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Information System Architecture Planning Using Togaf Architecture Development Method

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Abstract:
The purpose of this research is to develop an existing information system by designing a service, planning, and reporting system in the Cimahi City Revenue Management Agency Identification Sector. The method used is TOGAF-ADM so that it is more flexible in verifying various types of modelling techniques used in designing information systems. The steps implemented in this design are TOGAF ADM, including Preparation, Vision Architecture, Business Architecture, Information Systems Architecture, and Technology Architecture. Output from this stage will produce an enterprise architecture that can later be used by organizations to support business processes and achieve strategic goals. The results of the analysis of the application of the TOGAF ADM method are in the form of Company Architecture modelling which provides guidance in the development of information systems in the future in the Field of Identification of the Revenue Management Agency of Cimahi.

Keywords: Information System, TOGAF, Management Architecture

INTRODUCTION

The rapid development of information technology has an impact on the use of information technology on a large scale by companies and institutions in order to improve organizational performance. Information technology is not only expected to be a tool for organizational operations but also has become a strategic part of the organization to achieve its objectives. The application of this technology must be prepared in such a way that information technology can help institutions to move towards the vision and mission that has been described (Riyanto, Lidya, Nurchayo, 2016). The implementation of public activities and services at the Cimahi City Revenue Management Agency requires information and communication technology as a supporting tool. The use of information technology at the Cimahi City Revenue Management Agency is currently in the stage of using office applications, such as in carrying out office administrative tasks.

Aligning the application of information systems with the need for institutions can only be answered by taking into account the integration factors in its development, the real purpose of integration is to reduce the gaps that occur in the system development process and also to facilitate the exchange of data between existing applications. Hence, we need a paradigm in planning,

designing, and managing information systems called enterprise architecture. Enterprise architecture is a logical, comprehensive, and holistic approach to design and implement systems and system components simultaneously. Various types of paradigms and methods can be used in the development of corporate architecture models, including TOGAF ADM, Zachman Famework, EAP, and others (Kurniawan, Rosidi, Fatta, 2018).

The company's architectural design is intended to provide a blueprint and proposal or work platform to the Cimahi City Revenue Management Agency so that it can provide better services to the public and make it easier for leaders to obtain information about taxation. Therefore, this research will develop enterprise architecture planning using the TOGAF ADM development methodology. Where the output that can be achieved from the enterprise architecture model is to produce a blueprint for developing integrated information systems to support the needs of the institution (Svee, Zdravkovic, 2015).

RESEARCH METHOD

The research methodology contains the stages of research carried out that refers to the framework of The Open Group Architecture Framework (TOGAF), which is an architectural framework in an agency that provides a comprehensive approach to design, planning, implementation, and governance of information systems and information technology architecture. The stages of research carried out in the design of Enterprise Architecture (EA) at the Cimahi City Revenue Management Agency are as shown in Figure 1 (Sasmito, 2013).

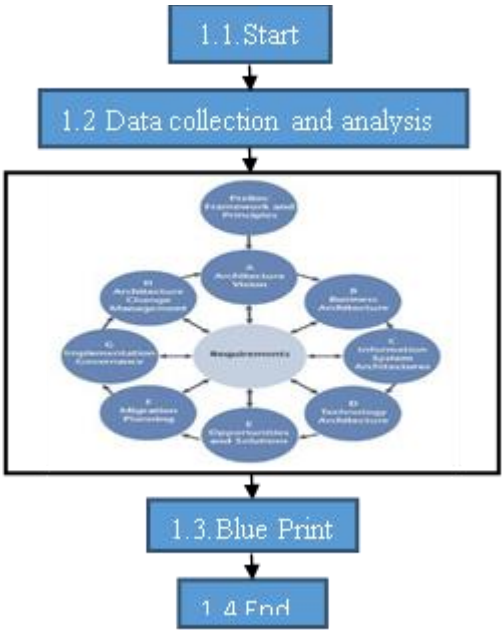

Figure 1. Stages of Enterprise Architecture Design Research (EA) at the Cimahi City Revenue Management Agency

