INFORMATION SYSTEM STRATEGIC PLANNING BASED ON TOGAF ADM FRAMEWORK IN 1ST REVENUE FUNCTIONS DEPARTMENT OF REVENUE AND FINANCIAL MANAGEMENT BANDUNG REGENCY

Theresia Yudith Dwi Prisila[1], Yuli Adam Prasetyo[2], Ridha Hanafi[3].

[1]Department of Industrial Engineering Telkom University, Bandung, Indonesia
[2]Department of Industrial Engineering Telkom University, Bandung, Indonesia
[3]Department of Industrial Engineering Telkom University, Bandung, Indonesia
Jln Telekomunikasi no 1, Dayeuh Kolot, Bandung, 40257
Telp: (022) 7564108, Fax: (022) 7565200.
Email: thyudith@gmail.com[1], y.adam.prasetyo@gmail.com[2], ridhanafi@gmail.com[3]

ABSTRACT (80-100 words)

DPPK is Department of Revenue and Financial Management in Bandung Regency. DPPK is divided into five divisions, namely 1st Revenue, 2ndRevenue, Budgeting, Treasury and Accounting Section. 1st Revenue section who responsible to manage income of Bandung Regency in local tax, local retribution, local own source assets and local own source revenue and focused on managed local tax of Bandung Regency. To improve local tax services in Bandung Regency, DPPK can use information technology advances that supports business activity in 1st Revenue Section with information system strategic planning. Information system strategic planning using TOGAF ADM framework to harmonize business strategy and IT strategies based on business needs.
Key words: Information System Strategic Planning, TOGAF ADM, Business Architecture, Information System Architecture, Technology Architecture, Opportunities and Solution, Roadmap

1. INTRODUCTION

Information technology at the present time has become an important part of a company. Various advantages around development of information technology (IT) to increase the additional value for a company, making information technology a part that must be integrated with the company strategic system. The government has also sees opportunities to increase their IT investments and deliver additional value in construction (Mechling,1999). As a form of IT investment in Government, Indonesian government issued Laws No. 25 Year 2004 concerning National Development Planning System related to the IT Strategic Plan that one of its goals to ensure the creation of integration, synchronization, and synergy between regions, interspaces, intertime, between government functions or central and regional governments. This law was followed publication of the Ministry of home affairs Circular Letter No. 050/2002 / SJ dated August 11, 2005. It also encourages all levels of local governments to participate in building the nation through IT based services, including Bandung regency government.

In the process of functions implementation, DPPK has built and implementing IT used to improve performance in every division. The information system currently used by all levels in DPPK namely Local Area Information System Management (SIMDA) for Finance and SIMDA Revenue is used by internal DPPK, while there is a Information System Management of Tax Object (SISMIOP) used for managing online land and building tax (PBB) which related to public service. SIMDA Pendapatan will manage all processes related to treasury functions, accounting, and budget. For each process running on the Revenue I can using SIMDA Pendapatan, Revenue I would run every process relating to Revenue I management, which consists of the hotel tax, restaurant tax, entertainment tax, advertisement tax, street lighting tax, non-metal and rocks mineral tax, parking tax,

water tax and wallet birds nest tax. Table I will explain the details of running IT status, IT linkages with each other can be seen in the column of integration, as well as additional information on the background of the formation of the existing IT.

Table 1. Information IT Status in DPPK

Information Technology		Division					
		1ST Revenue	2nd Revenue	Treasury	Accounting	Budgeting	Details
SIMDA Keuangan	Budgeting Function					V	Hibah BPKP Application and in one application.
	Bookkeeping Function				V		
	Administration Function			V			
SIMDA Pendapatan	Revenue Function	V					Hibah BPKP Application and not yet related with SISMIOP and SIMDA Keuangan
SISMIOP	Online PBB Function		V				Develop Application and n ot yet related with SIMDA Keuangan and SIMDA Pendapatan

When viewed as a whole of any association with the IT function that runs in DPPK, DPPK has utilize IT well for its use in the internal environment of DPPK, but the internal environment is still not well integrated with each other. Whereas, public and external environment of DPPK still cannot properly utilize IT services.

