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PRESENTATION OF IDEAL ENTERPRISE ARCHITECTURE FRAMEWORK TOWARDS E- GOVERNMENT DEVELOPMENT

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ABSTRACT

Always, e-government development faces with many challenges. Due to lack of integrity, modifications and cost waste, the challenges will occur in various types of government programs. Moreover, an ideal enterprise architecture framework to overcome obstacles is needed. The framework shall provide growth and development, increased profit, optimal solutions and reduced costs, it also should be act as analyst to be aligned with commercial goals. Ideal framework should be consistent, eliminate enterprise complexities, repeat the use of related services, propagate knowledge and share experiences. This paper tries to represent a criteria to select an ideal enterprise architecture framework for e-government development. The criterion are assessed through levels of weak, acceptable, good and excellent and eventually, the most desirable framework is selected for e-government development.

Keywords: *E- government, Enterprise Architecture, Enterprise Architecture Framework*

INTRODUCTION

Because of a wide range of e- government projects, the states are inconsistent and incoherent which no organizational reaction is formed. Development process, as a way for integrity, will result in reducing organizational architecture complexities. Enterprise architecture support and optimize commercial processes. It also defines based on strategic information to detail mission of an organization as well as technology and information required to do it.

The reasons of enterprise architecture for e- government development to be used include (Ojo *et al.*, 2012):

- Empowering mutual cooperation and providing technical and management standards in organization
- Empowering to share organizations' resources and decreasing information technology costs and commercial activities upon distinguishing opportunities to be used repeatedly
- Empowering common processes development and providing integral services

This paper aims to select an ideal enterprise architecture framework for e-government development.

Selection of an Ideal Framework

Framework is considered as a logic structure to classify and organize complicated information. It also explains different views of information system and responds to the following questions;

What: what entities have formed the system? What components are needed? How they connect to each other? What mechanisms have been used to connect each other?

How: How it works? What elements are required for integrity of system? What instruments should be used for integrity of elements?

Where: Where systemic elements are and how they connect? What are information and processes topology? How the topologies are controlled?

Who: Who can access under what classification and elements? How users are in interaction with systems? How users can control their access to resources?

When: When and what circumstances are took place? What is their hierarchy? How users are inform about details of completion, being ready, under process and work stop procedures?

Why: Why different systems are selected? What things are there in infrastructures architecture of a system? (Rezaei, 2005-06)

Growing needs to interact with e-government is the most important reason in global approach towards enterprise architecture. Indeed, the issue is so significant that lead to differentiate former approaches in

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information systems planning in view of architecture. To change old systems to new ones and establishment of their final integrity requires a framework to consist them and a desirable type which will guarantee it. Selection and adjustment of an ideal architectural framework plays a significant role in enterprise architecture to be operated. Also, selecting an architecture framework depends on reasons in using architecture and developed architectural characteristics (Yousefi *et al.*, 2011).

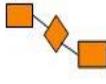
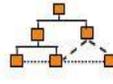
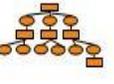
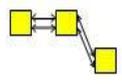
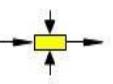
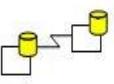
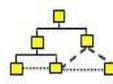
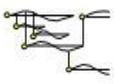
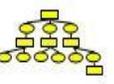
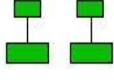
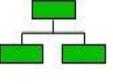
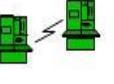
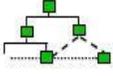
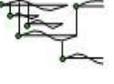
Enterprise Architecture Frameworks

There, many frameworks have been presented for enterprise architecture of which the most significant are TEAF, TOGAF, ZEAF, FEAF. Some of them are introduced for specific intentions and gradually turn to multipurpose ones (Mozafari, 2011).

Zachman Enterprise Architecture Framework (ZEAF)

Zachman presented his primary framework in 1987 and developed it in 1992. The main goals are analysis of enterprise architecture and modeling. It is subtitled with one- row table to show shareholder of a hierarchy of project. They are planners, owner, designer, manufacturer and contractor. Any subtitle will make results of limits and organization documentary, commercial, systemic, technology and components models. A wide range of information is defined for each subtitle, 1) what: information, 2) how: it works and process, 3) where: hardware/ software status, 4) who: being expertise and reliable people, 5) when: scheduling needs of commercial process, 6) why: motivation (Rezaeirad *et al.*, 2014).

