

## An Architecture for IT Organization Structure in the Developing Countries

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**Abstract:** The executive & support structure and related roles are as a critical factor in the ICT management. Although the processes such as Enterprise architectures in the development of the IT indicates a set of specifications but they could offer no specific models for structural development in the whole organization. This article has focused its attention on giving architecture for the development of the IT organization structure with the approach of IT development in the developing countries and their common modalities in using IT. The presented architecture has been formed on the basis of the Enterprise Architecture frameworks and IT governance models which contains a set of specifications and requirements. After presenting the architecture and its details, with the aim of describing the applications of the above mentioned architecture, one model for IT structure will be recommended to Iranian government which is quiet suitable. This recommended model shows how to use the study architecture.

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**Key words:** Organization structure • IT Governance • Strategic alignment • Organization architecture

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### INTRODUCTION

The executive structure performs as an important factor in the achievement of goals, strategies and executive and support programs. In ICT management this factor is a key factor as well, but it has been seldom planed on the basis of development models and structure maturity. In the developing countries the IT management is as a responsibility for the chief information officers possessing a special legal position and enough reliability for decisions making [1]. The formation of these positions and roles has been on the basis of maturity models and there is well similarity among them and the applications of IT [2,3].

In the developing countries the technologies don't be used according to a maturity model and in many cases because of entering the sudden technologies without considering the other elements dealing with it such as the organization structures executing it, the prospective applications can't be provided. Relating to IT Governance models and considering the management and executive structure which plays key role there [4-6], having enough reliability for strategic decisions remarkably impact on IT alignment and organization strategies. As a result, the definition of the necessary structures for management and governance it as a set of frameworks and models besides IT technological deployment models is of great importance [7].

The keynote of this study is to present a model for deployment of the IT organization structure in different institutions. This model indicated as a four layers architecture have a direct and important impact on the development of IT structure with Enterprise architecture approach and considering to IT Governance areas.

**The Developing Countries:** Several factors existing in the developing countries create obstacles in deployment and proper use of IT. For example there is not a basic structure for IT and also there is not a proper similarity between IT position and its role in the organizations [8]. In this countries the use of IT applications are faster than its management processes, hence, their expectations are not fully achieved [9]. Regarding the processes and the maturity models of the information management and IT, the aim of IT application is always creating value and the most critical effort is to create the necessary alignment among the business strategies and IT and for achieving this goal the executive structure should have enough authority to be useful in enormous decision making and fulfilling them. In this article the word Enterprise means any organization structure in business area and it will be meaningful in the area of the whole government to the internal part of the organizations.

**Enterprise Architecture:** Enterprise Architecture is a description of the total system and indicates the elements

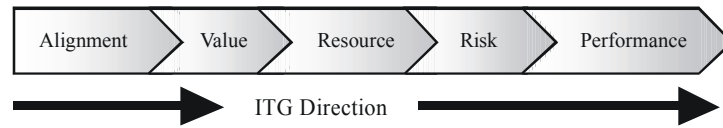


Fig. 1: Areas IT Governance

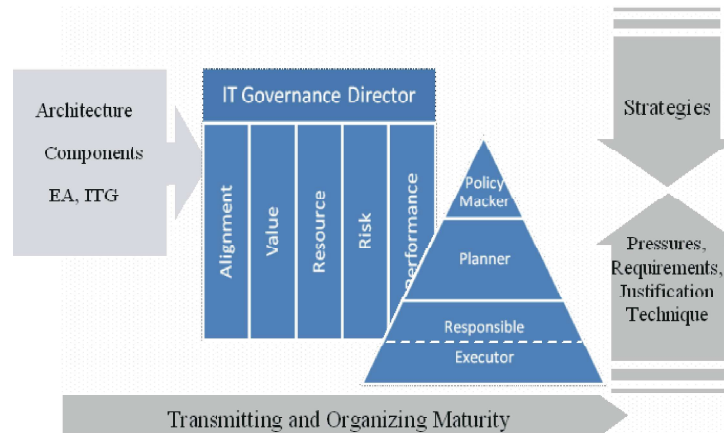


Fig. 2: Article Architecture

structure and the system components, the relationship among them and also the required items for planning and achieving the components [10]. One of the architecture components is the Enterprise structure with its dominated relations and its conditions indicated within architecture frameworks, therefore the principles, attitudes and the results mentioned in the Enterprise architecture ensure the success of the indicated architecture in this study.