Various problems faced by DPPK in the utilization of IT investments can be explained into several parts: the first one is no IT master plan which also resulted in the use of IT. This can be demonstrated with a system that is already running is still not maximized properly, because they walk on his own and not integrated, seen from SISMIOP and revenue SIMDA that's not integrated with each other directly, which

should have been integrated each other because of what was gained by revenue management must be stated in the financial statements that are managed by financial SIMDA. Another impact is IT that has built such financial SIMDA, Revenue SIMDA and SISMIOP in its implementation is still not operate properly due to a lack of understanding of IT and infrastructure are inadequate and not in accordance with the needs of the DPPK. Based on interviews that have been conducted also explained that indeed there are some obstacles in IT operations already underway and better knowledge is needed about IT so that the existing system can be used optimally to assist the process that runs in the five functions of DPPK. Secondly which can be noted that the use of IT in DPPK just focused on internal needs of DPPK itself, but in the implementation of public services cannot be maximized properly. The public services that provided by DPPK is for tax services and it's the important thing or the main focus in DPPK.

Based on the existing problems, the solutions that exist to align business with IT needs in DPPK is to plan and build a strategic plan for information systems. A wide variety of approaches can be made in developing a strategic plan for information systems and this study using enterprise architecture approach. Enterprise architecture is a unified framework that translates corporate strategy into an information system plan (Henk Jonkers, 2006). Enterprise architecture can optimize IT investments on every function in the DPPK and integrating business strategy with IT strategy of DPPK. The steps that can be done so that the implementation of IT can be aligned with the business strategy of DPPK and also the implementation of existing IT can improve the performance of DPPK needed a framework into their planning processes. In designing enterprise architecture there are several frameworks like TOGAF, Zachman, Federal Enterprise Architecture Framework (FEAF) and Gartner (Sessions, 2007).In this study, TOGAF framework are used because TOGAF has a perspective that is very rich for designing an IT system in the enterprise.

2. THEORETICAL BACKGROUND

2.1 Information System Strategic Planning with Enterprise Architecture Approach

According to Ward and Peppard (Peppard, 2002), the information technology strategy is a strategy that focuses on establishing a vision of how technology can support in meeting the information needs of an information and systems. Meanwhile, information strategy planning is the process of identifying application portfolio SI-based computer that will support organizations in the implementation of business plans and reach business goals. Strategic planning of IS / IT study the effect of the IS / IT to business performance and contribution to the organization in selecting the strategic steps. In addition, the strategic planning of IS / IT also describes a variety of tools, techniques, and frameworks for management to align the IS / IT with business strategy, even seeking new opportunities through the application of innovative technologies. With the strategic information system planning in an organization or company there are some benefits that will be found by Anita Cassidy in her book, such as management effectiveness at critical asset in an organization. Effectiveness required in a business process that runs in organization for the movement planning. Then improve communication and relations between business and IT organization. Also aligning IT with the direction and priorities of the business and can identify opportunities in the use of IT to enhance business value, planning the flow of information and process, allocating IT effectively and efficiently and reduce effort and money required throughout the system life cycle. Architecture that are in the scope of the organization known as enterprise architecture (EA). EA is complete unity of principles, methods, and models used in the planning and implementation of the enterprise organizational structure, business processes, information systems and infrastructure (Robert Winter, 2007). EA provides a blueprint that describes the organization's current environment and future followed by implementation and maintenance. With the EA in an organizations can optimize IT investments in accordance with the organization's business strategy. If you are associated with the enterprise, then the EA must provide strategies that enable organizations to support the current condition and also acts as a roadmap toward a targeted environment.

2.2 TOGAF ADM

TOGAF ADM describes a method for developing enterprise architecture and establish the core of TOGAF. TOGAF ADM also integrates elements of TOGAF and described in the document as well as other architectural assets available to meet business and IT requirements of an organization. ADM to form an iterative cycle for the entire process, between phases and in each phase which every new decision iteration should be taken. The decision is intended to determine the extent of enterprise scope, level of detail, time targets to be achieved and architectural assets that will be explored in the enterprise continuum. ADM is a common method so that if necessary in practice, ADM can be adjusted to the particular specific needs, for example, combined with other frameworks that ADM produces specific architecture to the organization.

