An Integrative Framework of COBIT and TOGAF for Designing IT Governance in Local Government

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Abstract—**To implement the good IT governance in local governance, we need an IT governance design for mature and appropriate models. There are some problems that appear in designing information technology governance in local government. The problem is how to control the information technology risk management at the operational level and designing information technology in mapping an integrated framework. So this led to the adoption of information technology in local government to be inefficient.**

This study proposes an integrated model framework of COBIT and TOGAF to design more comprehensive IT Governance to increase the efficiency of the application of IT in local government. An integrated model to solve the problem of IT risk management control are using the COBIT 5 framework. To solve the problem in designing an integrated IT governance is used TOGAF 9.1 framework. The result is the integration model combines three aspects: governance area, 6 principles and management area are used for the effective application of IT governance in local government.

Keywords: COBIT; TOGAF; IT Governance; Local Government

I. INTRODUCTION

Dependence on information technology (IT) is a characteristic common to virtually all modern organizations including religion government. The utilization of IT governance in government organizations at central and regional levels will ensure the improvement of efficiency, effectiveness, transparency and accountability in good governance[1].

IT Governance success is determined by the alignment of the application of IT and organizational objectives. IT alignment becomes an important issue in strategy development and organizational performance improvement to define organizational strategy and operate the organization in a way intended to help realize its business goals and objectives[2]. The various models of IT governance best practices in the world have been widely introduced, such as: COSO, COBIT, ITIL, IT Security, National Institute of Standards and Technology (NIST), the British Standards Institution (BSI) Baselines, ISO / IEC 27002, ISO / IEC 385000, and others. Each has its advantages and disadvantages[3].

Recent work has reported that a number of IT governance frameworks, each have its advantages and disadvantages that can be integrated. A benchmarking of the different standard

frameworks used for IT governance in order to detect complementarities and intersection in order to facilitate the implementation[4].COBIT framework has the advantages of controlling aspects of governance structure so that it can be integrated with TOGAF which has the advantages of aspects of integrated IT architecture. This research proposes the integration of COBIT and TOGAF as a standard model for the design of IT Governance in local government.

II. LITERATURE REVIEW

A. IT Governance

The term *governance* in business contexts refers generally to the set of policies, processes, and actions taken by management to define organizational strategy and operate the organization in a way intended to help realize its business goals and objectives. In contrast, *IT governance* refers to the structure and processes organizations use to try to ensure that their IT operations support the overall goals and Objectives of the organization. According to the IT Governance Institute, governance objectives applicable to virtually any organization include aligning IT strategy with enterprise strategy, allocating IT resources efficiently to support the achievement of organizational objectives and realize the value anticipated from IT investments, and effectively managing IT-related risk[2]. With the addition of performance measurement to allow organizations to assess to what extent they are achieving their objectives, IT governance comprises the management functions as depicted in Figure 1.
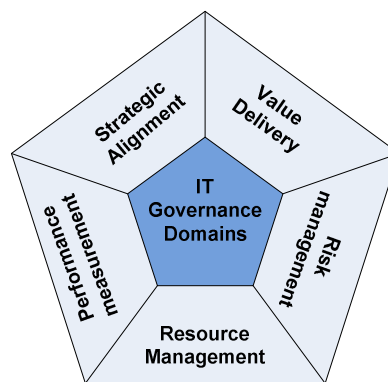

Fig.1. IT Governance Focus Area [5]