Based on the research stages in Figure 1, the research stages can be explained in more detail as follows: The first stage is data collection and analysis, at this stage data collection is done through interviews, observations, and study documents at the Regional Revenue Management Agency of Cimahi City. In the process of collecting data, it is obtained from direct observation is the problem and the current state of the Cimahi City Revenue Management Agency. The data is obtained from the question and answer with the Head of the Agency and employees at the Cimahi City Revenue Management Agency. After the data is collected, an analysis and data processing is carried out, so that the results of the data processing can be used for the Enterprise Architecture design process [5]. The next stage is to enter the TOGAF framework where the steps in this framework can be described as follows (Kasenda, Nugroho, Sulistyo, 2014):

- Preliminary phase: this phase determines the framework and scope of the Corporate Architecture (EA) to be developed as well as the definition of management elements, in which the architecture and organizational team is formed in the Revenue Management

Agency.

- Phase A. Vision Architecture: this phase allows defining the scope of the foundation architecture effort, creating the vision architecture supporting requirements and constraints and obtaining approvals to proceed.
- Phase B. Business Architecture: this phase enables developing the detailed business architecture for analyzing the gaps results.
- Phase C. Information System Architecture: This phase stage determines the data architecture and application architecture. The data architecture focuses more on how the data is used for the needs of business functions, processes and services. The application architecture places more emphasis on how the application needs are planned.
- Phase D. Technology Architecture: This phase enables developing a technology infrastructure that is used as a foundation for identifying all components that will support the development, implementation and deployment processes

In the research conducted at the Revenue Management Agency, the stages carried out in the TOGAF framework are starting from phase A (Architecture Vision) to phase D (Technology Architecture) because the focus in research is on how data is used for the needs of business functions, processes and services as well as how the application needs are planned. The final stage in this research is in the form of a product or recommendation blue print of the Information System.

RESEARCH RESULTS AND DISCUSSION

Based on observations and interviews, it can be seen that in the Cimahi City Revenue Management Agency Identification Sector, there is no blueprint for designing information systems architecture that will support business processes and still use manual processes. When making a corporate architecture blueprint, it will use TOGAF ADM. The following are the steps: (Qurratuaini, 2017).

- *Preliminary Phase*

The preliminary phase is the stage to determine the scope of Enterprise Architecture (EA) to be developed and determine the commitment with management in the development of information systems architecture (Fitriani, 2016). This phase explains the preparation and initiation of EA, including the definition of organizational identification, organizational goals, and organizational models for EA and architectural principles. Cimahi City Revenue Management Agency is a supporting element of Government Affairs in the field of financial sub-affairs of revenue which is the regional authority. With the function as an organization tasked with increasing regional tax revenue and realizing coordination with other regional producing instruments in the management of regional income. The Revenue Identification Sector - is responsible for carrying out services to taxpayers in an excellent manner and carrying out income planning.

The principle of architecture is the basis for the development of Enterprise Architecture. The architectural principles developed consist of business principles, data principles, and application of technology principles. The results of the study of documents and strategic planning interviews can be identified as follows: prescribed business principles will make professional employees coordinate revenues and increase local tax revenue.

The data principles consist of data assets, shared data, accessible data, and data security. The principles of management of technological change consist of responsiveness and interoperability (http://www.opengroup.org/togaf),. One of the successes of corporate architecture planning is management commitment. The intended management commitment is related to policies in each process or activity carried out at the Revenue Management Agency and policies related to the application of information technology.

- *Phase A Architecture Vision*

In this architectural phase of vision, the management needs are identified as represented in the vision and mission, organizational goals, scope, organizational structure, identifying stakeholders, and describing the current system conditions. Defining an architectural vision is an important step

for analyzing an organization's value chain. The results show a value chain analysis that includes domain and business functions and supports core business functions in organizations. Value analysis based on Michel Porteris grouped into 2 activities, namely primary activities and support activities, such as Figure 2.