The following stages in TOGAF ADM used to design information strategic planning in 1ˢᵗ revenue function DPPK:

1. Preliminary Stage
   This stage defines the preparation of where, what, why, who, and how in the design of the companies concerned. The aim of this stage is the design organization and governance, general principles, methods and tools used, early in the cycle of ADM.

2. Architecture Vision
   This is the initial stage of the development cycle architecture that includes defining the scope, identify stakeholders, preparation of architectural vision, and filing an agreement to start development of the architecture.

3. Business Architecture
   This phase includes the development of business architecture to support the vision of architecture that has been agreed upon. At this stage, tools and general method for modeling such as: Integration Definition (IDEF) and Unified Modeling

Language (UML) can used to build the model required.

4. Information System Architecture

This stage more emphasis on activity how to developed information system architecture. Defining the information system architecture in this stage include data architecture and application architecture that will be used by the organization. Data architecture highly focuses on how the data is used for the needs of business functions, processes and services. The technique can be used with are: ER-Diagram, Class Diagram and Object Diagram.

5. Technology Architecture

Building a technology architecture that is needed, starting from determinate the type of technology required using Technology Portfolio Catalog that includes software and hardware. In this stage also considering the alternatives necessary in selection of technology.

6. Opportunities and Solutions

This stage is first step in the implementation of what's planned in the previous stage. This step requires the identification of the project implementation.

3. RESEARCH METHOD

3.1 Conceptual Model

The conceptual model describes the concept of logic description to help solving the problems that will be designed in this study. Here Figure I is a conceptual model that was designed to help solving the problems that will be designed information system strategic planning in DPPK:

Figure 1. Conceptual Model

3.2. Research Systematic

Research systematic consisted of troubleshooting steps in the strategic planning of information systems based on TOGAF framework. Research systematic explains the details of the way to do the research based on the conceptual model.
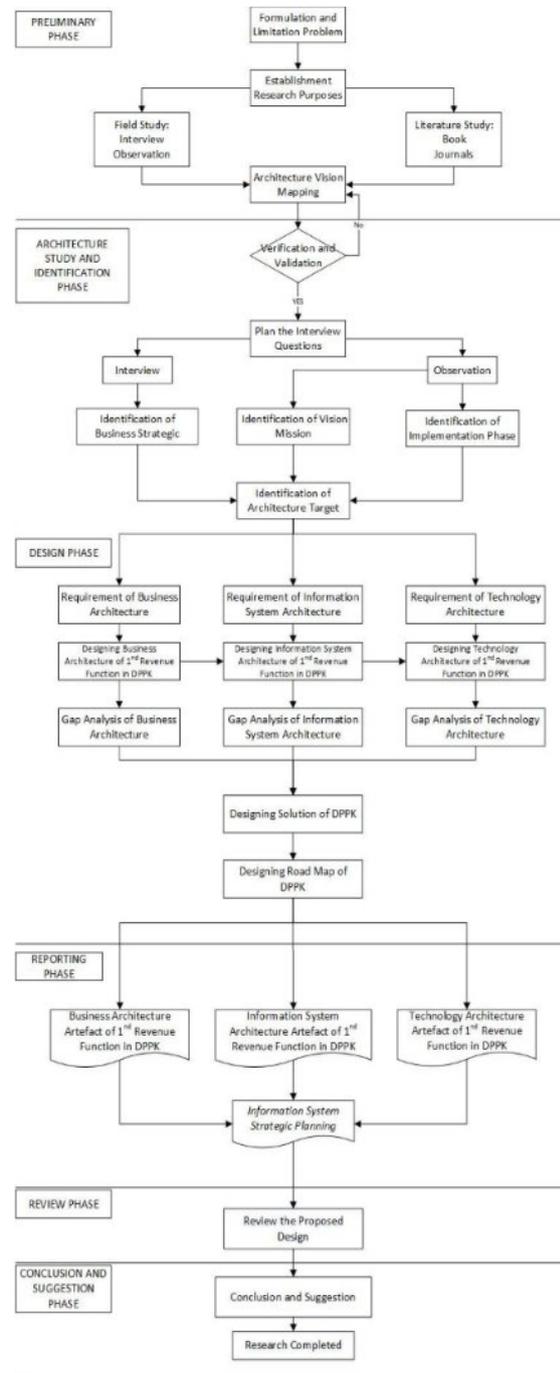

