A FRAMEWORK FOR ORGANIZATIONAL ARCHITECTURE OF ELECTRONIC CITY AND ELECTRONIC MUNICIPALITY

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Abstract
This study provides a framework for enterprise architecture in electronic city is electronic municipality. Nowadays, information technology as an emerging phenomenon has a special place in the world. Development of information and communication technology causes many changes in various fields, including emerging e-cities, municipalities and citizens. However, e-city and e-municipality need essential enterprise architecture. In order to develop enterprise architecture of e-city and e-municipality, enterprise architecture maturity method should be applied. Therefore, one of the most important needs of organizations is to choose important activities according to limitations. The studies show that there is a close relationship between IT, enterprise architecture, e- city and e-municipality. This study aimed to clarify the concept of IT, enterprise architecture, electronic city and e- municipality and how they are related to each other. Is the existence of each of IT, enterprise architecture, electronic and electronic municipal requires each other?

Keywords: Enterprise architecture, e-city, e-municipality, e-government, e-citizen, service-oriented architecture

Introduction
Today, information technology is created no doubt a lot of changes in all aspects of social and economic of human living and its impact on communities is somewhat that the world are changing with tremendous speed from an traditional and industrial societies to an information society. It seems that soon different IT applications impact on all routines community affairs directly or indirectly. This speed of effective and expanding of the phenomenon is very much so that it is expected to occur fundamental changes in cultural, economic, social and political structures as well as in the traditional bases of community governance and introduce a new system of management. Due to the longitudinal and latitudinal development in the community and with regard to its effect on forming culture character, information technology is very convenient and efficient tool for cultural growth of the society [1]. Global approach in recent years has taken steps towards e-communities. Today, society is more advanced that in terms of information has more speed and capability in production and information exchange   [2] In this regard, one of the concepts has been studied extensively in very advanced societies in recent decades and has been implemented successfully in some countries is the concept of e-city and e-municipality. In an e-city, all services the residents require provided by information networks. Thus, there is no need any

more for physical movement of citizens to access government services and private institutions. In an e-city, physical offices replaced by digital agency offices and organizations and devices such as municipalities, public transportation, regional water agency and etc. provide most of their services to their subscribers and customers virtually or using facilities that ICT provides for them. This type of projects for implementation requires a comprehensive plan and also architecture and design of its different frameworks. The information architecture that architecture of electronic cities is developed based on it can be defined using Clinger-Cohen's law. The law that is the most important law about necessity of information architecture planning in U.S. government agencies is defined the information architecture as follows: "Information architecture is an integrated framework for the promotion or maintenance of new information technologies in order to achieve the strategic goals of the organization and management of its resources." [3].

Electronic City

The term "electronic city" was proposed in 1994 and in a conference bout Digital city. This program administered in 1996 in Some European cities like Helsinki and Amsterdam. Electronic city that developed along with the development of IT during the recent decades, entered the social and economical arena that is: the use of IT and communication For the purpose of providing onetime and direct services for citizens; 24 hours a day. Electronic city provides the required Facilities in order to have access to Information and services; providing further opportunities for people to participate in some activities. There have been different definitions for Electronic city. In other words, in electronic cities all requirements of citizens are provided through computer networks. Therefore, electronic city is somehow a relative term; the more services provided by computers, the more the meaning of electronic city will be clarified [2]. Odendaal defines electronic city as a city in which the city plans to invest on opportunities created by IT and communication and for the purpose of increasing success and impression [4].

Electronic city is such a city has telecommunication and has controlled by ICT department to exchange information. In an electronic city not only citizens use virtual city, ministries and electronic organizations but also they do their routines such as daily purchases through network. It should be noticed that the electronic city is a real city has various citizens, offices, organizations and etc. In an electronic city that just certain communications and social interactions and provide a major part of their daily needs is done through the Internet. Most features of this informing network can be searched in the urban transport network and informing about disaster. When disaster occurs resorting to this system can manage occurred disaster as soon as possible [1].

The development of e-city

A historical development mantra was: "Every job is a good job, all we can get is fine. This is no longer true. Perhaps the most important fact to recognize, respect is due to the development in e-Cities that today the development is much more than just recruiting a company in your community or in the new cables and wires. Development is a process pipeline, if you do not see it this way as a continuous Movement forward toward improvement, then you are bound to repeat the past. [5].

