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Proposal of TOGAF ADM Enterprise Continuum for Organization-Specific Solution on e-Government

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Abstract—This paper presents the proposal of TOGAF ADM Enterprise Continuum for organization-specific solution.

TOGAF includes the concept of the Enterprise Continuum, which sets the broader context for an architect and explains how generic solutions can be leveraged and specialized in order to support the requirements of an individual organization. The Enterprise Continuum is a view of the Architecture Repository that provides methods for classifying architecture and solution artifacts as they evolve for generic Foundation Architectures to Organization-Specific Architectures. The Enterprise Continuum comprises two complementary concepts: the Architecture Continuum and the Solutions Continuum.

This Proposed TOGAF ADM Enterprise Continuum for Organization-Specific Solution on e-Government is focused on addressing enterprise need. The Solution Continuum covers the Opportunity and Solution, Migration Plan, Implementation Governance, and Change Management Domains phases. The method contains guideline solution for those domains include the artifacts that are suitable for E-Government Master Plan. *Index Terms*—TOGAF ADM, Enterprise Continuum, Solution Continuum

I. INTRODUCTION

To design good Master plan of E-Government we must choose a good framework that can be has a guidelines, perhaps methods, or even tools. TOGAF is one of the most interesting frameworks that exist and has very rich angle views to design an IT System for the Enterprise.

A. TOGAF Overview

The Open Group Architecture Framework (TOGAF) is a framework for enterprise architecture, which provides an approach for designing, planning, implementing, and governing an enterprise information technology architecture. [1]. TOGAF has been a registered trademark of The Open Group in the United States and other countries since 2011 [2].

TOGAF is a high level approach to design. It is typically modeled at four levels: Business, Application, Data, and Technology. It relies heavily on modularization, standardization, and already existing, proven technologies and products. An architecture framework is a set of tools which can be used for developing a broad range of different architectures [3]. It should:

- describe a method for defining an information system in terms of a set of building blocks
- show how the building blocks fit together
- contain a set of tools
- provide a common vocabulary
- include a list of recommended standards
- include a list of compliant products that can be used to implement the building blocks.

TOGAF is such an architecture framework. The ANSI/IEEE Standard 1471-2000 specification of architecture (of software-intensive systems) may be stated as: "the fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution.

However TOGAF has its own view, which may be specified as either a "formal description of a system, or a detailed plan of the system at component level to guide its implementation", or as "the structure of components, their interrelationships, and the principles and guidelines governing their design and evolution over time."

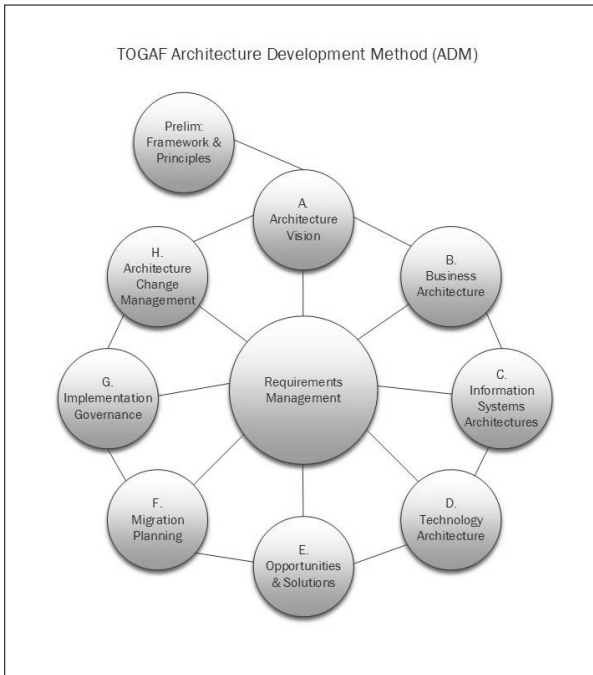


Fig. 1. TOGAF Framework Architecture [4]

B. TOGAF ADM

The Architecture Development Method (ADM) is core of TOGAF which describes a method for developing and managing the lifecycle of enterprise architecture.

