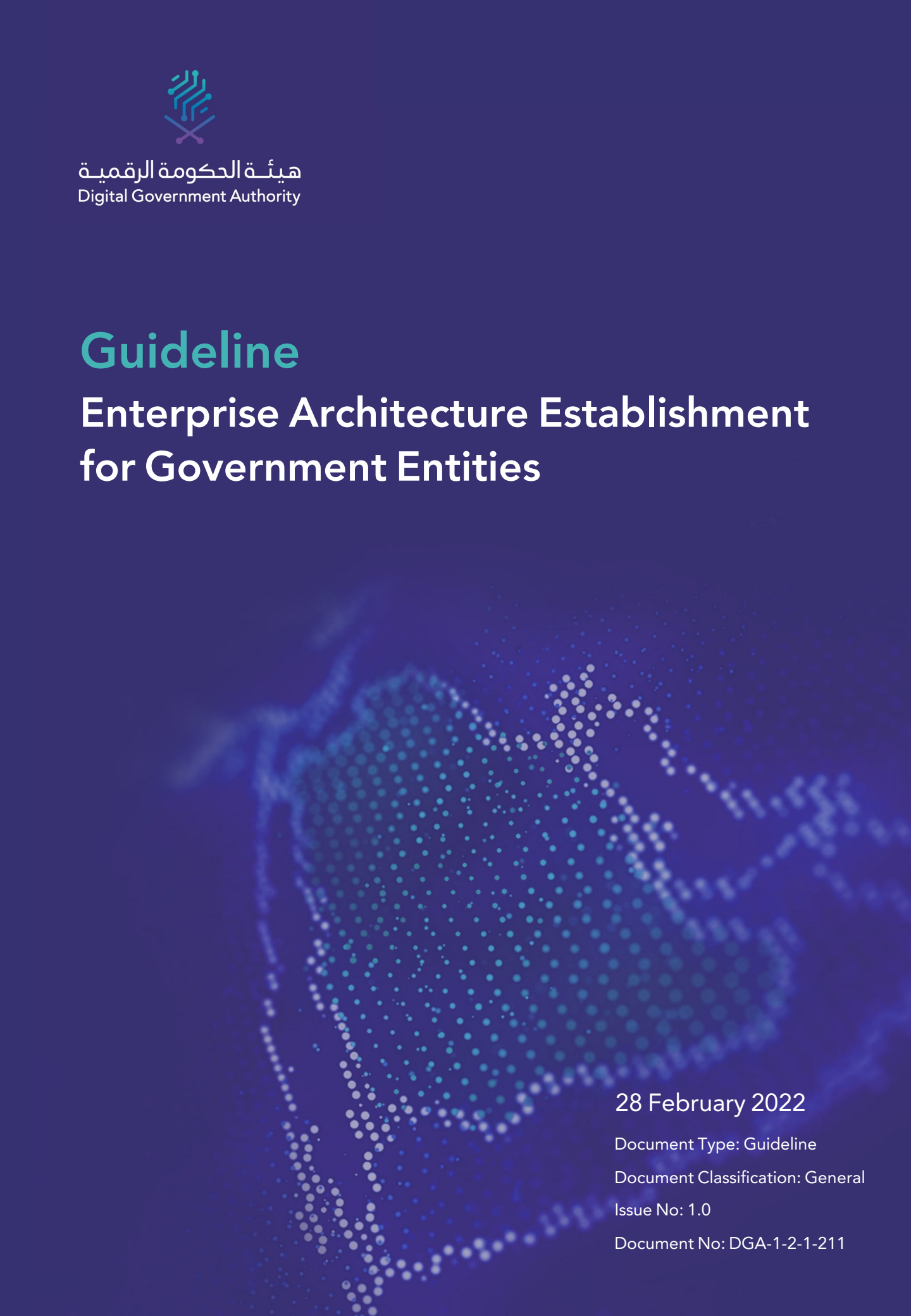
هيئة الحكومة الرقمية
Digital Government Authority

Guideline

Enterprise Architecture Establishment for Government Entities



28 February 2022

Document Type: Guideline

Document Classification: General

Issue No: 1.0

Document No: DGA-1-2-1-211

Contents

List of Figures

List of Tables

01. Introduction

Based on the responsibility of the Digital Government Authority in guiding government entities to apply international best practices in various areas related to digital government, the Authority developed a guideline for establishing the National Enterprise Architecture in government entities, Taking into consideration the regulatory framework for digital government business, which is a regulatory Instrument developed based on international best practices, to unify the concept of Government digital policies, standards, and guidelines, institutionalizing them, and guiding government entities through the process of their implementation. This guideline is considered one of the supporting mechanisms that will contribute to increasing the adoption and usage of enterprise architecture concepts and services to enable and support digital transformation activities in government entities.

