructure, it can help to make same norms between people.

5.1.2 IT-oriented relied on culture and e-GNI, for Cold Smile

In this package we suggest using IT-oriented EA for cold smile scenario. There is no need of change in processes. So we are following a down to top approach. The view is mostly operational, because in this style the attempt is to design IT infrastructure, so the problems of operation which affect the enterprise is considered. Because there are some norms in organization, it's understood that the lack of information technology is resulted due to lack of contribution and trust. By preparing productive, efficient and suitable systems we can attend the people's Trust. People have same Norm that stand in front of the process implementation. By the way, if it is needed, we can add some processes in information technology system, so Process-oriented style is not applicable and because same norms exist, we can handle needs based on norms, so there is no need of using Government-oriented style.
In this package also, the first priority is "e-Government Network Infrastructure" as an infrastructure. In fact, by easing

communication people should be enthusiastic to contribute with each other. In addition, because the IT-oriented is recommended in this package, infrastructure should be worked on and also low collaboration will make e-GNI be more important than other infrastructures. The second factor in this package is "Culture". In situation that organizations have norms, the conception of making culture is so important, changing and improvement of the people's view can be done by means of making culture. Due to difference in Culture and Norm, the risk of people's rigidity exists. So, one should pay attention for this difference while designing an IT-oriented architecture. Using this difference should be extended psychologically and this needs suitable culture. In addition, in this way we should attend the mind trust of people, because based on the social capital level, it seems that most of the problems are psychological. In fact, based on the existing norm and by means of IT-oriented style and communication infrastructure (e-GNI), we try to delete instrumental barriers and in other view, put force on people. This force is not because of rules so reduction of probability of the rigidity against it can lead to partnership.

5.1.3 IT-oriented relied on education and security for Infertile Commonalities

In this package, we also recommend IT-oriented architecture. This style tries to make operations easy to make necessary communications. In this scenario contribution and collaboration in organization are existent and so the operational procedures can be done in progress and IT level of the enterprise can be improved also. But since in this scenario Trust do not have any place, we cannot make manuals, because people will not trust on rules and top level protocols and, they will not use them. Furthermore, because people have collaboration, there is no need for forces and rules, a suitable construction can solve the problem with no need for force. Paying attention to this matter is good that in absence of Norm and Trust, the presence of contribution can be a result of organizational necessity. So we do not suggest usage of Government-oriented style. On the other hand, we can add necessary processes in information systems structure and by contribution of people in systems, the processes can be done. In addition, existence of contribution shows that the processes are operating and information systems can distinct the weaknesses of processes. So there is no necessity of using Process-oriented style.
In this scenario the lack of trust can make the contribution weak as time goes by. Because of that, we suggest paying more attention to the "Security" factor and also in architectural design, the security layers have to be designed accurately. Existence of contribution can be forced type, so trust is important in this situation. By improving the security we can consider the value of trust and so we can use it against losing contribution. Based on interviewees' selections, education has gained a great score. If people are not educated enough, they cannot use systems perfectly, this result in disappointment and loosing trust respectively, so the current contribution will fail.