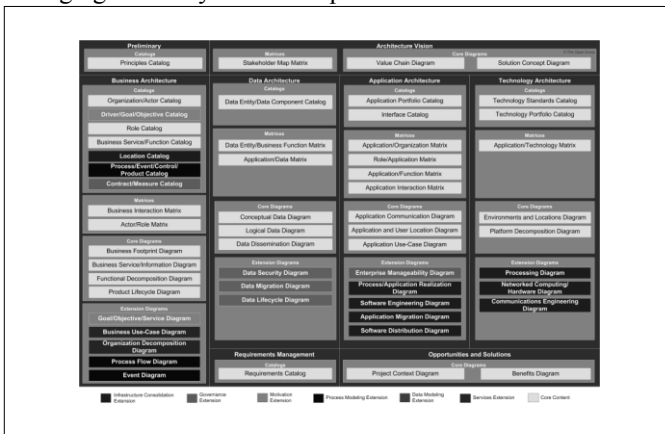


Fig. 2. TOGAF ADM[6]

C. Enterprises Continuum

The Enterprise Continuum is a way of classifying solutions and architectures on a continuum that ranges from generic foundation architectures through to tailored organization-specific both within and outside the Architecture Repository [6]. These include architectural models, architectural patterns, architecture descriptions, and other artifacts. These artifacts may exist within the enterprise and also in the IT industry at large.

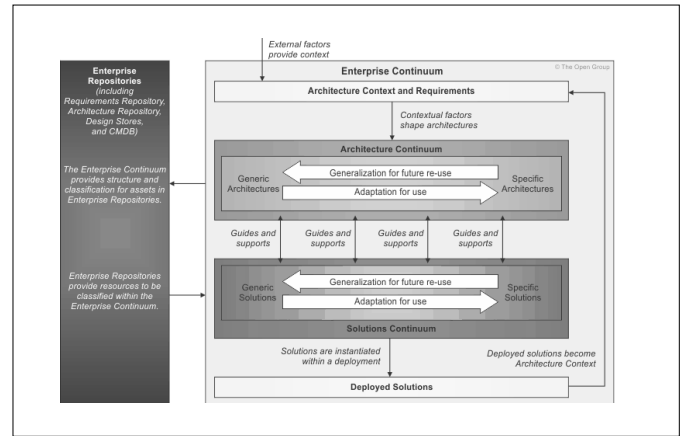


Fig. 3. Enterprise Continuum[6]

The Enterprise Continuum is partitioned into three distinct continua as follows[6]:

- The **Enterprise Continuum** is the outermost continuum and classifies assets related to the context of the overall enterprise architecture. The Enterprise Continuum classes of assets may influence architectures, but are not directly used during the ADM architecture development. The Enterprise Continuum classifies contextual assets used to develop architectures, such as policies, standards, strategic initiatives, organizational structures, and enterprise-level capabilities. The Enterprise Continuum can also classify solutions (as opposed to descriptions or specifications of solutions). Finally, the Enterprise Continuum contains two specializations, namely the Architecture and Solutions Continua.
- The **Architecture Continuum** offers a consistent way to define and understand the generic rules, representations, and relationships in an architecture, including traceability and derivation relationships (e.g., to show that an Organization-Specific Architecture is based on an industry or generic standard). The Architecture Continuum represents a structuring of Architecture Building Blocks (ABBs) which are re-usable architecture assets. ABBs evolve through their development lifecycle from abstract and generic entities to fully expressed Organization-Specific Architecture assets. The Architecture Continuum assets will be used to guide and select the elements in the Solutions Continuum (see below). The Architecture Continuum shows the relationships among foundational frameworks (such as TOGAF), common system architectures (such as the III-RM), industry architectures, and enterprise architectures. The Architecture Continuum is a useful tool to discover commonality and eliminate unnecessary redundancy.
- The **Solutions Continuum** provides a consistent way to describe and understand the implementation of the assets defined in the Architecture Continuum. The Solutions Continuum defines what is available in the

organizational environment as re-usable Solution Building Blocks (SBBs). The solutions are the results of agreements between customers and business partners that implement the rules and relationships defined in the architecture space. The Solutions Continuum addresses the commonalities and differences among the products, systems, and services of implemented systems.

II. OVERVIEW AND ANALYSIS

A. Enterprise Continuum in Detail[6]

The Enterprise Continuum is intended to represent the classification of all assets that are available to an enterprise. It classifies assets that exist within the enterprise along with other assets in the wider environment that are relevant to the enterprise, such as products, research, market factors, commercial factors, business strategies, and legislation.

TOGAF is intended to be a framework for conducting enterprise architecture and as a result many of the assets that reside within the Enterprise Continuum are beyond the specific consideration of the TOGAF framework. However, architectures are fundamentally shaped by concerns outside the practice of architecture and it is therefore of paramount importance that any architecture must accurately reflect external context.