Table 1: ZEAF Enterprise Architecture Framework (Rezaeirad, 2014)

Abstraction Perspective	DATA What	FUNCTION How	NETWORK Where	PEOPLE Who	TIME When	MOTIVATION Why
SCOPE Planner Contextual	List of Things- Important to the Business 	List Of Process- The Business Performs 	List of Locations- In which the Business Operates 	List of Organizations- Important to the Business 	List of Events – Significant to the Business 	List of Business Goals and Strategies 
ENTERPRISE MODEL Owner Conceptual	e.g., Semantic Model 	e.g., Business Process Model 	e.g., Logistics Network 	e.g., Workflow Model 	e.g., Master Schedule 	e.g., Business Plan 
SYSTEM MODEL Designer Logical	e.g., Logical Data Model 	e.g., Application Architecture 	e.g., Distributed System Architecture 	e.g., Human Interface Architecture 	e.g., Processing Structure 	e.g., Business Rule Model 
TECHNOLOGY CONSTRAINED MODEL Builder Physical	e.g., Physical Data Model 	e.g., System Design 	e.g., Technical Architecture 	e.g., Presentation Architecture 	e.g., Control Structure 	e.g., Rule Design 
DETAILED REPRESENTATIONS Subcontractor Out-of-context	e.g. Data Definition 	e.g., Programs 	e.g., Network Architecture 	e.g., Security Architecture 	e.g., Timing Definition 	e.g., Rule Specification 
FUNCTIONING ENTERPRISE	DATA Implementation	FUNCTION Implementation	NETWORK Implementation	ORGANIZATION Implementation	SCHEDULE Implementation	STRATEGY Implementation

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Federal Enterprise Architecture Framework (FEAF)

Senior IT managers of federal state, USA publish a federal enterprise architecture framework. The architecture includes instructions for information systems architects to describe multiple organizations missions of the government.

Federal enterprise architecture framework is a conceptual model to define an integral and documentary structure for professional management, design and development in the state. Also, it acts as a guidance to collect common information and a reference for data storage like other frameworks (Rezaeirad, 2014).

Treasury Enterprise Architecture Framework (TEAF)

In 2000, America Treasury defined the framework. It leading to reach the following objectives;

- Directing associated bodies and related sections to prepare information systems architecture
- Providing concepts, rules, technology, common and integral standards for treasury organizations to be established
- Preparing a standard framework to describe enterprise architecture

It is an ordered copy of FEAF architecture framework based on Zachman’s idea and support commercial processes. This framework tries to train commercial processes development and design to different groups in order to meet legislation requirements in a technology environment which is changing.

TEAF’s idea is division of sections to be individually used to diminish development complexities and using enterprise architecture. Therefore, EA is divided into work points of view and products. FEAF introduce a matrix and tends to provide a simple and consistent structure for enterprise architecture wholly. Four architectural views (task assigned, information, organizational and infrastructural) and the second four aspects of (planner, owner, designer and Builder) constitute FEAF matrix.

Table 2: Treasury enterprise framework matrix (Khayyami, 2009)

		Functional View	Information View	Organizational View	Infrastructure View	
Legislation & Directives Agency Policies Information Assurance Policy Strategic Plans Enterprise Requirements Enterprise Architecture Roadmap Enterprise Principles	Planner Perspective	Mission & Vision Statements	Information Dictionary	Organization Chart	Technical Reference Model Standards Profile	Enterprise Transition Strategy
	Owner Perspective	Activity Model Information Assurance Trust Model	Information Exchange Matrix (Conceptual)	Node Connectivity Description (Conceptual)	Information Assurance Risk Assessment System Interface Description Level 1	Forecasts
	Designer Perspective	Business Process/ System Function Matrix Event Trace Diagrams State Charts	Information Exchange Matrix (Logical) Data CRUD Matrices Logical Data Model	Node Connectivity Description (Logical)	System Interface Description Levels 2 & 3	
	Builder Perspective	System Functionality Description	Information Exchange Matrix (Physical) Physical Data Model	Node Connectivity Description (Physical)	System Interface Description Level 4 System Performance Parameters Matrix	
		Essential Work Products	Supporting Work Products	Other Resources		

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The Open Group Architecture Framework (TOGAF)

TOGAF is an architectural framework that provide a comprehensive approach to design, plan,, implement and manage information architecture of organization. Enterprise architecture is divided by TOGAF as follows;

- 1- Commercial architecture: it covers processes of which use in reaching their desired goals.
- 2- Applied plans architecture: how applied plans are designed and connect to each other.
- 3- Information architecture: how enterprise data storages are organized, it explains.
- 4- Technical architecture: it details hardware and software structures and support applied plans.