5.1.4 IT-oriented relied on Education and e-GNI, for Tribe Credulous and Gray Age

Our recommended style is IT-oriented style. This style is applicable when the reason of the problems is related to operational troubles, so, the supply of the software, hardware and infrastructure equipments are needed. This package is suggested for two scenarios. In "Tribe Credulous", Trust exists but people's trust is not used and this trust should improve people's contribution and norms by means of various methods. People trust on information systems, but maybe because there is lack of equipments, so they cannot contribute. Because of this, providing technical infrastructure may encourage people to use and contribute in the system. However, the risk of trust castrating may occur if the infrastructure and equipments are not suitable or designed at proper time.
In "Gray Age", organizations are intermediate level in social capital. In this case, we can use information technology but the speed of improvement is low and the usage of high level of technology is not easy. In this situation, infrastructures are important and IT-oriented style is recommended. In this scenario the Process-oriented style is useless because people resist against new processes and primary changes which are the result of reengineering. Because people are at intermediate level so, they do not accept manuals easily. So, Government-oriented style is also useless. Overall, it seems that the IT-oriented structure is the best but the speed of implementing cannot be too much.
In this package, "Education" and "e-GNI" are the most important factors in G2G. e-GNI is mostly used as a communicational base in IT-oriented style. Because, in this style infrastructures are important and as we mentioned before, e-GNI is kind of communicational infrastructure. On the other hand, in forth scenario, trust exists and probably the reason of not contributing is lack of communicational infrastructure and equipments. Also in "Gray Age" scenario, we should pay attention to e-GNI factor in order to provide easier communication. Because any person has a level of maturity, the role of e-GNI is changed to prepare better services.
"Education" factor in IT-oriented structure is a significant part. This factor exists in all packages in which IT-oriented style is suggested, except in second package. The most important reason for the importance of education is that IT-oriented style is toward technical problems and technical concepts require education. Recognition and understanding of how to use equipments, increase Partnership and people's trust on system. In Gray Age although Trust, Partnership and Norm are in intermediate level but each one can cover the other's weakness.

5.1.5 Process-oriented relied on Culture and Location, for Seventy-two Nations

In this package, our suggestion is to use Process-oriented style. Generally, in case of low level of norms in organizations we cannot use Government-oriented style, because implementation and acceptance of manuals need norms. This package is used for fifth scenario in which norm is low and we have to use Process-oriented and IT-oriented structures. The Partnership and Trust are high but it doesn't lead to make norms. The reason is that probably the problems of processes. So, we have to analyze the current process in order to reengineer or add new processes. Information technology can mechanize the existing processes and because people's partnership level is high they use reengineering system but they are not satisfied from processes. This may reduce the Trust and Partnership level and information levels as time goes by .
In this package, use of "Culture" and "Location" is recommended. This package is suggested for fifth scenario in which Partnership and Trust level is high while the Norm level is low. One of the important reasons is lack of Culture and recognition. So, defining Culture is important in order to make common norms among people.
The second factor of G2G which is important is "Location". Enterprises are different in cultural and structural views and for this reason we need to consider Location. Low level Norm in this scenario can be the result of difference in Culture and Norm of governmental organizations with each other. In fact, in this scenario people contribute in systems but they deal with norm's paradoxes. So, they may lose their Trust or create new common norms. The occurrence of each case is dependent to the level and type of difference in Culture and Norm.

5.1.6 Process-oriented relied on education and e-GNI, for Cat-Dog

In this package the Process-oriented structure is suggested with respect to education and e-GNI. This package, which is recommended in sixth scenario (Cat-Dog), has low level Trust and this prevent us to use Government-oriented style, as people do not rely on manuals. The most important problem in using equipments and IT are shortage of Trust. However, the increase in Trust level may occur during use of IT. Although in this scenario people have Partnership and Norm but there is no Trust and this shows that employees behave studied. As a matter of fact, in IT-oriented style the risk of failure and unwanted consequences is high, so the Process-oriented structure is preferred. The other point in using Process-oriented structure is that we should not use reengineering and implementing comprehensive and sudden changes because it increases the probability of failure since it irritate the distrust feeling of employees.

The lack of Trust might be the result of lack of recognition and ability. In fact, because people cannot work in systems properly, they do not rely on them. So, in this package, there is high insistence on education. Indeed, the second important factor is e-GNI. People are intended to collaborate with each other and this makes the role of e-GNI important as a communicational base. Also, communication and collaboration extension improves the Trust level.

5.1.7 Government-oriented relied on Culture and e-GNI for Failed Intimacy

In this package, Government-oriented architecture and "Culture or Promotion" should be used as our recommendation. In this package Failed Intimacy, Norm and Trust level is high but Partnership is low. In other words, we can say that social situation in organizations are suitable but employees have difficulties in communication. Because of this, there is no need of detailed analysis and we can consider them as black boxes since, detailed analysis upon organization can disturb other factors. In other side, people have Trust and Norm, so they obey rules and by means of protocols and suitable orders, we can make them contribute to the system. Since, we do not change their inner structure the level of resistance has been decreased. Regarding to discuss issues, the best style is Government-oriented structure.