B. COBIT

The latest version of COBIT, COBIT 5 [6], is recently introduced. Thus, an analysis and comparison between COBIT 5 concepts and existing literatures may help researchers understand the gap between the practical world and academic world. COBIT 5 is new and has a limited number of academic literatures that discussed about it[7]. COBIT 5 is introduced as a framework for "Enterprise governance of IT" rather than "IT Governance". Enterprise governance of IT shares similar concept to IT governance but it emphasizes on the involvement and responsibility of business side rather than technical side[7]. COBIT 5 is designed to be a single integrated framework that can be used for both governance and management[6]. COBIT 5 defines governance as: "Governance ensures that stakeholder needs, conditions and options are evaluated to determine balanced, agreed-on enterprise objectives to be achieved; setting direction through prioritisation and decision making; and monitoring performance and compliance against agreed-on direction and objectives"[6]. COBIT 5 Principles show in Figure. 2.
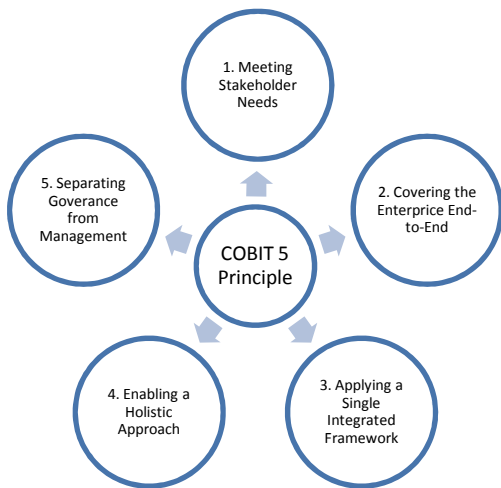

Fig. 2. COBIT 5 Principles[6]

C. TOGAF

TOGAF is a framework (a detailed method and a set of supporting tools) for developing enterprise architecture. TOGAF provides the methods and tools for assisting in the acceptance, production, use, and maintenance of enterprise architecture. It is based on an iterative process model supported by best practices and a re-usable set of existing architecture assets. It may be used freely by any organization wishing to develop an enterprise architecture for use within that organizations[8][9]. The TOGAF ADM (Architecture Development Method) describes a process for deriving an organization-specific enterprise architecture that addresses business requirements.

The major component of TOGAF and provides guidance for architects on a number is provides a number of architecture development phases (Business Architecture, Information

Systems Architectures, Technology Architecture) in a cycle, as an overall process template for architecture development activity. It provides a narrative of each architecture phase, describing the phase in terms of objectives, approach, inputs, steps, and outputs. The inputs and outputs sections provide a definition of the architecture content structure and deliverables. It provides cross-phase summaries that cover requirements management
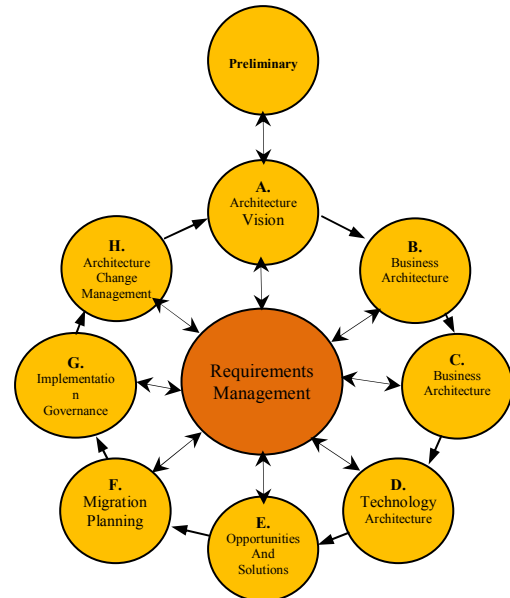

Fig. 3. Architecture Development Method[9]

The major component of TOGAF and provides guidance for architects on a number of levels[8]:

- It provides a number of architecture development phases (Business Architecture, Information Systems Architectures, Technology Architecture) in a cycle, as an overall process template for architecture development activity.
- It provides a narrative of each architecture phase, describing the phase in terms of objectives, approach, inputs, steps, and outputs. The inputs and output sections provide a definition of the architecture content structure and deliverables.
- It provides cross-phase summaries that cover requirements management.

III. AN INTEGRATIVE FRAMEWORK MODEL: COBIT AND TOGAF

An integrative approach to the IT Governance framework is made to take the advantages that exist in each framework to produce hybrid models. An integrative COBIT method will be designed to resolve the problem of IT risk control management and TOGAF method for designing IT governance integrated and more comprehensive. This research proposes an integration of COBIT and TOGAF Model for Designing IT Governance produce better standards to improve the efficiency of the application of IT in local government.

A. COBIT and TOGAF

The following COBIT 5 areas and domain are covered by TOGAF[4]. Resource-related processes in the EDM (governance) domain – The TOGAF Components of an Architecture Board, architecture Governance and Architecture Maturity Models Map to resource optimization.