The specific contextual factors to be identified and incorporated in an architecture will vary from architecture to architecture. However, typical contextual factors for architecture development are likely to include:

- External influencing factors, such as regulatory change, technological advances, and competitor activity
- Business strategy and context, including mergers, acquisitions, and other business transformation requirements
- Current business operations, reflecting deployed architectures and solutions

B. Solutions Continuum Overview

The Solutions Continuum represents the detailed specification and construction of the architectures at the corresponding levels of the Architecture Continuum. At each level, the Solutions Continuum is a population of the architecture with reference building blocks - either purchased products or built components - that represent a solution to the enterprise's business need expressed at that level. A populated repository based on the Solutions Continuum can be regarded as a solutions inventory or re-use library, which can add significant value to the task of managing and implementing improvements to the enterprise.[6]

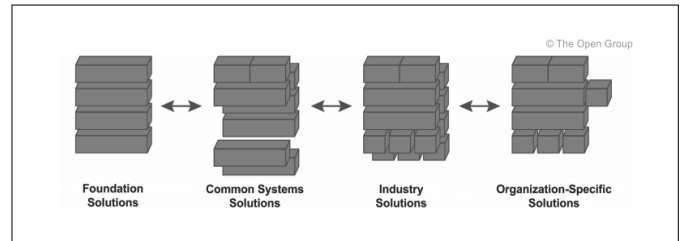


Fig. 4. Solutions Continuum[6]

III. PROPOSED GUIDELINES AND FEATURED ARTIFACTS

A. Proposed Solutions Continuum

The Enterprise Continuum consists of both the Architecture Continuum and the Solutions Continuum. The Architecture Continuum specifies the structuring of reusable architecture assets and includes rules, representations, and relationships of the information system(s) available to the enterprise. The Solutions Continuum describes the implementation of the Architecture Continuum by defining reusable solutions building blocks.

Model in Fig. 5. is proposed additional guidelines for the enterprise continuum for organization-specific solutions. The proposed solutions continuum is focused on addressing enterprise need. As seen in the figure, the solutions contain high amount of unique content because they are designed for specific business operations in order to accommodate the varying process. Following describes catalogs, matrices, and diagrams that may be created in each phase in the proposed additional guidelines.

- Opportunities and Solutions
 - SWOT Analysis Diagram

A SWOT Analysis Diagram shows the strength, weaknesses, opportunities, and threats involved in implementing E-Government.
 - Technical Benefit Catalog

The Technical Benefit Catalog shows technical opportunities and benefits identified in the master plan. This catalog can be used by stakeholders to make prioritization and sequencing decisions on identified information.
 - Enterprise Solution Catalog

An Enterprise Solution Catalog shows high level solutions of an organization in implementing the master plan.
 - Technical Solution Catalog

The Technical Solution Catalog shows solutions in technical aspect.