In this package, cultural topics have been regarded. Because, employees have enough Trust and Norm, but they do not use them. This can be the result of cultural weaknesses. There should also be enough concentration on "Culture or Promotion". The other reason can be the lack of equipments and proper communicational condition. So, we have to use e-GNI too.

5.1.8 IT-oriented relied on Education and Culture for Noah's Ark

In "Noah's Ark" in which all the social capital factors are at the best level, information technology is easy to apply. Actually, the social situation is ready and all the concentrations should take place on technical problems and our attempt is to improved organization to its maturity by means of best and updated technical equipments. In this case and in IT-oriented style we have to pay more attention to technical layers. In this scenario, people accept the manuals but they are at good level of social capital thus, we can use Government-oriented style but it is better for them to delegate requirements recognition and communication ways. Of course, we have to take care of social capital factors to not to become weak because of excess focus on technical concepts.

As we mentioned earlier, education is an important factor which is often parallel with IT-oriented architecture. Beside all discussed concepts related to Education, it should also improve the information technology and computer knowledge of employees, since we are always facing with new services and technologies. The other important factor in this package is "Culture and Promotion" factor. Technical problems are supported in different ways but we should be aware of missing Culture and social troubles. Technical attention may weaken social capitals. Hence, this factor has to be well-considered.

We summarized the results in Table 6.

Table 6. Assigning the proposed package to the scenarios as the research result

Scenario	Proposed Package	Description	Limitations
Death Valley	Process-oriented relied on culture and e-GNI	The aim is process reengineering. And, culture building and appropriate infrastructure should be considered.	Situation is very fragile and may lead to the death of systems. Processes must be designed carefully.
Cold Smile	IT-oriented relied on Culture and e-GNI	The norm allows the use of IT.	Norms while being beneficial can be a barrier to use of technology. Design of the technologies should be based on the existing norm.
Infertile Commonalities	IT-oriented relied on Education and Security	No confidence could be due to a sense of insecurity. Use of the technologies should be educated.	If the security systems are not designed carefully and the no sense of the security bring through education, participation in may goes away too.
Credulous Tribe	IT-oriented relied on Education and e-GNI	The problems due to the lack of tools, and IT should create these tools. Packages are similar for the two scenarios but the behaviors in each scenario are different.	The quick design and implementation should be considered. A delay in implementation may lead to lose of the trust. e-GNI is a tool for communication.
Seventy-two Nations			High speed on the run of the system can cause the damage to social capital thus, should be careful. e-GNI should tries to serve better services.

Scenario	Proposed Package	Description	Limitations
Cat-Dog	Process-oriented relied on Culture and Location	Lack of the norm is due to the type of processes or culture. Location is necessary to establish the norm.	Lack of norm and organizational differences should be considered otherwise, the process will fail.
Failed Intimacy	Process-oriented relied on Education and e-GNI	Designing new processes should be done, because people do not trust the current processes.	In reengineering and designing new processes, speed should not act quickly. And also, implementation should not be done broad and precipitate. In fact, speed can cause failure.
Noah's Ark	Government-oriented relied on Culture and e-GNI	The behaviors are prescriptive. Network administration can give a communicational tool.	If norm have not considered in the instructions, the resistant of the staff members may increase.
Gray Age	IT-oriented relied on Education and Culture	Technical training is required to improve IT literacy in organizations and culture is used to prevent weakening of social capital.	Excessive focus on technical issues can cause weakening of social capital being.

6. Validation

Many studies have been done by experts particularly in validation of qualitative research. In Langmead and Gordon's point of view, qualitative researches require the participation of a few respondents, which is used in cases where there is a concern about being understood of how phenomena occur and how their relationships are [33]. In qualitative researches, essentially, the researcher is part of the research process and in this case, validation is not beneficial [11].