**IT Governance:** IT Governance is a management models which has significant impact on management and has motivated enterprises to use it increasingly. IT Governance is a process that exploit IT strategies to make IT processes and by using necessary resources, fulfilling of the responsibilities would be possible [11]. Successful enterprises realize the risks and the benefits of IT and find ways to achieve their goals and aligning IT strategies with business strategies.

IT Governance has 5 major areas (shown in Fig. 1) which make it conspicuous [8].

Applying IT Governance principles to determine the roles, responsibilities and their relations seems to be one of its distinctions, therefore in this article it is considered as the base of designing the roles and responsibilities [12].

**Strategic Alignment:** The purpose of the IT strategic alignment is to establish a balance between IT operations and organization operations. Making and promoting IT

strategic role at the senior IT management level is one of the key factors in achieving such an alignment in the organizations. These chief officers also possess sufficient legal authority at the enterprise level besides IT expertise and management knowledge.

**Value Delivery:** The value should be improved in 3 areas: Time, expense and quality. By creating value the expectations of the organization will be fulfilled through a common language between IT and the related organization which is set by officers and services providers.

**Risk Management:** Risk management is the process of identifying risk, assessing risk and taking steps to reduce risk to an acceptable level. Any organizations and any level of the services or products involve the identification of the risks and should be managed.

**Resource Management:** Resources include people, applications, technologies, facilities and data. In this category, the necessary roles for optimizing knowledge and essential infrastructures must be defined and responsibilities have to be identified.

**Performance Measurement:** By giving new solutions, IT can help to reinforce a set of objectives in different fields like financial, customer, process and learning using technical measurements such as scorecard. It can be used in Performance measurement.

Table 1: Mapping the literature of EA and article Architecture

Define in research Architecture	Define in EA
Policy maker	IT Governance
Planner	Strategic management
Responsible	Executive Management
Executor	