02. Guideline Purpose

The purpose of this guideline is:

- Describe the basics and concepts of EA related to establish and implement EA in government entities.
- Demonstrate the benefits from EA capabilities to develop the digital transformation roadmaps and effectively support the enterprise vision, strategic objectives and initiatives.
- Support government entities to establish and operate the EA office. In addition, continuously improve the EA practice.

03. Target Audience

CxO's (Decision Makers in Government Entities)

- Overview of EA services and interactions with other enterprise functions to maximize the value of EA.
- Understand the organizational capabilities, weaknesses, strengths, challenges and improvement opportunities by EA implementation.

Enterprise Architecture Team (Business/Application/Data/Technology experts)

- Understand the basics of EA implementation and operation.
- Update and govern the EA components to ensure the alignment, data accuracy and unifying the sources.

04. Enterprise Architecture

4.1 Enterprise Architecture Definition

EA is a practice and a discipline for studying the current state of a government entity and creating a roadmap for transition to the target architecture to achieve alignment between the business (services and processes), information technology (data, applications, and infrastructure) and strategic objectives of the government entity.

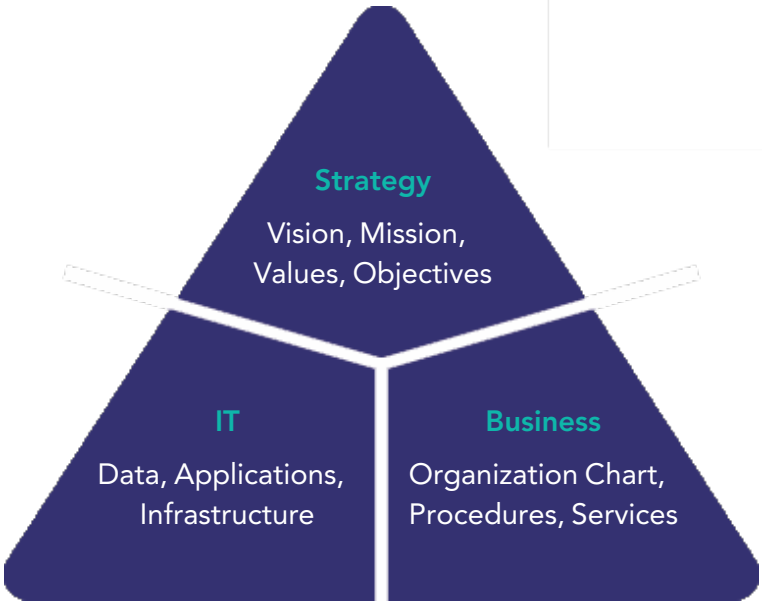


Figure 1 Enterprise architecture's components

4.2 Enterprise Architecture Business Values

The EA has an important role in supporting and accelerating digital transformation for government entities throughout:

- Preparing a roadmap and comprehensive initiatives for enabling government entities to build capabilities and resolve the gaps in all EA domains (business, data, applications, and technology).
- Achieving the alignment and effectively integration between business and IT to achieve the entity's vision and strategic objectives.
- Enabling government entities to introduce an effective governance capability by establishing architectural standards and processes.
- Defining EA principles and standards to optimize government entities' business processes, applications systems, data, and technologies.
- Ensuring the best utilization of government entity resources by identifying and enhancing services, applications, and technical components that are reusable or shared and avoiding duplication.

Thus, government entities should determine the most crucial drivers for developing their own EA. The following table lists the common drivers and the corresponding values to develop EA.