Scientific accuracy in qualitative researches, which is based on tangible evidence, usually uses a variety of research techniques such as experimental verification and validation of findings by participating members [25]. However, the Guba and Lincoln are described verifying of findings by participating members as a continuous process during data analysis [12]. Researcher sensitivity; sensitivity, creativity and flexibility researcher, methodological coherence; aligning research questions and elements of research methods, appropriateness of sample size; selecting qualitative study among subjects with the best knowledge of research subject, simultaneous data collection and analysis; mutual interaction between what is known and what must be considered and, theoretical thinking; smart look to the topic for continuous review of data are including strategies that should be considered during the process of qualitative research that ensure scientific accuracy [23]. In this study we tried to mention these five cases accurately.

In another perspective, accredited to the results of a qualitative research is very important because the results should be reliable for research readers. Otherwise, there is no reason to do a study. One of the methods that can be done for validation of qualitative research is external audit which is the use of external expert opinions [26]. In this study, we have selected some organizations in Iran which are consistent with the scenarios then we review responses of proposed packages on them.

6.2."SHETAB" System

SHETAB is bank information exchange network where banks are connected to the national switch, and in this way exchange of information relating to transactions between the banks will be provided. Generally, the level of confidence is low in Iran and consequently the Trust level is low in state banks. Also, people have many differences with the normative point of view but also have engaged in using the systems. In fact, Iranian banks are in the third scenario (Infertile Commonalities). In this article we have suggested IT-oriented relied on Education and Security Proposed Package for this scenario. This package is consistent with the behavior of the banks. In Iran, banks are leading in the use of information technology. Extensive use of IT has led the process to facilitate the implementation process and in this way, trust in people has been created. Also, before hiring people, training two or more months will be held for staff members. The necessary security layers are on the banks agenda in providing services. This shows that this Proposed Package can be efficient because in the run has been held accountable.

6.2.Regional Power Company

In Regional power companies in Iran, especially in major cities, interest of using of information systems is very high. In these organizations, participation is in terms of legal obligation and demands of citizens. And, because they have similar business structure they have formed a common Norm but, Trust in organizational systems and processes, is low. Thus, they are placed in the Cat-Dog scenario and according to the results of this paper, they should use Process-oriented relied on Education and e-GNI Proposed Package. But, their current behavior is IT-oriented relied on education. And although they have spent considerably a huge amount of money to implement information systems, but have not had a good performance, and also confidence remains low and even Norm are now being undermined. It seems that if the legal requirements and popular pressure are removed, the partnership will goes away. Thus, the behavior is taken is not correct and according to experts and interviewees viewpoint they should have changed in their process to reach the organizational excellence.

7. Conclusions

In Iran society where information and telecommunications technologies have become so vital in governmental area, the nature of e-government policy in G2G project must constantly gain interest on social capital. The main objective of this paper is to study the influence of the social capital on the EA of G2G and the most important result of this research is its Proposed Packages. The concept of each Proposed Packages offers a way that where we have some of the elements of social capital which style of EA of G2G we should use. As a conclusion, it can be recommended that e-government service providers and decision can define the level of social capital factors in enterprises and based on them use appropriate Proposed Packages. In this paper, we propose eight packages and then we offer these packages to the nine scenarios which we have designed. Each of these packages has its risks and possible complications, especially in their EA style. To achieve useful results, we focus on the use of two tools; SP and Interview.

The route of e-Government EA is currently based on general and political plans and also technical tools and science, which does not include citizens, society or social capital. However, the ICT

infrastructures which are installed for G2G are based on social capital administration and people characteristics. Previous researches are not including this issue that whether the citizens can influence on G2G EA or not. But, in this research we have shown the effect of social capital on it. Also, in previous researches there is no certain EA for organizational interactions. However, in this study with regard to the level of social capital, we propose EA styles. Considering the level of social capital factors in organizations, we have presented the some Proposed Package of EA in implementing G2G in organizations which had not been done before.