Table 2: Responsibilities in each layer of the architecture

Org. Levels	Governance Areas				
	Strategic Alignment	Value Delivery	Resource mng.	Risk mng.	Performance mng.
Policy Maker: Oversee in achieving strategies	<ul style="list-style-type: none"> <li>Strategic Planning and stating Policies</li> <li>Aligning between government/IT development plans</li> <li>Measuring achieving strategies</li> <li>Policy making for using Technology</li> </ul>	<ul style="list-style-type: none"> <li>Assuring that the IT delivers are effective</li> <li>Supporting IT investments considering risk and benefit and acceptable budgeting</li> </ul>	<ul style="list-style-type: none"> <li>Ensuring a proper balance of IT investments for sustaining and growing the enterprise</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate the effectiveness of management's monitoring of IT risks</li> <li>Determine Monitoring Framework related to "IT Master Services Framework"</li> </ul>	<ul style="list-style-type: none"> <li>Assessing performance on IT strategies in operation</li> <li>Evaluate requirement and Provide corrective actions</li> </ul>
Planner: Oversee in executive	<ul style="list-style-type: none"> <li>Ensuring the existence of the proper IT organizational structure and complements the business model and direction</li> <li>Alignment between embraced organization and IT</li> <li>The definition of the priority and supervision on the perspective of the relation between the IT development and the organization</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that there is Management Knowledge in order to have expected impact</li> <li>Studying Business/IT Architecture and supervision on exploitation of IT by organizations</li> <li>Reviewing, improving and investing in initial procedures and supervision on it,</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring on determining IT resources</li> <li>Ensure the organization is in the best position to capitalize on its information and knowledge</li> </ul>	<ul style="list-style-type: none"> <li>Be aware about IT risk exposures and their containment</li> <li>Ascertain that management has resources in place to ensure proper management of IT risks</li> </ul>	<ul style="list-style-type: none"> <li>Work with the executive to define and monitor high-level IT performance</li> <li>Define guidelines for Plans successful.</li> </ul>
Responsible	<ul style="list-style-type: none"> <li>The alignment between IT operations and business operation</li> </ul>	<ul style="list-style-type: none"> <li>Studying the exploitation of IT services and products by the organization</li> <li>Assess and publish operational benefits of owned IT investments</li> </ul>	<ul style="list-style-type: none"> <li>Allocate business resources required</li> <li>To ensure effective IT governance over projects and operations</li> </ul>	<ul style="list-style-type: none"> <li>Adopt a risk, control and governance framework</li> </ul>	<ul style="list-style-type: none"> <li>Obtain assurance of the performance, control and risks of IT and independent comfort about</li> </ul>
Executor	<ul style="list-style-type: none"> <li>Confirming the above technical plan is usable in organization level</li> </ul>	<ul style="list-style-type: none"> <li>Provide Technical Plan and execute based on requirement</li> </ul>	<ul style="list-style-type: none"> <li>Ensure resource plan is provided and executed.</li> </ul>	<ul style="list-style-type: none"> <li>Provide Risk mng. Plan for running projects</li> </ul>	<ul style="list-style-type: none"> <li>Deploy technical standards</li> </ul>

Since this article emphasizes on IT enterprise structure, it applies the areas and other principles of IT in the enterprise structure and definition of roles and responsibilities.

**Describing Article Architecture:** The proposed architecture is designed according to the enterprise architecture approach and with considering IT Governance principles (Figure 2). Different aspects of this architecture are explained in the following.

**Conformity with the Concept of IT Governance:** IT Governance areas have been considered in defining the roles (shown in Fig. 2). IT Governance Areas includes definition principles of the roles and the responsibilities of each layer in above architecture (shown in Table 2).

**Conformity with Enterprise Architecture Framework:** Federal Architecture Framework has offered 4 major layers displayed in Figure 3:

The 3 roles namely IT Governance, Strategic management and Executive Management and their mapping with architecture layers demonstrate the

functional expected from the proposed architecture. The above subjects are explained in the following table compatible with enterprise structure. Note that it is not changing the roles. Further, the executive management is segregated into Responsible and Executor due to the flexibility of defining the roles and their responsibilities. Also, it concerns the actual situation of organizations in developing countries like Iran.

**Architecture Layers:** As demonstrated in Table1 and Figure 3, the proposed architecture is 4-layer architecture.

There are 4 types of organizations defined in this architecture. Each one has its proper roles and responsibilities as follows:

**Policy Maker Layer:** This organization sets the policies for embracing organizations. The result of their decisions impacts on IT. These Decisions apply IT in organization and business.

**Planner Layer:** This organization plans and monitors the execution of IT development plans in accordance with the policy makers' tactics and policies in their business boundary.

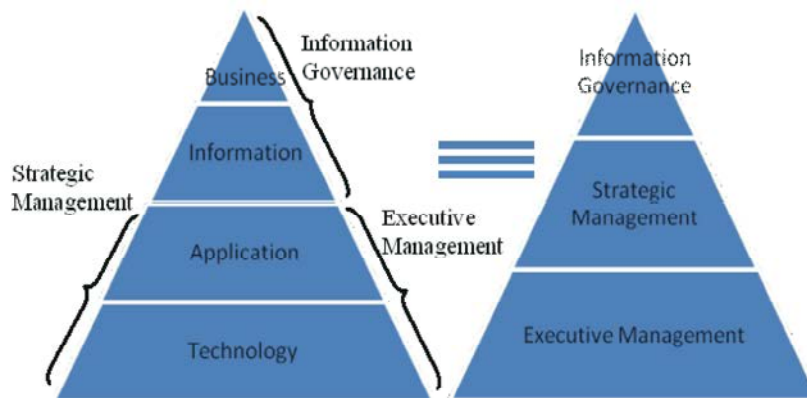


Fig. 3: Mapping with Enterprise Architecture and Management roles

**Responsible Layer:** This organization is regarded in a specific part of business as a responsible or beneficiary for the execution of a plan, program or a project.