TABLE I. MATCHING COBIT AND TOGAF ACTIVITIES[10]

TOGAF Phase/Activity	COBIT Process/practice
Preliminary phase	Manage the IT Management Framework
	Manage Enterprise Architecture
Architecture vision	Developing an architecture vision
Business Architecture	Defining reference architecture
Information System Architecture	Defining reference architecture
Technology Architecure	Defining reference architecture
Opportunities & Solutions	Selecting opportunities and solutions
Migration planning	Defining architecture implementation
Imlementation governance	Architecture Services
Architecture change management	Architecture Services
Requirements management	Architecture Services

Table I. Show the matching COBIT cover most of the activities of TOGAF that describes them only at a high. Provides a slightly different view on activities and deliverables. Covers only the IT-perspective; enterprise architecture also includes the business perspective[10]. COBIT also adds information to the TOGAF activities by relates them to generic IT-related goals and accompanying metrics and adds responsibilities for TOGAF activities. COBIT puts TOGAF into context by relating architecture processes to all other IT-processes.

COBIT 5 Management Practice   **TOGAF**

APO03.01 Develop the enterprise architecture vision   H, Prelim + A
APO03.02 Define reference architecture   B, C, D
APO03.03 Select Opportunities and solutions   E
APO03.04 Define architecture implementation   F
APO03.05 Provide enterprise architecture services   G+
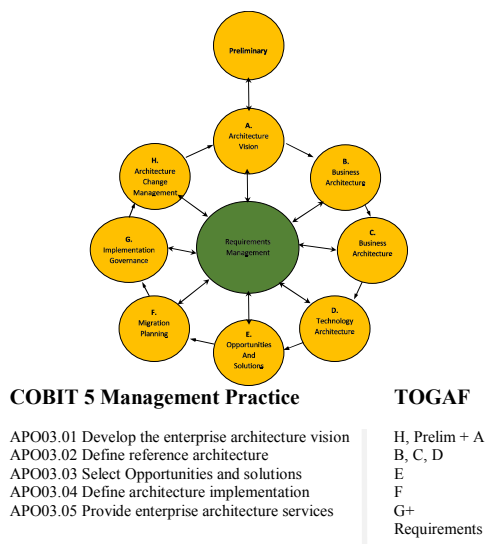   Requirements

Figure. 4. Mapping COBIT 5 to TOGAF 9 [10]

Figure 4 Show mapping COBIT 5 to TOGAF 9 matching activities that is develop a comprehensive set of guidelines to enable them to implement and conform to the an integrative Framework. The domain of COBIT related processes in the EDM the enterprise architecture in the APO domain. In the core of TOGAF is the Architecture Development Method cycle, which maps to the COBIT 5 practices of developing an architecture vision (ADM phase A), defining reference architectures (ADM phases B, C, D), selecting opportunities and solutions (ADM phase E), and defining architecture implementation (ADM phases F, G). A number of TOGAF components map to the COBIT 5 practice of providing enterprise architecture services. These include:

- ADM Requirements Management
- Architecture Principles
- Stakeholder Management
- Risk Management
- Business Transformation Readiness Assessment
- Architecture compliance
- Architecture contracts
- Capability-based Planning

IV. PURPOSE MODEL OF IT GOVERNANCE FOR LOCAL GOVERNMENT BASE ON COBIT AND TOGAF

Conceptual model described in the previous section illustrates that enterprise governance at a local government effort to achieve the goals and objectives (business goal) from the organization. Based on the Regulation of the Minister of Communications and Informatics of the Republic of Indonesia, Number:41/PER/MEN.KOMINFO/2007 on General Guidelines for National ICT governance in Indonesia has goal as follows[1]. General Guidelines Governing the purpose of the National ICT is to provide limits and guidelines for government agencies and entities in which decision-makers in the management of ICT resources.