Drivers	EA Values
Unexciting governance framework to manage and execute a digital transformation plan	Govern the digital transformation plan from a comprehensive organizational perspective
Difficulty to identify the strategic and operational needs	Define strategic and operational needs based on gap analysis and prepare transition plan
Duplication and suboptimal use of resources	Raising the efficiency of spending and investment in information technology and avoiding duplication and repetition in technical projects
Weakness and inefficiency in service delivery	Improve the quality of existing services or products that the government entities provide to the beneficiaries
Weakness of integration and alignment between business and information technology	Achieving integration and interoperability at the entity level by providing a description of the entity's EA and identifying gaps to be solved

Table 1 Enterprise Architecture's drivers and values

4.3 Enterprise Architecture Implementation

4.3.1 Overview

The journey of EA begins at the preparation stage, which include defining the vision, objectives, requirements and drivers of EA in the government entity. In the second stage, it should define the Framework and Metamodel of EA. In the third stage, ensure the current architecture (as-is) has been studied and described to develop the target architecture (to-be) based on analyzing the gap. In the last stage, a transformation plan should be built to achieve the strategic objectives of the government entity.

Figure 2 Enterprise Architecture implementation phases

4.3.2 Preparation of Enterprise Architecture Implementation

Current architecture analysis

During this phase, the government entity should study the requirements and analyze in detail the current architecture for both business and IT. It should also identify main challenges, stakeholder needs, perform a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats), and conduct benchmarking studies. Based on the output of this phase EA scope and objectives should be defined.

EA requirements and objective

EA objectives and requirements should be defined based on stakeholders' needs, and current architecture analysis of business and information technology and trends. The figure below describes the EA objectives, requirements and effective factors to be determined.

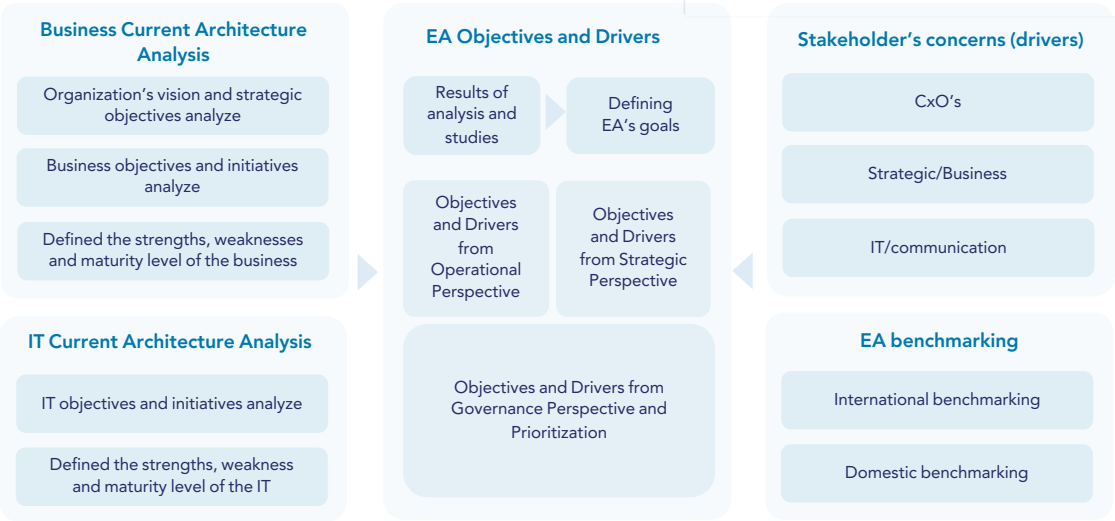


Figure 3 Enterprise Architecture objectives and requirements

Objectives from Strategic Perspective

The government entity defines the strategic objectives of the EA and aligns them with the entity's strategy

Objectives from Operational Perspective

The government entity defines the operational objectives of the EA and the KPIs.

Objectives from Governance Perspective and Prioritization

The government entity determines the principles of the EA, describes the objectives related to governance, and raises the efficiency of government resources.

4.3.3 The Framework and Meta-Model

The EA Framework describes the areas of the EA by providing a set of principles, models, standards, and KPIs' metrics related to the EA. It aims to organize the activity of the EA and provide a comprehensive perspective on the EA's areas according to government entities' needs. The Meta Model should be defined to describe the elements of the EA and the relationships between them in detail.

There are different types of EA frameworks, such as Zachman, FEAF (Federal EA Framework) and TOGAF (The Open Group Architecture Framework). However, the DGA has developed NORA (National Overall Reference Architecture) (Fig. 4) based on the best international practices and experiences as a general framework and methodology to raise the adoption of EA in government entities and to ensure the quality of implementation and use of EA.