References

[1] Ambler, S.W., 2003. Agile Enterprise Architecture: Beyond Enterprise Data Modeling. URL: http://www.agiledata.org/essays/enterpriseArchitecture.html

[2] Architecture guidelines for trans-European telematics networks for administrations. 2004. IDABC, Enterprise and Industry DG, version 7.1, Brussels

[3] Ashena Group, 2005. E-Government: In Order of the Secretariat of the Supreme Council of Information of Iran. Secretariat of the Supreme Council of Information of Iran

[4] Australian Government Architecture Reference Models. 2007. Version 1.0

[5] Bellemare, C., & Kroger, S. 2007. On Representative Social Capital. European Economic Review, 51, 183–202

[6] Bernus, P. 2003. Enterprise Models for Enterprise Architecture and ISO9000:2000. Annual Reviews in Control, 27, 211–220

[7] Bodwell, W., & Chermack, T. J. 2010. Organizational Ambidexterity: Integrating Deliberate and Emergent Strategy with Scenario Planning. Technological Forecasting & Social Change, 77,193–202; Wilson, I., & Ralston, W. 2006. Scenario Planning Handbook: Developing Strategies in Uncertain Times. South-Western Educational Pub, Belmont, CA

[8] Bouma, J., Bulte, E., & Soest, D. V. 2008. Trust and cooperation: Social capital and community resource management. Journal of Environmental Economics and Management, 56, 155-166

[9] Cairns, G., Wright, G., Bradfield, R., Heijden, K. V. D., & Burt, G. 2004. Exploring e-Government Futures Through the Application of Scenario Planning. Technological Forecasting & Social Change, 71, 217–238

[10] Chen, A. J., Pan, S. L., Zhang, J., Huang, W., & Zhu, S. 2009. Managing e-government implementation in China: A process perspective. Information & Management Journal, 46, 203–212

[11] Creswell, J. W. 2007. Qualitative Inquiry and Research Design: Choosing Among Five Approaches. Sage Publications, Thousand Oaks, CA

[12] Devadoss, P. R., Pan, S. L., & Huang, J. C. (2002. Structurational analysis of e-government initiatives: a case study of SCO. Decision Support Systems, 34, 253-269

[13] Esteves, J., & Joseph, R. C. (2008. A Comprehensive Framework for the Assessment of e-Government Projects. Government Information Quarterly, 25 (1, 118-132

[14] Foster, M. J., & Kitching, J. (1989. Measuring the Effectiveness of Strategic Planning: The Process Calibration. Kingston upon Thames: Kingston Business School. Occasional Paper, 10

[15] Fukuyama, F. (1995 Social Capital and the Global Economy. Foreign Affairs, 74 (5, 89-103

[16] Garg, A., Kazman, R., & Chen, H. (2006. Interface Descriptions for Enterprise Architecture. Science of Computer Programming, 61,4-15

[17] Ghazinoory, S., & Heydari, E. (2008. Potential Impacts of Nano-Technology Development in Iran. IEEE Technology and Society Magazine, 27 (4, 37-44

[18] Grootaert, C., & Thierry V. B. (2002. Understanding and measuring Social Capital: A Multidisciplinary Tool for Practitioners. The World Bank; Engstrom, K., Mattsson, F., Jarleborg, A., & Hallqvist, J. (2008. Contextual social capital as a risk factor for poor self-rated health: A multilevel analysis. Social Science & Medicine, 66. 2268-2280; Woolcock, M. (1998. Social capital and economic development: Toward a theoretical synthesis and policy framework. Theory and Society, 27 (2, 151–208

[19] Guba, E.G., & Lincoln, Y.S. (1989. Forth generation evaluation. Newbury park, CA: sage

[20] Guijarro, L. (2007. Interoperability Frameworks and Enterprise Architectures in e-Government Initiatives in Europe and the United States. Government Information Quarterly, 24, 89–101

[21] Hagan, P. J. (2004. Guide to the (Evolving Enterprise Architecture Body of Knowledge. A Project of The MITRE Corporation, Case No. 04-0104, 04-0105

[22] Heeks, R., & Bailur, S. (2007. Analyzing e-Government Research: Perspectives, Philosophies, Theories, Methods, and Practice, Government Information Quarterly, 24, 243–265