General guidelines developed ICT Governance will also be a reference for parties outside government institutions following, to give an opinion, assessment and evaluation of the implementation of ICT in Government:
a. Internal auditors of government
b. The business community
c. Public

The following aspects are expected to increase significantly with the implementation of the General Guidelines for National ICT Governance:
a. Synchronization and integration of the National ICT Plan
b. National ICT spending efficiency
c. Realization of ICT solutions that fit the needs efficiently
d. Operation of ICT systems that provide significant added value to the public and internal government management

Based on the purpose of the governance guidelines national tick above, it is designed integrative models based on COBIT Framework and TOGAF for local government. The proposed model is based on Table II. Show input from process by COBIT to TOGAF architecture.

TABLE II.   INPUTS TO ARCHITECTURE BY COBIT[10]

From Process	Product
Outside COBIT	Enterprise strategies
	Enterprise drivers
Ensure Resource Optimisation	Guiding principles for enterprise architecture
Manage the IT Management Framework	Enterprise operational guideline
	Definition of organizational structure
	Defined operational placement of IT function
	Evaluation of options for IT organization
	Data classification guidelines
	Communications ground rules
	IT-related policies
	Communications on IT-Objectives
	Process improvement opportunities
Manage strategy	Strategic road map
	Proposed enterprise architecture change
	Communication package

IT governance for the government is basically built on the principles of corporate governance contained in the document ISO 38500, which is the responsibility, strategy, acquisition, performance, compliance, and human behavior. These principles must be going well for the practice of governance or management practices. Governance practices consist evaluating process, direct, monitor (EDM) and practice management comprises planning process (APO), building (BAI), runs (DSS), and monitor (MEA). Processes contained in the administration or management must meet six key principles previously described government organizations and IT in it must adhere to a predetermined process. This is depicted in a governance model based on an integrated framework as shown in Figure.5

This proposed model illustrates how IT governance should construct aligned with the enterprise governance base on COBIT to the input TOGAF architecture framework. It means that IT governance is no longer purely the responsibility of the IT unit, but became an integral part of government organization with comprehensives so that corporate governance relating to conformance can be run with better and business governance relating to performance is also able to produce something useful for government institutions. The implementation of the key principles in the IT governance process will ensure that every step taken in line with the vision and mission of the context public society needs.

Governance functions in government institutions will be translated in the form of evaluating, direct, and monitor the pressure that will accommodate business and stakeholder requirements that can be translated into the development plans in the area management. In the management area, the direction of governance will be translated in the form of planning, development, implementation, and internal evaluation.

V.   CONCLUSION AND FUTURE WORK

COBIT is used to support in applying policy standards as well as the basic framework in decision to use of information technology in government institutions. TOGAF is used for the design of information architecture in general and comprehensible. Both methods can be integrated into a hybrid model of its governance framework.

The final result in research is the form of a model process architecture framework TOGAF base on COBIT and proposed to local government. In this research needs to be done further exploration to determine the proposed model has been appropriate with existing standards or only limited exploration of models that already exist.

REFERENCES

[1] Departemen Komunikasi dan Informatika, "Panduan Umum Tata kelola TIK Nasional," vol. 1, 2007, pp. 1–49.

[2] S. D. Gantz and S. Maske, *The Basics of IT Audit The Basics of IT Audit Practical Information*. Elsevier Inc., 2014.

[3] S. De Haes, W. Van Grembergen, and R. S. Debreceny, "COBIT 5 and Enterprise Governance of Information Technology: Building Blocks and Research Opportunities.," *J. Inf. Syst.*, vol. 27, no. 1, pp. 307–324, 2013.

[4] S. Ramlaoui and A. Semma, "Comparative study of Comparative study of COBIT with other COBIT with other COBIT with other IT Governance IT Governance Frameworks rameworks rameworks," *IJCSI*, vol. 11, no. 6, pp. 95–101, 2014.

[5] K. Brand and H. Boonen, *IT Governance based on Cobit 4.1-A Managrment Guide*, Third edit. ITSMF Library, 2007.

[6] Isaca, *A Business Framework for the Goverance and Managemnt of Enterprise IT*. 2012.

[7] A. Preittigun and W. Chantatub, "A Comparison between IT Governance Research and Concepts in COBIT 5," *Int. J. Res. Manag. Technol.*, vol. 2, no. 6, pp. 581–590, 2012.