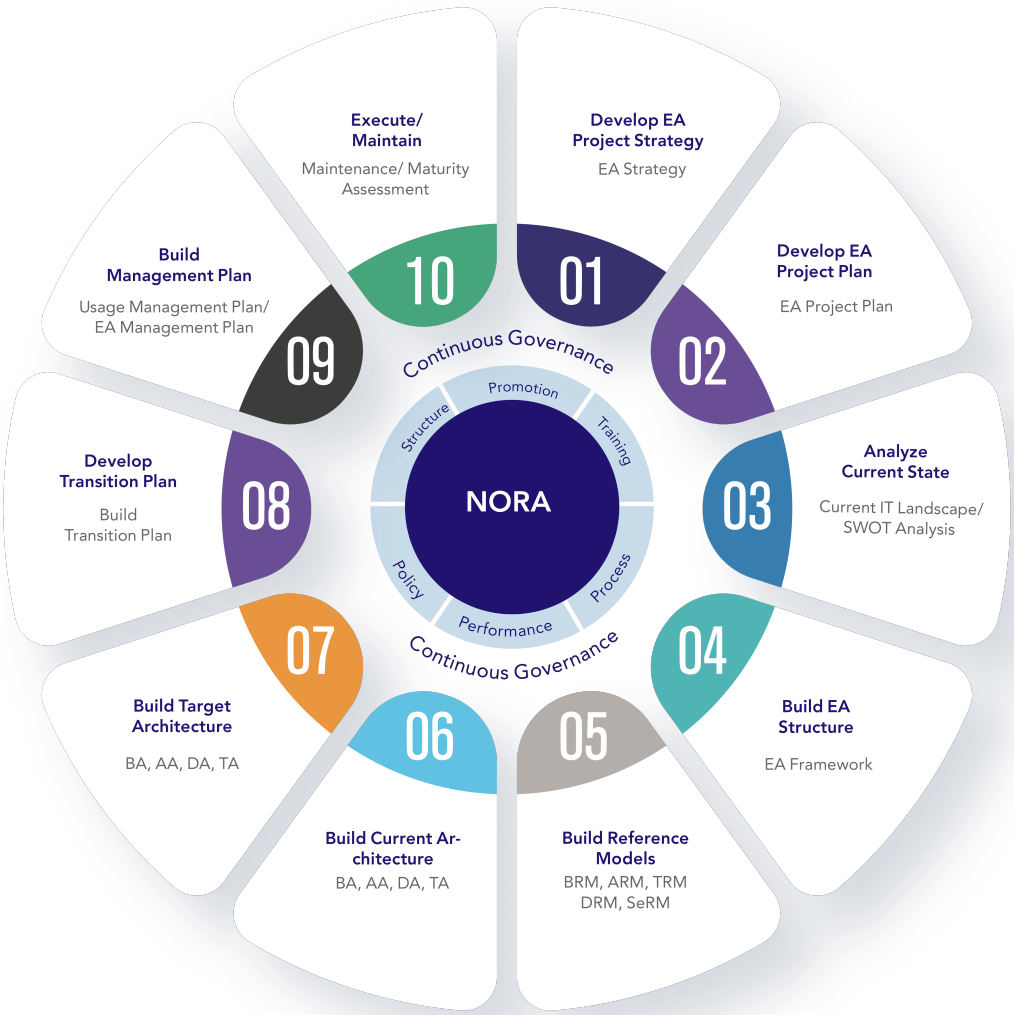


Figure 4 NORA Methodology

4.3.4 Architecture (Current, Target and gap analysis)

Documenting and analyzing the Current Enterprise Architecture (As-is)

It focuses on documenting and analyzing the current architecture based on EA framework and EA Meta Model, so that the government entity has develop a comprehensive blueprint for business and information technology aligned with the strategic goals, as well as identifying challenges and opportunities related to the EA's areas (business, data, applications and technology).

The below table displays some examples of EA's elements in defined areas.

Architectures	Data Sources
Business Architecture	1. Organization chart 2. Roles and functional descriptions 3. List of business processes 4. Service catalogue
Application Architecture	1. Application systems catalogue 2. List of application functions
Data Architecture	1. Database management system (DBMS) for all databases 2. Database diagrams 3. List of data exchanges (external and internal) 4. Data model 5. Database catalogue 6. Data flow diagrams
Technology Architecture	1. Hardware catalogue 2. Software catalogue 3. Software license agreements 4. Network architecture diagrams 5. Data center diagrams 6. Storage information (including backup)

Table 2 Data Sources for Current Architecture

Target Architecture Development (To-be)

The target architecture is built and developed according to the results of strategic analysis (opportunities, challenges, stakeholder needs, etc.), trends, best practices, analysis of the current architecture, and related national strategies.