Since 1990, developing Word Wide Web technology. Since 1993 is possible the free use and personal use of this technology and digital network or Internet. This new technology allows the communication between people anywhere in the world. As we all know, the number of Internet users has been a large increase in the world and provides exceptional dissemination of knowledge [6].
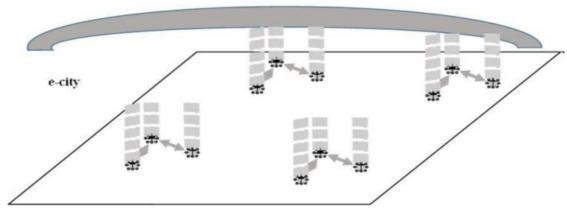
Figure1: E-City

Yet, in fact, is the spread of an international Internet community. For example, in this conference, people have direct reference traveled people here and people that enrolled of Internet application. After the conference, probably, several groups of people keep in touch, even though Internet applications. Therefore, the e-community is formed. The common interest, systems and similar costumes bravery in e-relationships creates the e-community. In the same way that membership in the local community creates a sense of identity, including members of the e-community creates a sense of identity. More and more people have a sense in addition to local and national identity for global identity. In this situation, the limit of time. Actually, our community is in simultaneous direct relations, transport links and e-relationships. , The Day, but have only 24 hours. So, for every human being is not possible to receive regular contacts with all communities. Finally, I remember that some human activities can be realized by digital applications. However, you have made digital applications, a complete system of creation, customer service and maintenance. The applications are in constant change. Governments or private companies can provide all kinds of applications to create. [7]

Electronic municipality

In fact, municipality is a set of mechanisms related to city and citizens whose goal is to provide spiritual and material needs [8]. One of the important tools that enable municipalities to provide services to the citizens of community is to access to new information technologies. This new technology enables municipalities to provide information and services effectively to their communities, and to increase participation in local organizations. Also, municipalities are able to support local organizations more widely in order to achieve better business. To achieve this goal, municipalities need to make collective decisions to choose a strategic direction. To do this, the best strategy is electronic municipality (local government) [9]. It was first introduced in England in 2000 [10]. Thus, the electronic municipality is an offers its services in the areas of municipal tasks to citizens using information technology quickly, available and securely [11]. In such a system, citizens receive all services they need the best possible way and securely. Municipal also will control its and citizens' activities using information technology and focusing on services and information and will be ensured to quality and availability of services offered by them [12]. E-municipality is one of the main plans for developed countries and some of the developing ones in recent years. International studies has brought up the insight of government people to the e-municipality as the winning card in their rule, in a way that a part of the annual budget in many of these countries related to the feasibility study of e-municipality project in different cities, or development of infrastructures in order to improve the current system in organizations and through the society. [13]

Enterprise Architecture

In the middle of 1980, John Zachman, the Consultant business plan, developed in the Zachman Framework, which is designed to serve as a blueprint, or architecture, to facilitate the integration of IT systems. The "enterprise," for which architecture is created, refers to "The one area and the mission of the organization or rather than transcends organizational boundary (e.g. financial management, homeland security)" represents the architecture of the" big picture "view of how the enterprise operates and offers his services. Enterprise architecture (EA) serves as the blueprint of the business operations of the organization, and knowledge and technology necessary to carry these operations, both currently and prospectively. Back to you Why not be published tool. It is to comprehend it to be scalable and to the nature of the increase of the future needs. EA represents the business of design-driven approach to management that emphasizes interoperability and data sharing [14]. So enterprise architecture (EA) is a full expression of the company, a Master Plan "acts as a cooperative force" between aspects of planning activities, such as goals, visions, strategies and governance principles, aspects of the business such as business terms, the organizational structures, tasks, activities and information aspects of automation such as information systems and databases, and the technological infrastructure of the business such as computers, operating systems and systems networks. In a large modern enterprise, a rigorously defined EA framework may require vision capable of acquiring "whole company" in all its dimensions and complexity. Enterprise Architecture (EA) program supported by a framework and approach that is able to coordinate many facets that make up the fundamental essence of a business in a holistic approach [15] Architecture is usually divided into different types of architecture or enterprise or ownership. For Aerts et al. (2004) identify three domains of architecture, in which she replied: [16]

- Business architecture defines the nature of its business environment.