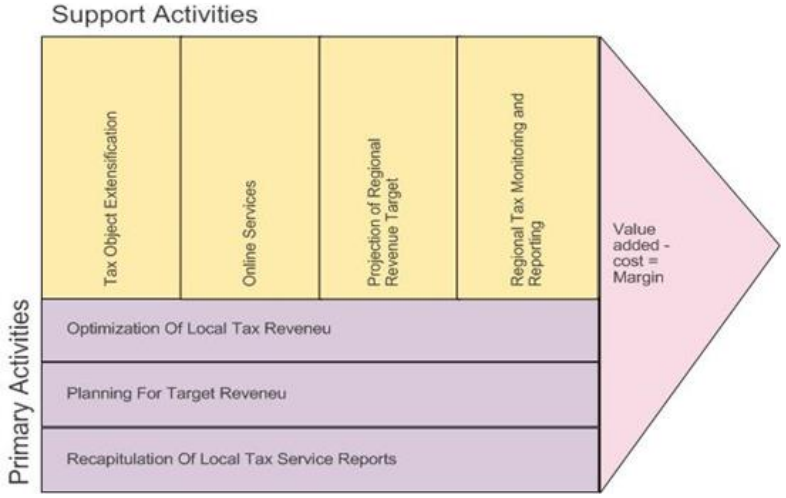

Figure 2. Analysis of the Value Chain Identification Sector of the Revenue Management Agency

Figure 2 is the main activities consist of: Optimization of Local Tax Revenues (OLTR), Planning for Targeted Revenues (PRT), and Recapitulation of Local Tax Service Reports (RLTSR). Whereas Supporting Activities consist of Tax Object Extensification (TOE), Online Services (OS), Projection of Regional Revenue Target (PRRT), and Regional Tax Monitoring and Reporting (RTMR). Where each stakeholder has a relationship between each other in every service contained in the value chain analysis. The identification of stakeholders involved in this taxation information system is shown in figure 3.

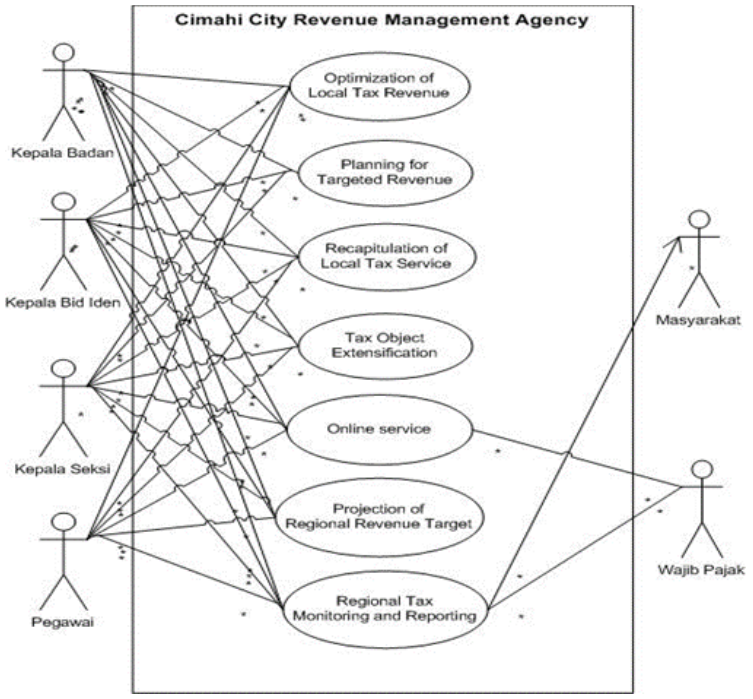

Figure 3. Use Case Diagram of Stakeholder Identification in the Cimahi City Revenue Management Agency identification area

- *Phase B Business Architecture*

This phase discusses the current conditions of business process activities carried out at the Cimahi City Revenue Service Identification agency, and propose improvements to business processes by modeling business architecture.