TOGAF is known as architecture development method (ADM) and use during the promotion. ADM process is cyclic with eight stages (architecture, business architecture, information systems architectures, technology architecture, opportunities and solutions, migration planning, implementation of e-government and architecture change management).

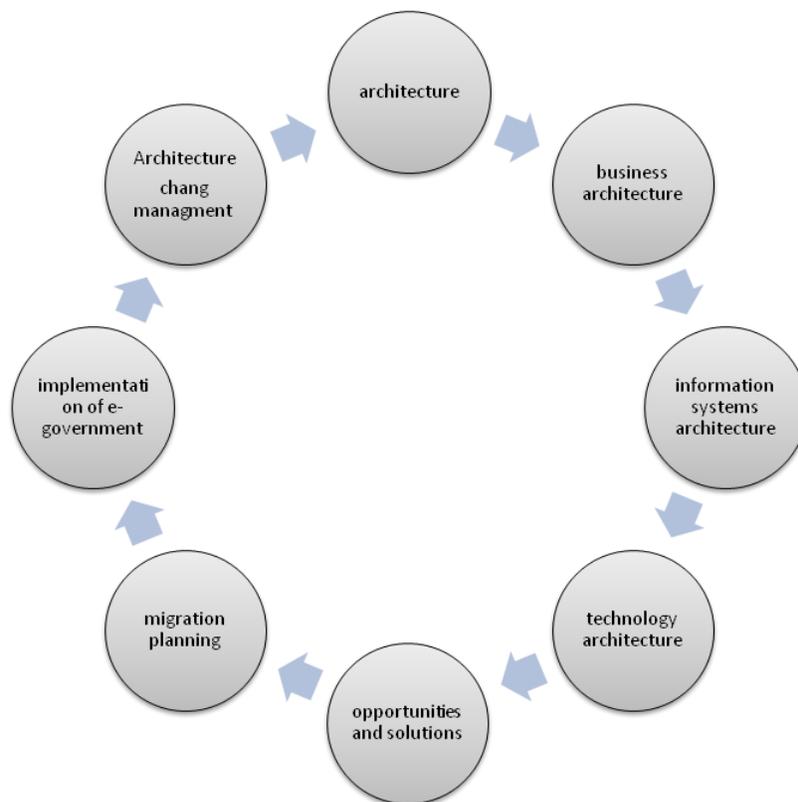


Figure 1: Structure of the TOGAF Architecture Development Method (ADM)

It is an advantage for TOGAF to integrate with archimate, a private and powerful enterprise modeling language and support from definition, analysis and imagination of enterprise architecture. Archimate language combines the new ideas towards services and provides required devises for support of enterprise architectures in relation with business areas to be explained, analyzed and imagined by a single method (Rezaeirad *et al.*, 2014).

Convergence of Enterprise Architecture towards E- government

It is possible to integrate architectures and prepare holding organizations architecture with enterprise architecture in its different areas. Since large enterprises must benefit from mission subset architecture so the method is useful for them of which the architecture is not practical in the first stage as a whole. In a considerable vision, if state organizations based on definite patterns provide enterprise architecture, national enterprise architecture and reference models including, “services and state systems

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“information”, “information technology and communications”, “national standards of information technology and communications” and etc. are built accordingly. In addition, it has been implemented in the America and consequently, most of information systems were substituted with common components in this country and enterprises will be more ready to reach a complete e- government.

E-government Development Challenges

There are many challenges for e-government development and they can be classified to several aspects; Coordination Challenges: Lack of integrity of applied plan in state organizations will result in diversity of storages because of any organization has a collection of data, management trends and specific projects (Vanka, 2007).