Figure 2. Research Systematic

4. ANALYSIS AND DESIGN

4.1. Preliminary Phase

Preliminary phase required to meet the business directive for new enterprise architecture or establish the parameter for a successful iteration. The main objectives of preliminary phase is determine and establish the architecture capability desired by the organization (The Open Group,2011). The output from this phase is principles catalog captures principles of the business and architecture principles consisting of data architecture, application architecture and technology architecture that describe what a good solution or architecture should look like.

Table 2. Principle Catalog

Architecture Principle	Name
Business Principles	Business and IT alignment
	Service orientation
	Business continuity
	Compliance with standards and policies
	Effectiveness and efficiency
Data Principles	Data treated as an asset
	Shared data
	Accessible data
	Data security
Application Principles	Appropriate with legislation
	Easy-to-use
	System life cycle
Technology Principles	Changes based on requirements
	Minimize redundancy and reduce duplication
	Interoperability

All of the principle in business, application, data and technology become a principal to build an architecture target that relevant with business process in 1st revenue section and make integration with another function in DPPK.

4.2. Architecture Vision

In architecture vision phase produce solution concept diagram that show the concept of solution which offers a high-level orientation of the solution that is
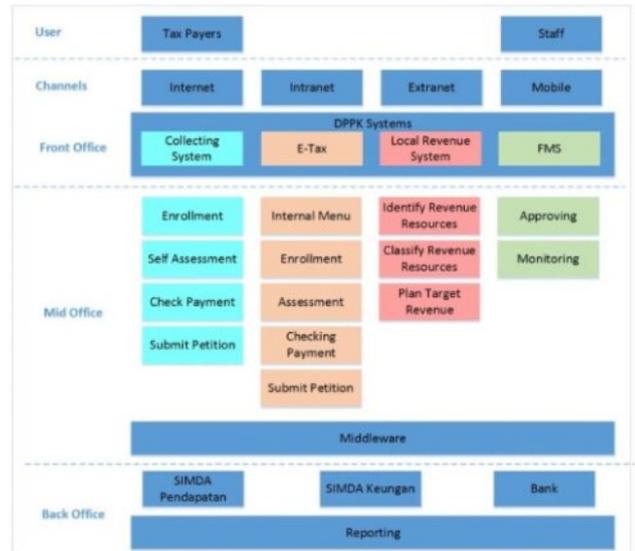
envisaged in order to meet the objectives of the architecture.

Figure 3. Solution Concept Diagram

Figure 3 describes the overview of the system to be built in 1st revenue function. The figure also described the interaction with other functions in the system that build in DPPK. The system is built in 1st revenue function is the local revenue management system and online local tax system which name collecting system.

4.3. Business Architecture

The business architecture describes the service strategy, and the organizational, functional, process, information, and geographic aspects of the business environment. A key objective in the business architecture phase is to develop a target business architecture that shows how the enterprise can achieve the architecture vision.

There are some steps to make an improvement in business perspective first step is identify the actor that interact with the system, and then identify business service that provide to customer by organizations, after that identify the interaction between main process with another business that related with the

organization, and the other important thing is identify the objectives, drivers and goals of organization, after know about the organization goals find the requirement that suitable to achieve the organization objectives. After find the requirement, identify the requirement and compare it with the business process existing in 1st Revenue section. The result can be a guideline to improve their business process and be target business architecture, after that it can produce the gap between the baseline and target business architecture. The requirement which needed to make an architecture business in 1st revenue section describe in table III

Table 3. Business Architecture Requirement

Requirement
Have a good tax administration
Have qualified tax employee
Realize expansion the tax object and subject
Have accurate and actual potential tax data
Realize of planning, monitoring and controlling of local tax revenue intensive
Have simple and clear of operational standard in easy and short time tax collection
Realize equitably tax collection
Realize using SIMDA optimally

4.4. Information System Architecture

Information system architecture describing how the organization's information systems architecture enable the business architecture and the architecture vision. To build information system architecture the organization can find the gap between the requirement and the existing information system in that organization. After get the gap, the organization can know whereas to improve the information system existing.