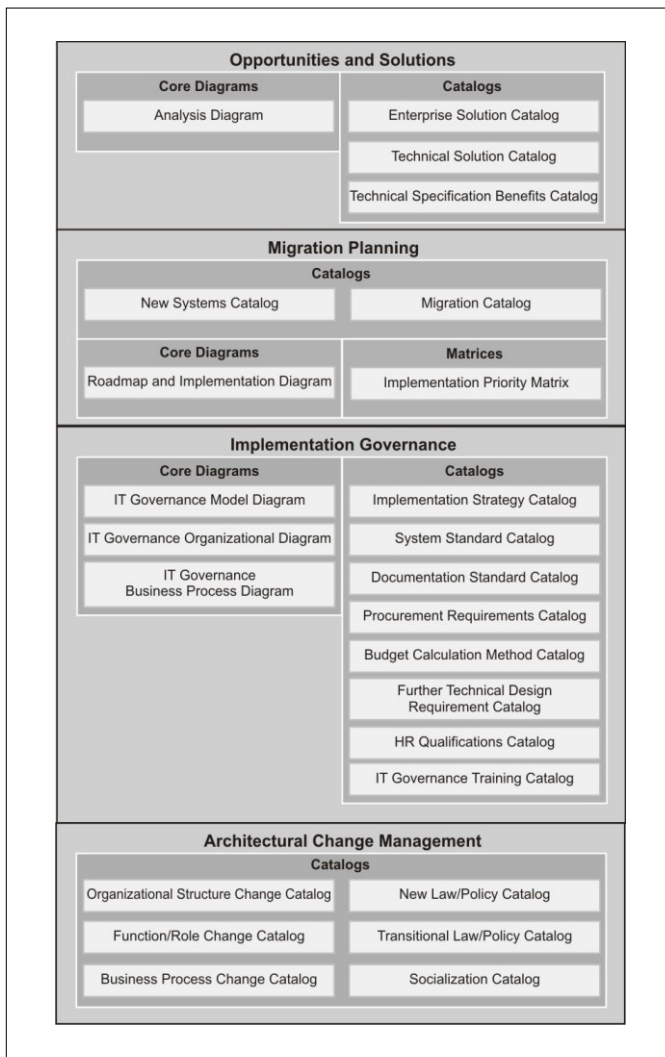


Fig. 5. Proposed Solution Guidelines

- **Migration Planning**
 - **New Systems Catalog**
A New Systems Catalog contains systems, including applications, information systems, technologies, and supporting infrastructures, that are proposed in the master plan.
 - **Migration Catalog**
A Migration Catalog shows existing systems, including applications, information systems, technologies, and supporting infrastructures, within the environment of master plan design.
 - **Roadmap and Implementation Diagram**
A Roadmap and Implementation Diagram shows the scope of all work packages to be implemented as a part of master plan design in each certain period.
 - **Implementation Priority Matrix**
The Implementation Priority Matrix shows relations of one system to others and its implementation priority.
- **Implementation Governance**
 - **IT Governance Model Diagram**
IT Governance Model Diagram shows process chain that manages proposed business processes and implemented business processes.
 - **IT Governance Organizational Diagram**
The IT Governance Organizational Diagram shows organizational diagram in IT governance inside a certain organization.
 - **IT Governance Business Process Diagram**
The Business Process Diagram shows business processes, either proposed or implemented ones.
 - **Implementation Strategy Catalog**
An Implementation Strategy Catalog contains any strategy needed to implement the system.
 - **System Standard Catalog**
A System Standard Catalogs shows minimum standard for each system, includes application, information systems, and infrastructures.
 - **Documentation Standard Catalog**
The Documentation Standard Catalogs shows documents that have to be provided as part of requirements on system development.
 - **Procurement Requirements Catalog**
A Procurement Requirements Catalog captures things that the organization/government needs to procure to implement the master plan.
 - **Budget Calculation Method Catalog**
The Budget Calculation Method Catalog shows how to do budget calculation to realize the systems needed in the master plan.
 - **Further Technical Design Requirements Catalog**
The Further Technical Design Requirements Catalog shows requirements that are needed to do further design on technical aspects.
 - **HR Qualifications and Training Catalogs**
An HR Qualifications and Training Catalog show qualifications that are required to obtain specific role or position; and proposed trainings to improve human resources quality and capability to meet the organization/government needs.
 - **IT Governance Training Catalog**
The IT Governance Training Catalog contains a number of training in IT Governance to be provided in the organization.
- **Architectural Change Management**
 - **Organizational Structure Change Catalog**
An Organizational Structure Change Catalogs contains organizational changes and transitions that will be made as a result of master plan implementation.

- **Function/Role Change Catalog**
The Function/Role Change Catalogs contains functional/role changes and transitions that will be made as a result of master plan implementation.
- **Business Process Change Catalog**
A Business Process Change Catalogs contains business process changes and transitions that will be made as a result of master plan implementation.
- **New Law/Policy Catalog**
The New Law/Policy Catalog contains recommendations on lawmaking, including proposal of new rules and revision on existing rules.
- **Transitional Law/Policy Catalog**
A Transitional Law/Policy Catalogs contains laws/policies that will be made and implementation within the transitional phase of master plan implementation.
- **Socialization Catalog**
The Socialization Catalog contains recommendations and guides to socialize the master plan to the community.

B. Featured Artifacts.

Following are several artifacts in the E-Government Master Plan Design with TOGAF Framework[7] which implements the proposed enterprise continuum.