Ingenious Challenges: Nowadays, e-government should respond to environmental needs and being consistent with residents through other ways, mobile phone and cloud. E-government shall be able to manage changing residents’ needs, search progress factors in cloud technologies and how they take advantage (Ebrahim and Irani, 2005).

Cost Challenges: successful implementation is rarely common and need to make attempts. Moreover, reuse is a vital demand for mechanism while it helps to distinguish and define business processes and share by various state organizations in order to reduce costs and increase complex making (Cellary and Strykowski, 2009).

Presentation of an Ideal Enterprise Architecture Framework for E- Government Development Conformity with Challenges

Here, we evaluate eight criterion to select a framework of e- government development, they have also been selected in accordance with contents of e-government (Rezaeirad *et al.*, 2014).

1- Architecture Process: It shows basic stages for creation of an appropriate architecture and classification plan to move from current to future architecture. TOGAF is a complete and well known architecture process namely Architectural Development Method (ADM) while Zachman’s framework cannot define any process to build enterprise architecture.

2- Services Direction: Using results of service- oriented pattern in software units have been divided into functional abilities to dissolve individual problems. During the last decade, Service- oriented Architecture (SOA) has been paid attention by the governments due to increased profit of investment, organizational Ingenious and reaction ability. Although, the existing frameworks do not entirely cover principles of service- oriented design.

3- Cloud Empowerment: cloud computation is increasing in the state enterprises for its higher potential in optimal solutions, easy establishment in scope of budget sluggish and rapid changes. The organizations provide changing capital costs into implementation ones by the cloud. Support of cloud by new models of current framework is not still balance and need more progress.

4- Architectural Modeling: We consider limits, strength of tools and modeling techniques assigned for the framework. There are many modeling techniques and languages which are allocated by organizational architectural frameworks but are different in their limits and details. Already, TOGAF can receive archimate as an independent and free enterprise architecture modeling language and support its definition, analysis and imagination of architecture.

5- Evaluation & Supervision: ability to access to efficiency and perfection of various organizations in using enterprise architecture is provided or a supervision process expand Ingenious under continuous progresses to parallel IT investments of enterprise and business goals. FEAF focus on successful assessment in using enterprise architecture and introduce evaluation techniques to complete and use architecture.

6- Reference Models: These models can be regarded for enterprise architectural development for its reuse, share, learning experience and agreement in service level. It is so important for acceptance of cloud solutions. However, FEAF is better.

7- Complexity Management: In essence, complexity exists at any organization including, e- government. Therefore, complexity management plays a significant role to facilitate enterprise architecture. The

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subject was considered by FEAF and its views in enterprise architecture. Also, TEAF focus on reducing complexity by enterprise architecture subdivision using views, aspects and products.

8- Documentary: Enterprise architecture development documentary are important in respect of e-government of which policies and shareholders are permanently replaced. They should be paid attention to expand knowledge and experience.

Table 3: Evaluation of criteria in selection of a framework for e- government development

Criterion	ZEAF	TOGAF	FEAF	TEAF
Architecture process	Weak	Excellent	Good	Good
Services direction	Weak	Good	Good	Acceptable
Cloud empowerment	Weak	Acceptable	Acceptable	Weak
Architectural modeling	Acceptable	Excellent	Good	Acceptable
Evaluation & Supervision	Weak	Good	Excellent	Excellent
Reference models	Acceptable	Good	Excellent	Acceptable
Complexity management	Acceptable	Good	Excellent	Good
Documentary	Good	Good	Excellent	Good

With due consideration to the above table, TOGAF framework possesses the most suitable planning for e-government growth and development. Also, TOGAF and FEAF is so important in finding an optimal solution and increased productivity compared to other frameworks. TOGAF framework is more parallel with e- government, because it is empower to solve the problems and indicate advantages and disadvantages. FEAF and TEAF may cause to reduce errors under continuous supervision and improve development process. Using components optimally and diminishing costs of FEAF development is more desirable for e- government.

CONCLUSION

Discussion and Conclusion

Enterprise architecture for e- government development lead to facilitation of business activities. This paper has been conducted to focus on e-government challenges in addition to suitable framework conformity to the challenges. Although, FEAF framework is known as an ideal framework for e-government development but the framework cannot solely cover all aspects and needs. By the way, it a mixed framework can be presented to meet all dimensions and requirements.

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