**Executor:** These Enterprises are placed in the last layer and perform as the executors of the plans and projects. They can provide or offer services/products either inside the responsible enterprises or as cooperated organizations or contractors.

Since using outsourcing and proper resources is one of the IT Governance recommendations, in order to settle IT guideline between service providers and customers, communication models are used in IT governance outsourcing [13-15].

**Architecture Components:** Architecture Components are elements that regarding them leads to deployment of IT in the organization and a balance among architecture layers. Considering the conformity of the model with information organizational architecture framework and also considering IT governance areas, all of their mentioned components are applied in this architecture as well. These components include legal drivers, functional requirement, position in organization, tools, technology, geographical distribution and so on.

**Maturity Direction:** The architecture accents that the organizations must move toward maturity. In this architecture, maturity definition is based on IT governance principles. Maturity within structure includes creating a balance among layers, achieving the goals and the requirements of the architecture, expanding its components and lastly creating internal structure of IT. Definition of roles and responsibilities is based on ascertaining the maturity level.

**Bi-Directional:** I must point that the above architecture is a Bi-directional model. It means that the upper layers represent master strategic to the organizations in the lower layers thereby forming master plans. Regarding these master plans, functional and executive plans are also formed and proceed for their implementation.

On the other side, by participation the lower layers to sustain decision-makings on business, a set of recommendations, needs, challenges and technical justification are declared that supports formation of guidelines and plans. This is a significant issue for setting the communications in the architecture.

**Architecture Specifications:** There are several principal specifications in this architecture explained in brief:

**Conformity with the Enterprise Architecture Frameworks:** These frameworks verify the necessity of the organizational structure and consider the principles and components of Enterprise Architectures.

**Conformity with the IT Governance:** The priority of this architecture in proposing the roles is because of the importance of IT Governance in IT management and its proposed areas.

**Role-Basis:** The proposed structure of the above architecture is the Role-basis and an organization might be placed in different layers, depending on its role. It makes the architecture to be flexible.

**Relationships on the Base of Roles:** Structural correspondence and communications among organizations and their units are reached through defined roles in the model.

Table 3: Comparing objective code functions with problems related to the country IT structure:

Problems	Code functions
Middle position for strategic Roles	RA1-RA2-RA3
Oversight to Organization Maturity	RR-RM-RA2
Non-interrelated Decision makers	RV2-RR1-RP2-RP1
Unclear IT Position	RA-RP
Ignoring IT Strategic role in Organization	RA-RV1
Use of non-suitable technology	RA2-RA3-RM-RV3
Slow development in IT deployment	RP-RR-RM-RV
Strategic Planning without considering IT Structure	RA2-RV2-RM2-RR2-RP2
Insufficient skill	RM-RP-RV3
Having no relationship with contractor	RA2-RV2-RM2-RR2-RP2-RM3-RA3
Low Capability of IT unit for aligning with business	RA-RP-RV-RM

Table 4: Functions code of the architecture layers

Org. Levels	Governance Areas				
	Strategic Alignment	Value Delivery	Resource mng.	Risk mng.	Performance mng.
Policy maker	RA1	RV1	RM1	RR1	RP1
Planner	RA2	RV2	RM2	RR2	RP2
Responsible	RA3	RV3	RM3	RR3	RP3
Executor	RA4	RV4	RM4	RR4	RP4

**No Need for an Identical Structure:** This model represents the primary requirements for the organizations internal structures. Though; there is no need for an identical structure. However, attending architecture principals is important.