[23] Howe, K., & Eisenhardt, M. (1990. Standards for Qualitative (and Quantitative Research: A Prolegomenon. Educational Researcher, 2-9

[24] IEEE Recommended Practice for Architectural Description of Software: Intensive Systems. 2000, IEEE Standard; E-Gov Enterprise Architecture Guidance Common Reference Model. 2002.FEA Working Group. Draft Ver. 2.0; Federal Enterprise Architecture Security and Privacy Profile. 2010. Chief Information Officers Council, Version 3.0, URL http://www.cio.gov/Documents/FEA-Security-Privacy-Profile-v3-09-30-2010.pdf

[25] Janesick, V. 1994. The Dance of Qualitative Research Design. Handbook of Qualitative Research, Thousand Oaks, sage, 251

[26] Johnson, B., & Christensen, L. B. 2003. Educational Research: Qualitative, Quantitative and Mixed Approaches. Pearson Education US

[27] Joia, L. A. 2004. Developing Government-to-Government enterprises in Brazil: a heuristic model drawn from multiple case studies. International Journal of Information Management, 24, 147–166

[28] Kolb, D.S., & Clay, S.B. 2000. Scenario Planning: A Tool for Planning Under Uncertainty. The Alliance Report

[29] Korte, R. F., & Chermack, T. J. 2007. Changing Organizational Culture with Scenario Planning, Futures, 39, 645–656

[30] Nahapeite, J., & Ghoshal, S. 1998. Social capital, intellectual capital and the organizational advantage. Academy of Management Review, 23 2, 242-267

[31] Nakagawa, Y., Shiroyama, H., Kuroda, K., & Suzuki, T. 2009. Assessment of Social Implications of Nanotechnologies in Japan: Application of Problem Structuring Method based on Interview Surveys and Cognitive Maps. Technological Forecasting & Social Change, TFS-17189, No of Pages 24

[32] O'Brien, P. 2000. Scenario Planning: A Strategic Tool. Bureau of Rural Sciences, Department of Agriculture, Fisheries and Forestry, Australia AFFA

[33] Popay, J., Rogers, A., & Williams, G. 1998. Rationale and Standards for The Systematic Review of Qualitative Literature in Health Services Research. Qualitative Health Research, 8, 341-351

[34] Portes, A. 1998. Social Capital: Its Regions and Applications in Modern Sociology. Annual Review of Sociology, 24, 1-24

[35] Pulkkinen, M., Naumenko, A., & Luostarinen, K. 2007. Managing information security in a business network of machinery maintenance services business: Enterprise architecture as a coordination tool. The Journal of Systems and Software, 80 10, 1607-1620

[36] Putnam, R.D. 1995. Bowling Alone: America's Declining Social Capital. Journal of Democracy. 6 1, 65-78

[37] Shan, T., & Hua, W. 2006. Solution Architecting Mechanism. Proceed of the 10th IEEE International EDOC Enterprise Computing Conference, 23-32

[38] Toh, K.T.K., Nagel, P., & Oakden, R. 2009. A business and ICT architecture for a logistics city. Int. J. Production Economics, 122, 216–228

[39] Varum, C. A., & Melo, C. 2010. Directions in scenario planning literature: A review of the past decades. Futures, 42, 355–369

[40] Wastell, D., Kawalek, P., Langmead-Jones, P., & Ormerod, R. 2004. Information systems and partnership in multi-agency networks: An action research project in crime reduction. Information and Organization, 14, 189–210

[41] Winter, L. 2000. Towards a Theorized Understanding of Family Life and Social Capital. Australian Institute of Family Studies, Working Paper, No.21

[42] Zachman, J.A., & Sowa, J.F. 1992. Extending and Formalizing the Framework for Information Systems Architecture. IBM Systems Journal, 31 3

[43] Zarei, B., & Ghapanchi, A. 2008. Guidelines for Government-to-Government Initiative Architecture in Developing Countries. International Journal of Information Management, 28, 277– 284
iomedical Materials Research.5:161-22