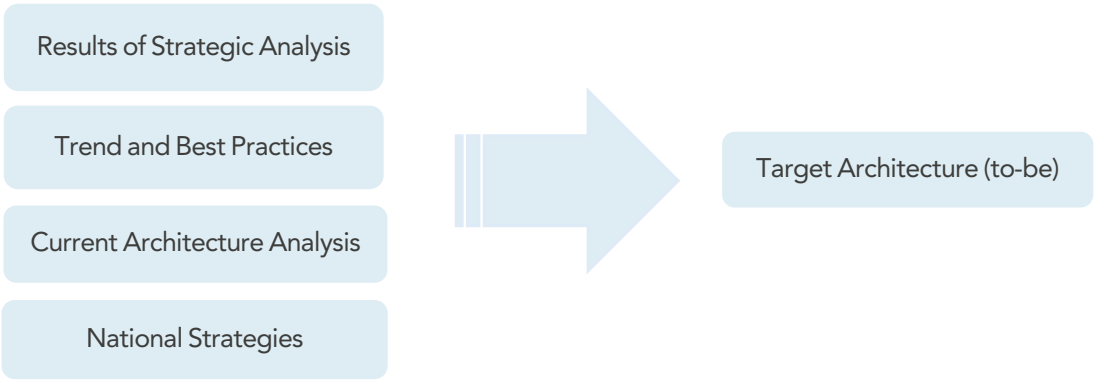


Figure 5 Inputs for Target Architecture Development

GAP analysis

The Gap analysis is a mechanism to compare the current architecture with the target architecture on all EA areas (business, applications, data and technologies) to identify deficiencies in order to build organization capability and solved the gaps

4.3.5 Transformation plan

Based on the gap analysis, a transformation plan is prepared, which includes the initiatives and projects needed to reach the target architecture, and raise the level of EA capabilities in the government entity. During the preparation of the transformation plan, initiatives are prioritized according to specific criteria based on the entity's strategic objectives to initiate priority projects and accelerate the implementation of the transformation plan.

4.4 Enterprise Architecture Operation

4.4.1 Overview

The purpose of this section is to describe the structure, mandate, services, roles, and responsibilities of the EA office. It also describes the communication between EA Office and other departments within government entity.

4.4.2 The Enterprise Architecture Office

The EA Office structure

The EA Office has an important role in implementing the government entity's strategy and achieving the target architecture through the transformation roadmap. In order to enable the office to carry out its roles effectively, the structure of EA Office is built and positioned in the organizational structure based on the direction and requirements of the government entity.

The following figure presents a suggested structure of the EA:

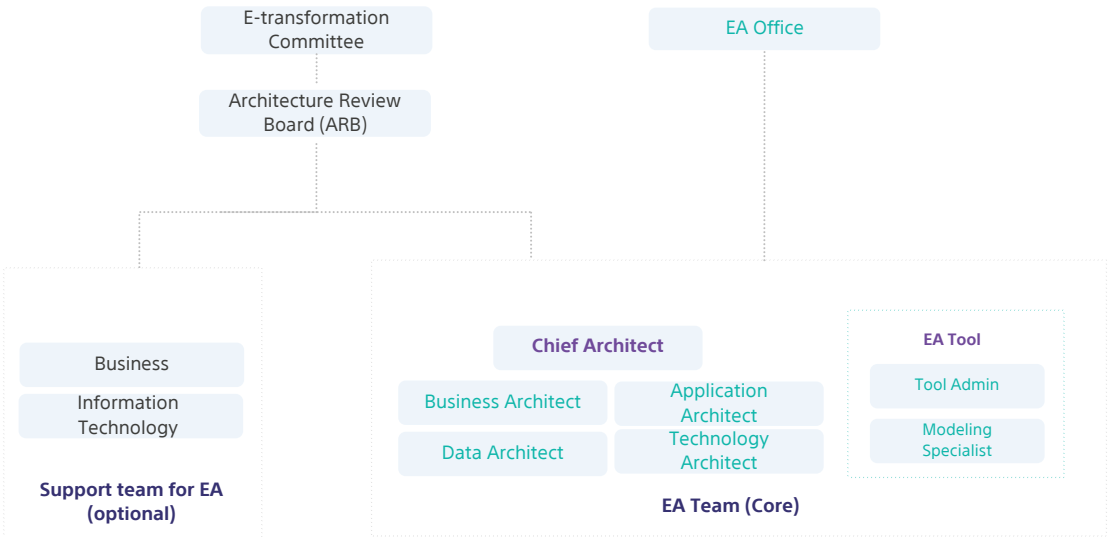


Figure 6 Enterprise Architecture Office's Structure

Based on the structure, the office team is divided into two blocks – core and optional. The core block consists of Chief Architect, Chiefs of all EA areas and EA Tool Administrator, while the optional block consists of Business and IT representatives to support EA business. The office's business and deliverables are governed by EA governance committees and e-transactions committee.

It's recommended that the EA Office should be positioned on the business side (Strategic Planning/Governance etc.) in order to enable the office to serve all entity's sectors

EA Office Mandates and Services

In order to maximize the value from EA implementation, The EA Office should provide the following core services:

EA Services	Description
Strategy Alignment	Providing general directions and necessary guidance to align between IT, Business and the strategy of the government entity effectively.
Documenting and Updating EA components	Develop and update the current architecture (As-Is) and the target architecture (To-Be) based on the strategic vision and stakeholders' needs in the government entity. Manage the enterprise architecture tool, which contains all the architecture data with the deliverables and reports.
Preparing and following up the implementation of the transformation plan	Developing the digital transformation roadmap, based on the gap analysis between As-Is and To-Be architecture. The roadmap describes initiatives required to reach the To-Be architecture, their priorities, time schedules and required resources.
Decision support	EA provides decision makers with a clear and comprehensive blueprint of the entity from different perspectives, which support in evaluating the entity efficiency (e.g., services, processes, systems, infrastructure and resources) and taking necessary actions accordingly.
Compliance with EA standards and principles	Ensure the implementation of the target architecture in accordance with the principles, policies and standards defined for the EA in order to raise the level of the capabilities and ensure the achievement of the strategic vision.
Project/Solution Support	EA supports projects and solutions by providing integral information and assessment across all architectural layers, which help in analyzing their impact, risks, compliance, and benefits.
Governance of digital investments Support	Review the digital initiatives and projects to avoid duplication and ensure the technical requirements meet the standards and principles of EA. In addition to reuse resources in optimal way in order to increase spending efficiency.
Awareness of EA	Increase the awareness of EA importance across the government entities through communication channels, and training.

Relationship and interaction with other sectors

It is necessary to enable and facilitate communication and identify the relationship and interaction between EA Office and other departments in a government entity, in order to enable the EA Office to achieve its goals. The figure and the explanation below show the relationship and roles between them:

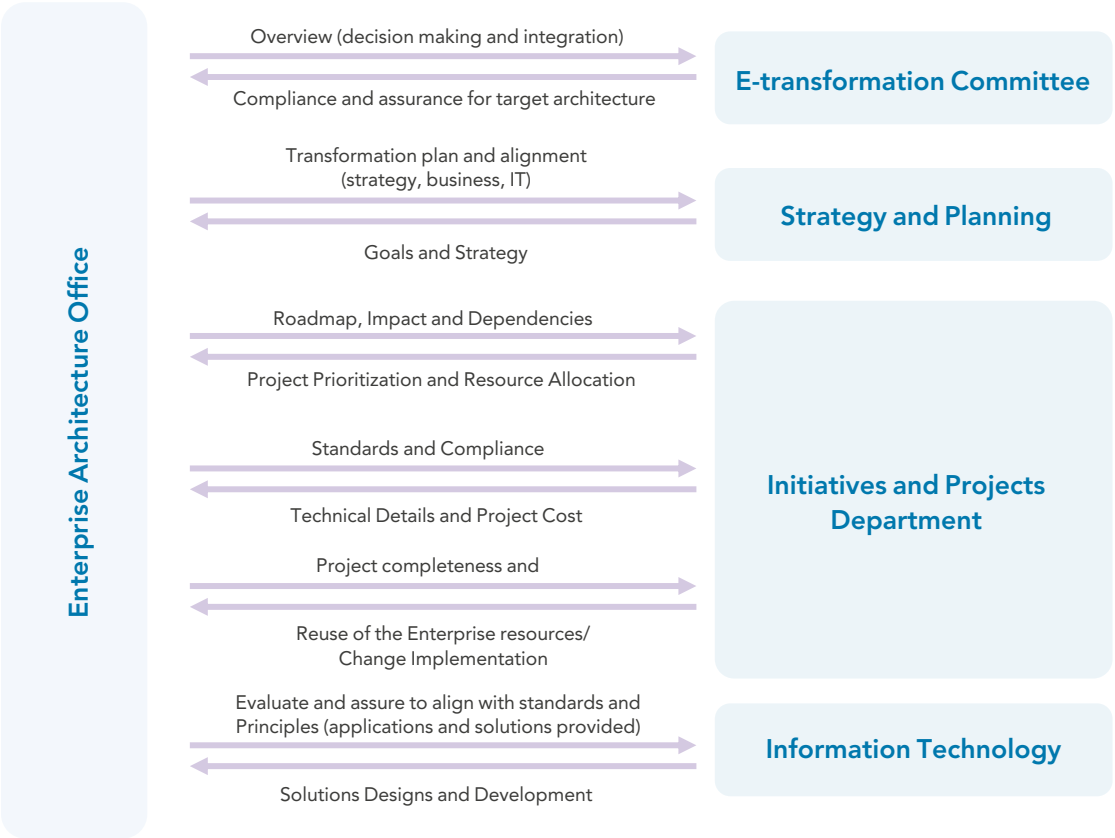


Figure 7 Relationship and Interaction with Other Sectors

Note: Please note that the interaction model presented in above figure only depicts the common core departments in a government entity. The model may different from entity to another based on their needs and organizational structure.

A. E-Transformation Committee

The E-Transformation Committee is the governance board that directs the practice and efforts of the entire EA. The committee is responsible of managing the direction and ensuring compliance to meet the target architecture, While, the EA provides the e-transformation committee with the necessary information that present end-to-end holistic picture of the entity, Which, will promote to Effective decision making and support integrative work in order to achieve strategic goals.

B. Strategy and Planning

EA activities depend on the outputs of the strategy and planning sector, and contributes to transforming strategic goals into effective change at the level of the government entity through building transformation plans and achieving alignment between strategy, business and information technology. Also, it contributes to provide feedback to the strategy and planning sector based on the outputs of architectural and gap analysis.

C. Initiatives and Projects

EA contributes in implementing the transformation roadmap, which the initiatives and projects management department can work on it, providing the knowledge of how the project's contribution is achieving the strategic goals, and giving a holistic view of the linkage between projects, to determine the priority of the proposed projects and utilize resources. The office has an important role to ensure the compliance for specific EA standards and requirements that prepare the technical specifications for projects to ensure compliance with EA standards, sharing and reusing the organizational resources. During the life cycle of each project, the EA office continually coordinates with the Project Management to provide the necessary guidance and support regarding the review of the various deliverables to check for correctness and completeness.

D. Information Technology

The IT departments collaborate with EA Office by designing and developing the necessary application and infrastructure solutions based on the target architecture considering the alignment with the EA standards and principles. Also, the EA office contributes in assessing and assuring the compatibility delivered systems and solutions against the target architecture.

4.5 Enterprise Architecture Maturity Model

The DGA has developed an EA maturity model based on international best practices to assess the level of EA maturity in the government entities. Also, the DGA supports entities with the necessary recommendations and suggestions to raise the quality of the EA implementation and ensure alignment with the national EA standards and principles. The maturity level is determined based on a five-level scale (level 0 to 5) as shown in the figure below. Government entities that achieve the third level and above will obtain a certificate of accreditation of the national EA provided by the DGA.