[8] A. Josey, R. Harrison, P. Homan, M. F. Rouse, T. van Sante, M. Turner, and V. Der Merwe, *TOGAF® Version 9.1 – A Pocket Guide*, First edit. Van Haren Publishing, Zaltbommel, 2011.

[9] R. Harrison, "TOGAF TM 9 Foundation Study Guide," in *The Open Group*, First edit., Van Haren Publishing, Zaltbommel, www.vanharen.net, 2009, p. 243.

[10] D. Greefhorst, "TOGAF and Major IT Frameworks, Architecting The Family," 2014.

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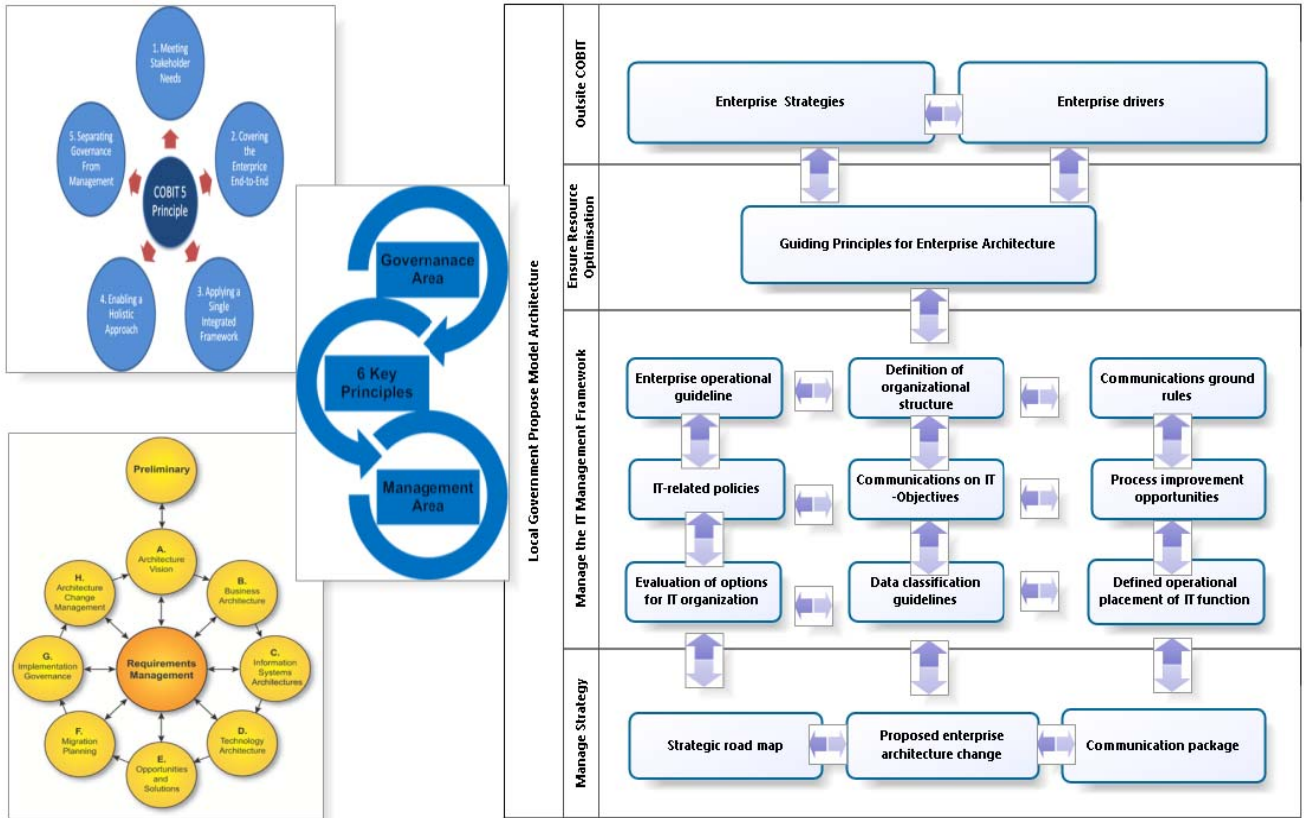

Figure. 5. Purpose Model of IT Governance for Local Government.