-The information system architecture (IT Architecture) details the information system components and business interaction.

- Your platform architecture (or architecture) architecture is the kind of resource that was being done to lay a platform for the construction and operation of systems in the enterprise. [17]

Enterprise architecture definition has changed and evolved in recent years. America electronic government law in 2002 explained the following meaning for enterprise architecture:

- A database of strategic information that will determine the mission
- Information that is necessary to accomplish the mission
-Technologies that are needed to accomplish the mission
-Transitional processes for implementing new technologies in response to changing needs and include three key parts:

a) Current architecture
b) Optimal architecture
c) A transitional program [18]

Two parts of enterprise architecture are management and description method.

a) Management plan is in line with the following:

- To converge resources include two subjects (resources planning and standards certainty)

- Standardization policies include resource integration at the state level
- support of decision making include financial control and configuration management
- Avoid of making resources useless include getting help of life cycle for development and Management

b) The description method is in line with following:

-Enterprise Architecture approach includes an framework of models and methodology of applying architecture

-The current architecture includes a look at the status quo, strategy, processes and resources

-The optimal architecture includes a look at the status quo, strategy, processes and resources

-Architecture management program, including a plan for transition from the current situation to the desired situation [19]
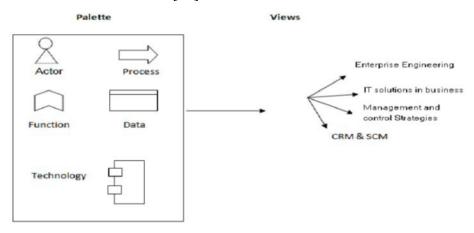

Figure 2: Enterprise Architecture

Enterprise Architecture Maturity Model

While the task of implementing and maintaining a comprehensive enterprise architecture program can be daunting at times may seem, the results speak for themselves. The Enterprise Architecture Maturity Model, shown below, and the following section reflect the phases to see an organization such as its architecture Program matures.
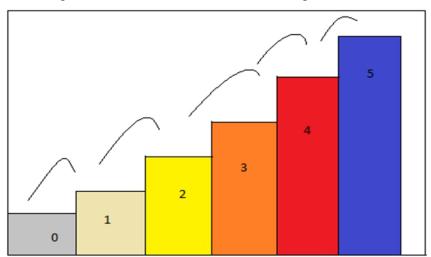

Figure3: Enterprise Architecture Maturity Model

The model follows the path of an organization as its enterprise architecture program matures, and sets standards to measure the performance and the path, which is a natural progression in the development of enterprise architecture. The Nascio tool kit provides guidance for the development process.

In the following sections, each of the defined levels of Nascio Enterprise Architecture Maturity Model. Each level contains statements that are indicative of an EA program at this level. These statements are organized into the following categories Enterprise Architecture:

• Administration - Governance Roles and Responsibilities
• Planning - EA program road map and implementation plan
• Framework - processes and templates for Enterprise Architecture used
• Blueprint - collection of the latest standards and specifications
• Communication education and distribution of EA and Blueprint detail
• Compliance - compliance with the published standards, processes and other EA elements and processes to document, follow these norms and deviations
• Integration - contact points of management processes to the EA
• Commitment - support the EA program throughout the organization. [20]

The important and valid frameworks of enterprise architecture maturity are [21] (2002) EAMMF, EAMM (2003) [22], E2AMM (2004) [23], OMB (2005) [24], GARTNER (2005) [25], Oregon State of (2007) [26]. Each of these frameworks using certain indicators measures the maturity level of enterprise architecture. [28]

Table 1: Characteristics of Assessment Framework of Enterprise Architecture Maturity Model