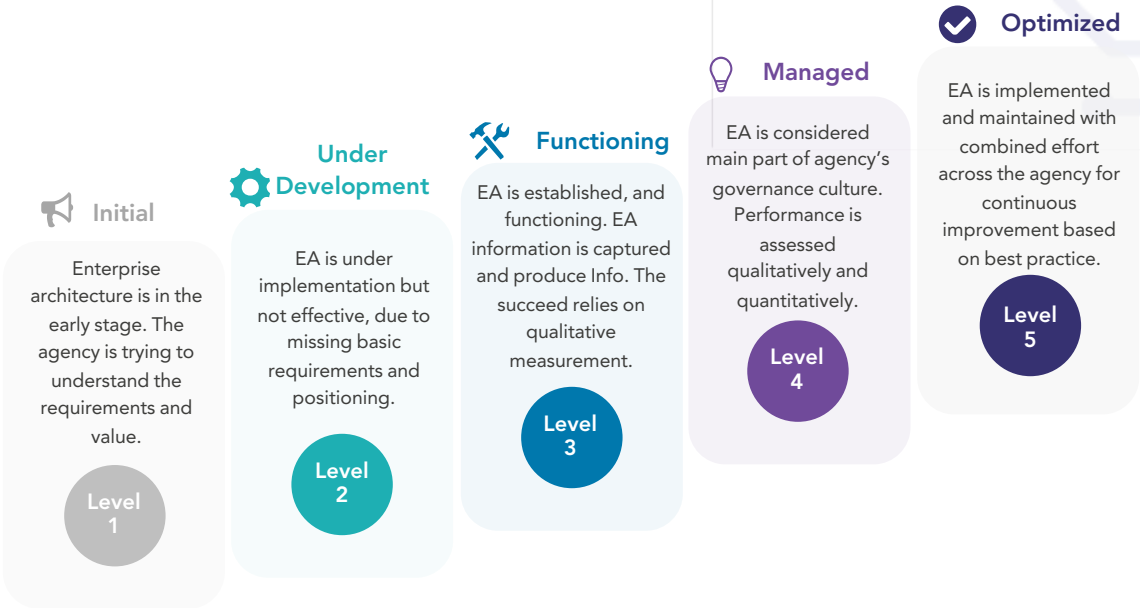


Figure 8 Enterprise Architecture Maturity Levels

Maturity Model Domains

The maturity Model has identified eight maturity domains that are necessarily for establishment, operation and continuous improvement of EA practice in a government entity. Each maturity domain is measured based on various criteria, as showing in the table below.

Domains	Criteria
Strategic Alignment	EA Objectives and Scope
	The alignment between the Business and IT with the Strategic goals
	Get benefit from the international best practice and technology trends
Stakeholders' Support and Involvement	Corporate Management Support
	Business Support
	IT Support
	EA Communication plan with the stockholders
	EA Awareness
EA Framework	EA Framework and Deliverables
	EA Meta-Modeling

Domains	Criteria
EA Governance and Management	EA Governance Structure
	EA Governance Operationalization
	EA Processes and KPI
	EA Interaction
EA Capability	EA Team
	EA Tools and Repository
	Continuance Learning, Training and sharing knowledge
Architecture Content	EA Requirements
	EA Principles
	EA Standards and policies
	EA Deliverables
	EA Data documentation
Target Architecture	EA role in the Digital Transformation
	Transition Planning and roadmap
	EA Compliance and Assurance
	Architecture Change Management
EA Continuous Improvement	Value Realization
	EA Reporting

Table 4 Maturity Model Domains

EA Maturity Assessment

Once the government entity started the EA practice, activated its activities and governed, and executed most of the roadmap. Then, the EA practice maturity of government entity should be assessed by using the EA Maturity Model in order to analyze the gaps for enabling the government entity to achieve a higher maturity level by analyzing the priorities and building an improvement plan for EA practice. Then A report will be developed to provide results and recommendations to raise EA practice maturity level. The report aims to achieve the following objectives for the government entity:

- Define the current maturity levels of EA domains.
- Provide a blueprint about the current state of the EA practice.
- Provide recommendations and suggestions to support the entity for continuous improvement.

05. Definitions

Term	Definition
Authority	Digital Government Authority
Government entity	Ministries, government entities, departments, public bodies and institutions with independent public legal entities
EA Framework	An EA framework defines how to create and use an Enterprise Architecture typically by providing blueprints, structures, common language, methods, tools and templates with the intent of achieving business objectives in alignment with an organization's overall strategy
EA meta model	A model that describes how various objects (i.e., concepts) and their relationships of an enterprise are conceived and arranged in a structured way in order to describe its architecture
BA (Business Architecture)	Business Architecture includes for example: The strategy, initiatives, list of services and business procedures in the government entity
DA (Data Architecture)	Data architecture includes for example: data classification, data exchange, a list of data used in the entity, the definition of its sources and associated databases
AA (Application Architecture)	Application Architecture includes for example: a list of applications and digital products, their characteristics, and integration information
TA (Technology Architecture)	Technology Architecture includes for example: software and hardware licenses, technical infrastructure, networks, communications and data centers

06. Related Legislation and References

- Digital Government business and policies Regulatory Framework
- Enterprise Architecture in the government sector: International and local practices
- National Overall Reference Architecture (NORA)

هيئة الحكومة الرقمية
Digital Government Authority