Table 4. Information System Architecture Requirement

Requirement
System supports all business process
System can share data
System use internet service
System use intranet/extranet service
System can be accessed anytime and anywhere
System has updated information
System provide real time information
System has high level security
System can be used in high level management

4.4.1. Data Architecture

Data architecture define the repository of key data entities that are important for organization in performing their functions. The data architecture is needed to identify the necessary information and it can use for preparing the application architecture and technology architecture.

Table 5. Data Entity Catalog

Data Entity	Type of Data
Tax	Master Data
Retribution	Master Data
Local Own Source Assets	Master Data
Local Own Source Revenue	Master Data
Tax Payers	Master Data
Calculation Tax	Transactional Data
Calculation Penalties	Transactional Data
Bank	Master Data
Payment	Transactional Data
Staff	Master Data

Table 5 describe the data that can be used in the 1st revenue section system, from the table there are master data that consist of tax, retribution, local own source assets, local own source revenue, bank and staff data. For the transactional data consist of calculation tax, calculation penalties, and payment data.

4.4.2. Application Architecture

The application architecture is architecture to define the types of major applications needed to manage the data and support the organization business functions. The application architecture that build in 1st revenue section and related with the business architecture in 1st revenue section describe in application communication diagram.
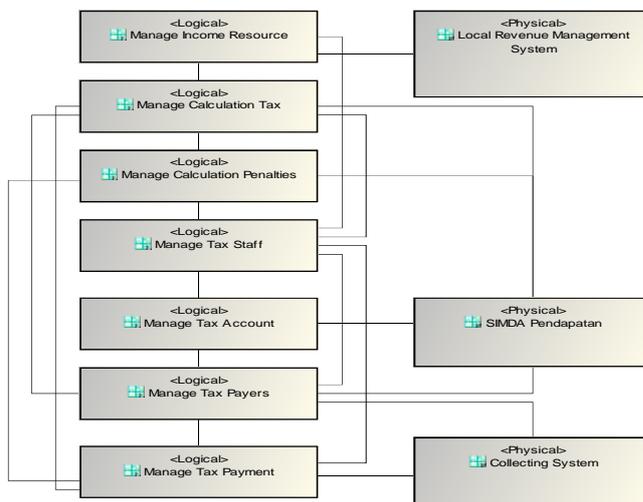

Figure 4. Application Communication Diagram

Figure 4 show the relation between logical application and physical application component. Physical application component is an application that implement in 1st revenue section. While logical application component is grouping functionality of application component.

4.5. Technology Architecture

Technology architecture means develop the target technology architecture that support the logical and physical application and data components and alignment with the architecture vision. There are steps to build an architecture technology. The first is identifying are requirement of technology, requirement is the statement that support logical and physical application target that alignment with architecture vision. The requirement be a guideline to design an architecture technology target. The design of architecture technology must be suitable with the information system architecture target to achieve requirement business that already identify.

Table 6. Technology Architecture Requirement

Requirement
Technology supports all running system
Capable to have centered storage media in a network
Have reliable security
There is distributed communication network
Technology bridges application with different platform
Technology usage based on requirement
Network connection is connected with all device
There is back-up for network
There is controlling and maintenance for technology usage

Technology architecture requirements in Table 6 will be used to design the technology used to support the system that runs in 1st revenue function. Overview of applied technology consists of a logical component of the technology and physical components.