Framework name	Provided by	indicators
EAMMF (Enterprise Architecture of Maturity Model Framework)	GAO Five levels	1- Showing commitment to perform activities and tasks 2- Opportunity to accomplish activities 3- Confirming activities and tasks by products and following results 4- Survey of successful and satisfactory completion of activities by measuring quantity and quality
EAMM (Enterprise Architecture of Maturity Model)	NASCIO Six levels	1- Rules and Regulations 2 - Planning 3 - Framework 4- Business Plan 5-Communications 6-implementation 7 - Integration 8 - cooperation (synergy)
E2AMM (extended enterprise architecture maturity assessment)	IFEAD Six levels	1- Mutual influences business strategy and information technology strategy 2- Extensive Organizational participation 3- Executive management participation 4- Commercial units participation 5- A department for extensive enterprise architecture planning 6- Development (implementation) of extensive enterprise architecture 7- Results of extensive enterprise architecture 8- Strategic monitoring 9- Organization program management 10- extended enterprise architecture 11- budgeting and purchase strategy of organization
Maturity assessment model of Enterprise Architecture to governance management and budgeting (OMB)	OMB Six levels	1- change (oriented architecture strategy - strategic orientation) 2- integration (ability to work together - data -business logic- interface) 3- Convergence (components - technical platform - Performance - Security) 4- Convergence of business (strategic goals - and business goals)
Maturity assessment enterprise architecture framework GARTNER	GARTNER	1- Scope and Capability of Enterprise Architecture 2- Support and participate in board 3- The process of defining enterprise architecture 4- Business concepts 5- Enterprise Architecture Concepts 6- Defining desired situation 7- Enterprise Architecture team 8- Effects of enterprise Architecture
State Enterprise Architecture Maturity Assessment Model Oregon	State of Oregon Five levels	Gartner indicators have been used and several sub-indexes are considered for each one.

Service Oriented Architecture E-City and E- Municipality

SOA is lightness of design, which focuses on all aspects of implementation and using business services during their life cycle. It also is a way to prepare the required infrastructure for the exchange of information among different applications on any OS and programming language they've been created [28, 29]. SOA is a standard framework and its goal is increase of IT agility to rapidly respond to business changes and create an integrated interface for city users [30, 31]. Using this architecture can decrease the cost of developing new elements as well as the existing elements development and also speed, reliability and security will be increased and will improve the integrated management of city network [32]. The main goal of the provide a SOA is to cope with challenges such as the lack of integration and interaction of

information systems in organizations and lack of the IT's ability to adapt the business's changes speed according to the organizations constant need to changing of processes and services, difference among experts of IT and experts of business in views [28, 33].

Table 2: The Most Important Goals of Offering a SOA

Upgrade IT coordinated with business
Improvement of the interaction between organizations
Flexibility of IT to respond to on-going changes in business
Standardization and integration of platforms and IT substructures
Flexibility of software components and improvement of the level of reuse

Built Infrastructure E-City and E- Municipality

Availability and quality of ICT infrastructure is important for e- cities and e-municipality [34]. Indeed, smart grids, object, play a key role in the creation of e- cities and e-municipality of reality [35]. ICT infrastructure includes infrastructure wireless network (Fibre Channel Wi-Fi, Wi-Fi, kiosks) [36-37], systems-oriented services [38, 39]. Implementation of the ICT infrastructure fundamental importance for the development of low town and depends on many factors relating to the availability and performance. It's small, it focuses on the literature ICT infrastructure obstacles smart cities initiatives. How is the administrative and organizational unity, we will refer to the technological barriers of e-government because the e- cities and e-municipality initiative "is similar to the e-Government initiatives in the use of ICT [8]. Introduced a number of factors related to the implementation of ICT. Table 3 presents a series of challenges, grouped in three dimensions, IT Infrastructure, Security and Privacy, and operational.

Table3. Factors of built infrastructure E-City and E- Municipality

Dimension	Challenges
IT infrastructure	- Lack of integration across government systems - Existing internal systems have restrictions regarding their integrating capabilities - Lack of knowledge regarding Interoperability - Availability and compatibility of software, systems and applications
Security and privacy	- Threats from hackers and intruders - Threats from viruses, worms and Trojans - Privacy of personal data - High cost of security applications and Solutions - Accessibility
Operational cost	- High cost of IT professionals and consultancies - High cost of IT - Cost of installation, operation and maintenance of information systems - Cost of training