**Application in Each Enterprise:** Enterprises vary from the top level organization to the unit level. Each one can extract its related usage from the architecture.

**Roles and Responsibilities:** Each layer of the architecture, organizations have some responsibilities that provide relationship, roles, Strategic Direction and their execution.

This architecture determines three roles, Planning, executing and assessment according to the IT governance. Planning is an effort for Business/IT alignment, executing consists of monitoring and controlling resources, IT management and risks and assessment consists of investigating the benefits, occasions, expenses and risks [16]. The Table 2 shows the key responsible.

As shown in Table 2, each layer is responsible for organizing and balancing the lower layer.

**A Case Study of Article Architecture - the Proposed Structure for IT Structure IN IRAN:** In the following, In order to align the suggested structure with governmental organizations of Iran, the IT structure for government of Iran is presented. The objective of the

alignment is a case study of article architecture. Similar to the architecture explained above, this structure is Role-Base and organizations can be placed in different layers according to their roles. The organizations mentioned in this structure are existent and active, but their relationships are not properly defined and there is often repetition during fulfilling the plans and the projects. This model can resolves some problems and also help in the direction of the maturity and governance of IT.

**Architecture Usage Advantages:** Some problems related to the IT organizations structure in Iran are mentioned in Table 3. Comparing the key roles defined for this architecture and these problems proves that implementing this structure and its necessities can achieve the requirements.

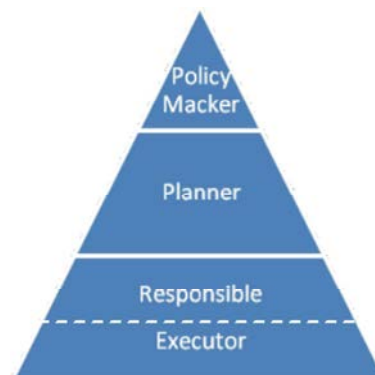


Fig. 3: Architecture Layers with Article Literature

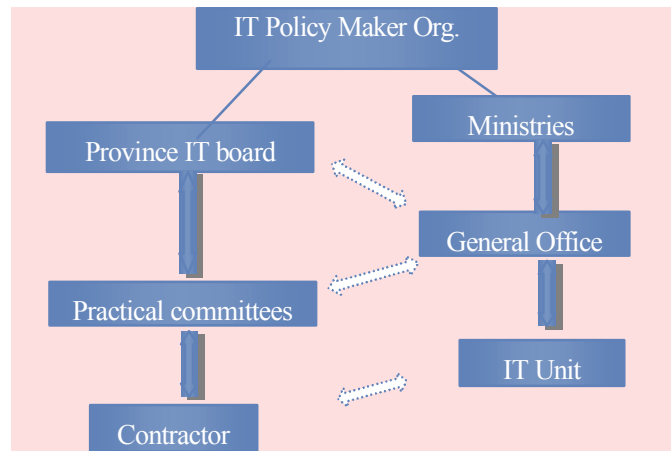


Fig. 4: purposed IT structure for IRAN

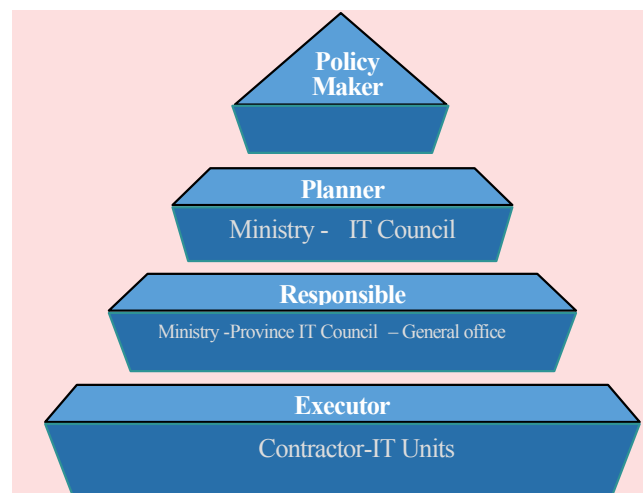


Fig. 5: Mapping IT Structure in Architecture Layers

Table5: Mission of organizations in the proposed IT structure IN IRAN according to the article architecture