Table 7.Logical Technology Component

Logical Technology Component	
Title	Name
Integration Application	Web Service
Database Server	SQL Server
Security	HTTPS
	VPN IP
Web Server	Apache Tomcat
Web Application Development Language	PHP
Mobile Application Development Language	Java

Table 7 describes the logical components design technology that supports information systems in 1st revenue section DPPK. Beside the logical technology component the system also support by physical technology that describe in Table 8.

Table 8. Physical Technology Component

Physical Technology Component	
Name	Product
SIMDA Pendapatan	Dell

Server	
1st Revenue Switch	Cisco
Firewall	Cisco
ISP	ASTINET

Each physical technology component in 1st revenue section not standing alone but connected with other physical technology in DPPK, the overview show by the topology in DPPK.
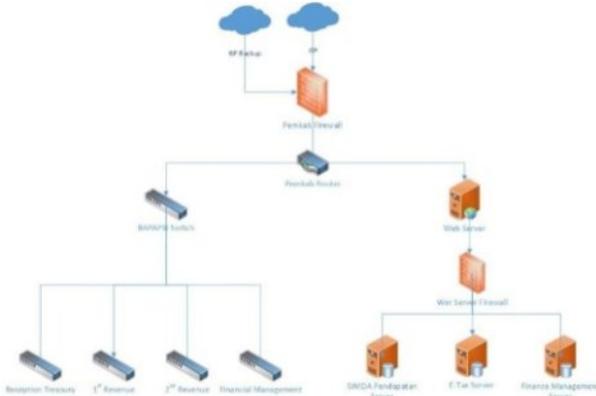

Figure 5. Topology in DPPK

4.6. Opportunities and Solution

The opportunities and solution concentrates on how to deliver the architecture. It takes into account the complete set of gaps between the target and baseline architectures in all architecture domains, and logically groups' changes into work packages within the enterprise's portfolios. Gap analysis has a function to find candidate architecture roadmap components from business architecture, information system architecture and technology architecture.

Table 9. Roadmap

Solution	2016	2017	2018
Improvement SIMDA Pendapatan	V		
Local Revenue Management System Development			V
Collecting System (Local Tax Online)Development		V	

Constructed roadmap also complement the information system strategic planning in 1st revenue function of DPPK. It can be seen through the roadmap priority when implementing the architectural design for 1st revenue function.

5. CONCLUSION AND SUGGESTION

Based on result of analysis and design architecture target in 1st revenue section of DPPK, so the conclusion can be taken are:

1. Analysis of the existing condition is required to determine the gap between the existing condition and the requirement. The gap used for design the architecture target.
2. Design architecture target covers architectural design targets within the scope of the business, data, application, and technology.
3. The design of data and application architecture target is depending on the business architecture target. Design of data and application target must be suitable with the business.
4. The design of technology architecture target is depending on the data and application architecture target. Design of technology must be support the data and application architecture.
5. Designing roadmap in five years has function to complete strategic information system planning based on TOGAF ADM Framework.

Suggestions are given based on the results of the design and analysis has been done are:

1. For DPPK organization are expected to improve their public services especially for tax services, and for 1st revenue section there is an integration between other function in DPPK. And also there is an appropriate policy within develop the information system in DPPK.
2. To further research are expected to do a research for implementing the strategic information system planning in DPPK based on TOGAF ADM Framework.

REFERENCES

(a) Jerry Mechling. (1999). Better Funding for Government IT : Views from the Front Line. Journal of the American Society for Information Science, 50(4), pp. 305-313

(b) Henk Jonkers, M. M. L. H. W. t. D. F. A. H. B. R. J. W. (2006). Enterprise architecture: Management tool and blueprint for the organisation. Springer, Volume 8, pp. 63-66.

(c) Sessions, R (2007). A Comparison of the Top Four Enterprise-Architecture Methodologies. ObjectWatch, Inc..

(d) Peppard, J. W. &. J.(2002). Strategic Plaanning for Information System. 3rd ed. Chichester: John Willey & Sons.

(e) Robert Winter, E. J. S. (2007). Enterprise Architecture. Springer-Verlag .

(f) The Open Group. (2011).TOGAF version 2011. The Open Group 2011.