An integrated framework E-City and E- Municipality

Based on the literature on the concept of e-cities and e-municipality and the factors described above, we have developed a comprehensive framework to explain the relationship and influence between these factors and intelligent urban initiatives. Each of these factors is important to be considered in assessing the extent of e-cities and e-municipality and when dealing with smart cities initiative. The factors are the basis for the comparison of how cities are providing their smart initiatives, implementation of shared services and related challenges. This set of factors is presented as a tool to promote understanding of the relative success of the various initiatives Smart City implemented in different situations and for different purposes. Similarly, this framework can help solve real impact on the types of variables (organizational, technical, context) the success of the initiative intelligent.
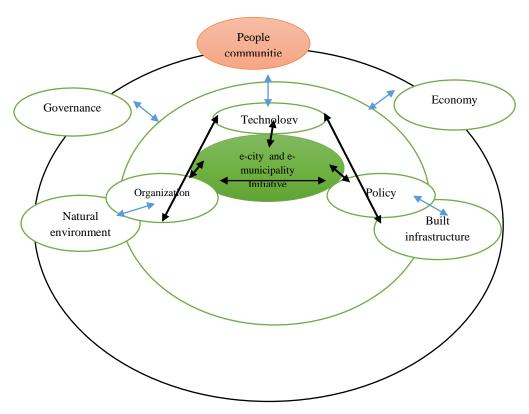
Figure 4: integrated framework E-City and E- Municipality

It is expected that while all the influence factors are bidirectional smart urban initiatives (each can be influenced, and has an impact on other factors), at different times and in different contexts, some are more influential than others. In order to take account of different levels of impact factors in our proposed framework are represented in two different levels of impact. External factors (management, people and communities, the environment, infrastructure and the economy) are somehow filtered or influence over influential internal factors (technology, management and policy) before affecting the success of e-cities and e-municipality initiative. It counts both direct and indirect effects of external factors. The technology can be regarded as an intelligent agent meta urban initiative, because it can significantly affect any of the other seven factors. Due to the fact that many municipal initiative smart intensively through technology, can be seen as. The factor that in some way affects all other factors of success in this regard. [40].

Electronic City and Municipality Architecture

Electronics City and municipality as a structure for electronic services to citizens can be divided into four main layers (figure 5). These layers include stakeholders, service channels, electronic services, systems and servers (platforms). Electronics City and municipality stakeholders can include all citizens, urban organizations, merchants and traders, factories, industries, and finally the government and government agencies.[41] Different browsers, kiosks, electronic-telecommunications systems and tools can be considered among of service providing channels. Electronic city services include wide range services such as electronic banking, electronic insurance, electronic transportation, electronic health, electronic education and etc. Systems and platforms that provide electronic city services are in last layer. On one hand, these systems are distributed in different organizations and places and each one is designed according to special technologies and on the other hand, has interaction and cooperation ability to work with other systems.
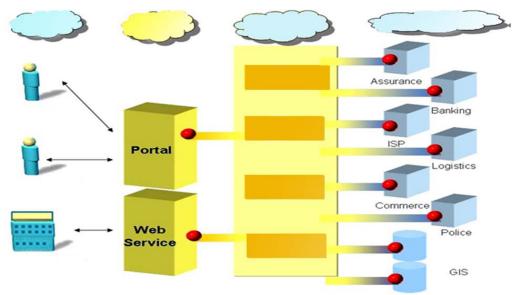
Figure 5: Layers of electronic city architecture

Conclusion

Today, the city is too vast and urban and social relations have been too complex. Also, we live in an age which is known as the information age. The most important indicator of information age is information technology, that along with it phenomena such as electronic government, electronic city and electronic municipal have emerged. Information technology requires and important and accurate architecture in order to provide its services to the government and electronic city and municipality and that enterprise architecture element is presented by Zachman in 1980s. In this regard, electronic cities like physical cities are need architecture and planning. Enterprise architecture is also used for electronic city architecture. We have used enterprise architecture layers that include stakeholders, service providing channels, electronic services, systems and servers (platforms) to clarify exact meaning of electronic city and municipality. In order to electronic city architecture done correctly, citizens and government personnel and administrative bodies should train to use information technology to meet their own needs and be skillful to provide services to others. Service channels also need to be carefully designed in order to have a trouble-free servicing. A small problem in each layer will be impaired all the system. So, we should use an architecture called enterprise architecture. Finally, based on our own research and others research we concluded that there is a closely relation between information technology, enterprise architecture and electronics city and each one of these elements needs other elements. For this reason, the architecture that we have proposed in a discrete layer we elements, such as the independence of services during a call by various stakeholders, re-use of municipal services and composition, transparency of inputs and outputs for easy identification of service options, stakeholders emphasis on quality control instead of process control, hide the inherent complexity of stakeholder cooperation the city's other information systems to increase the participation and satisfaction of users of the system.

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