Type	Mission of Organizations
Policy maker	Policy maker organization: makes policy and defines master strategies in IT domain, defines short/long time plans to develop basic and application researches in IT and to extend the utilization of information and communication technology inside the country and defines development plans.
Planner	Ministry: Implementing decisions of policy makers has adopted and promulgated to the authorities for taking necessary actions. Province IT council: Implementing the decisions at executive level of which the policy makers has adopted, into the high level scope of province and ensures taking balance between province organizations according to the their tasks, which have been cited in policy, as well as initiating priorities, investments, etc.
Responsible	Ministry: Performs strategic plan at organization level. To keep integrity and balance between interdisciplinary bodies of an embracing organization and manage the processes they have been made in accordance to strategic plan, is their major responsibility. Province IT Council: responsible to perform action when a solitary position of the IT Council mandates to take necessary steps by its own. Province General offices: Planning for the execution and exploitation of technical, practical projects at organization level. They practicing programs that the superior organizations have been signed and is compatible with Province IT council platform.
Executor	These organizations which could be governmental or non-governmental, real or legal execute and support the execution of projects. They might be either a part of the organization or a contractor.

**Structure Introduction:** The structure of IT in Iran defined according to the article architecture is presented in Figure 4. It consists of the top level of a policy maker who identifies the strategies and programs at the government level.

Also, another organization is needed to monitor the executions and create a balance relationship across planners and responsible organizations. Furthermore, it ought to be able to make decisions and plans for some ultra-domain applications. Province IT board is accordingly offered, which contains practical committees embracing organization's agents. This issue is presented in accordance with the country status and previous endeavors to organize the IT execution structure in the Government of IRAN.

According to Figure 4, this organization fits in the first layer of the proposed architecture. Therefore, all of the responsibilities determined for the layer are consequently assumed for the organization.

The roles of the other organizations existing in the structure are displayed in Table 5. The position of the proposed structure in the layers of the article architecture is shown in Figure 5.

**Roles and Responsibilities:** As seen in Figure 5, based on the definition of the architecture layers, the organizations possess different roles which determine their proper position among the layers. These organizations are intended for all of the necessities and roles explained in article architecture.

## CONCLUSION

Organizational structures are considered as appropriate support issues in business/IT alignment and must improve compatibly with other technology applications in the organization. In IT management models like Enterprise Architecture, IT master plan, IT governance and etc. needs for a support structure for running programs and fulfilling the goals are inevitably explained. Practically because of some reasons such as legal frameworks and self-interested designing, choosing such a structure is incompatible with the maturity of the organization and does not have the suitable authority in decision-makings.

The significance of taking into account the "structure" particularly in incorporating with IT Management Methodologies and Models is deduced from the article architecture consequences and its implementation in Iran.

This makes the roles and responsibility more comprehensive and protects essential communications. Based on IT governance models, the risk management and performance measurement are the key factors in creating the value inside the organizations. Enterprise structures certainly need to develop and move toward the maturity and thus presenting a similar structure for the all organizations is impossible. The maturity must be proportional with the applications of IT at the organization level.

The case study offered here demonstrated that it does not seem essential to have fundamental changes in the present As-Is structures and describing and changing the roles and positions holding decision-making authority in IT domain, can lead to a sufficient condition for creating the goals and plans in informational technologies domain.

**Future Research:** The position and the roles of the information chief officers should be identified inside the organizations mentioned in the research. Technical documents necessary for use and support have to be presented too. In addition to IT governance enterprise structure issue inspected here, other aspects and components of it should be under investigations, with the purpose of practical application, which influence the areas of the method in all aspects of the organization.

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