1) Opportunities and Solutions

a) Analysis Diagram SWOT Analysis

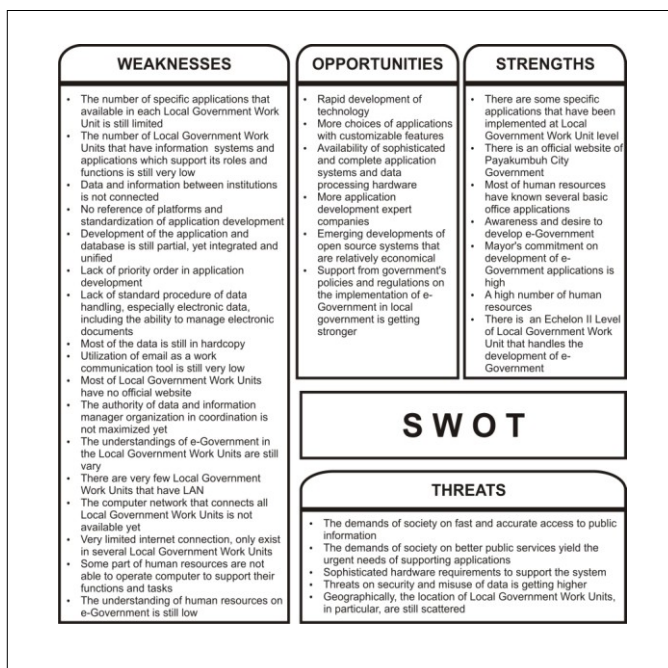


Fig. 6. SWOT Analysis

2) Migration Planning

a) Roadmap Diagram



Fig. 7. Roadmap Diagram

b) Migration Plan Catalog

TABLE I. MIGRATION PLAN CATALOG

Plans	Description
Centralized Internet Service and Network Implementation	Internet services in Payakumbuh City Government's environment are done centrally
Migration of Existing Information Systems and Applications into Cloud Data Center	All information systems and application that exist in Payakumbuh City Government are being migrated into the city's centralized cloud data center
Addition of new links and features of Payakumbuh City Government's official website	Payakumbuh City Government's official website is being migrated into Cloud Platform then several features are being added to support e-Government operation.

3) Implementation Governance

a) IT Governance Model Diagram

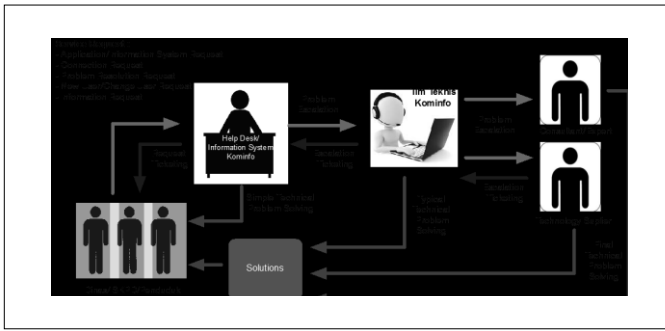


Fig. 8. IT Governance Model Diagram – Helpdesk

b) Documentation Standard Catalog

TABLE II. DOCUMENTATION STANDARD CATALOG

Standards	Documents	
Documentation Standards of Information System and Application Procurement.	A. Requirement Specification	B. Analysis Document
	C. Design Document	D. Construction Document
	E. Test Plan Document	F. System Acceptance/Test Report
	G. Implementation Scenario	H. Implementation Report
	I. User Guide Document	J. Change Request Document
	J. Change Request Document	
Documentation Standards of IT Infrastructure Procurement.	A. Test Plan Document	B. System Acceptance
	C. Design Document	D. Implementation Report
	E. User Guide Document	F. Post Implementation Report

4) Architectural Change Management

a) Organizational Structure Change Catalog

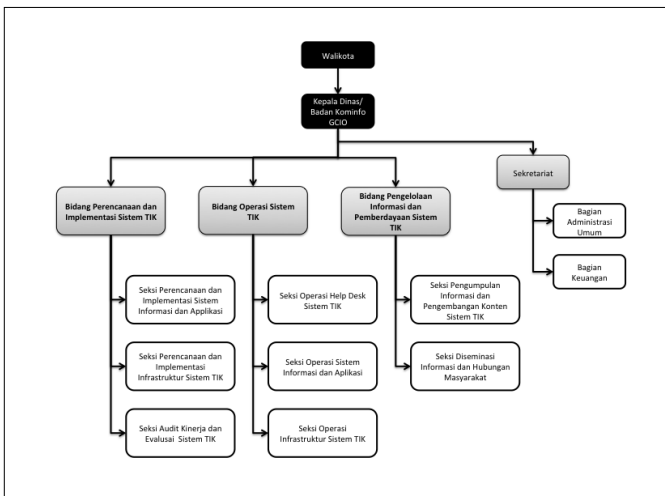


Fig. 9. Organization Diagram

IV. CONCLUSIONS

This Proposed TOGAF ADM Enterprise Continuum for Organization-Specific Solution on e-Government is focused on addressing enterprise need. As seen in the figure, the solutions contain high amount of unique content because they are

designed for specific business operations in order to accommodate the varying process.

The Solution Continuum covers the Opportunity and Solution, Migration Plan, Implementation Governance, and Change Management Domains phases. The method contains guideline solution for those domains include the artifacts that are suitable for E-Government Master Plan.

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