- *Current Business Process*

The core business process of the Cimahi City Revenue Service identification area is providing Regional Tax services, expanding new tax objects, and recapitulation of Local Tax Service Reports. Based on direct observation, people who will pay taxes must come directly to the revenue management agency, especially in the area of identification. The core business process of the Cimahi City Revenue Service identification area is providing Local Tax services, expanding new tax objects, the recapitulation of Local Tax Service Reports. Based on direct observations, people who will pay taxes must come directly to the revenue management agency, especially for office appraisals (advertising taxes) and self-assessments (restaurants, hotels, entertainment, street lighting, and parking taxes). Likewise for leaders in the revenue management agency, if they need a report on the results of the tax service, they must look to the tax service system themselves or request a printout from the employee in charge.

- *Proposed Improvement*

The proposed improvement is based on the business processes currently carried out by the Cimahi City Revenue Management Agency Identification Division by creating a business model that can describe the business functions of an enterprise. The thing done in business modeling is to identify the model business where the main business model and supporting a business model in an enterprise (Rusli, Yohanes, 2017). Moreover, it is obtained that defining this business process using the porter's value chain as shown in figure 4.

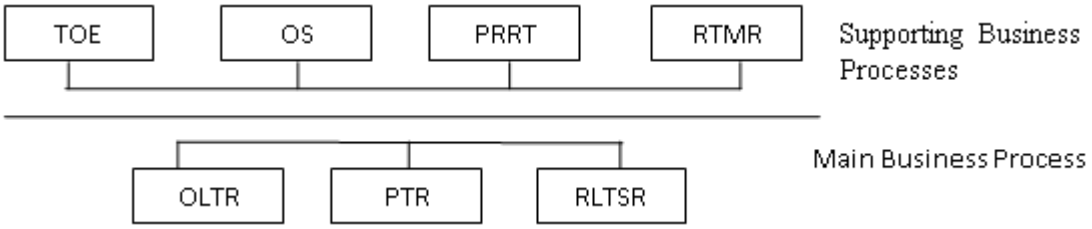

Figure 4. Business Architecture Identification of Cimahi City Revenue Management Agency

- *Phase C Information System Architecture*

In the Information System Architecture phase, it will describe several aspects of an enterprise, which include the depiction of data architecture, applications, as well as application proposals and mapping for each business function in the Cimahi City Revenue Management Agency Identification (Goepp, Petit, 2017) (See Table 1).

Table 1. Current Data Collection

Business Entity	Data Entity
Optimization of Local Tax Revenue	1.Amount of Taxpayer data 2 data of taxpayers who pay by ATM
Planning for Targeted Revenue	1.realization data 2.taxpayer data 3.potential tax object data 4.Data behavior of taxpayers
Recapitulation of Local Tax Service Reports	1.tax service data 2.tax receipt data 3.tax type data 4.requirements
Tax Object Extensification	1.tax object data 2.tax period 3.payment date 4.tax object data that has been paid
Online Services	1.Turnover reporting 2.application file 3.applicant data
Projection of Regional Revenue Target	1.realization data 2.taxpayer data 3.potential tax object data
Regional Tax Monitoring and Reporting	1.realization data 2.type of tax 3.taxpayer data 4.target data 5.ignition percentage 6.quarterly revenue data

2.

Application Architecture

The existing information in the field of Identification of the Cimahi City Revenue Management Agency already exists that uses applications in the operation of its work but some are not yet. The data storage is still stored in several places, in different applications so that it can be difficult to be able to provide information quickly and accurately. There are some information processing activities still processed manually using data processing applications such as Ms. Word and Ms. Excel. Meanwhile, other programs or applications have not yet been used to support the activities carried out, such as tax payment applications and also the United Nations Tax and BPHTB monitoring applications which, if any, are used will be able to assist the activities carried out.

Table 2. Application Portfolio Revenue Management Agency

Application Code	Application Solution
AP-1.1	1.1 SKP delivery application online
AP-2.1	2.1 Target planning application
AP-31	3.1 Regional tax dashboard
AP-4.1	4.1 Potential regional tax application
AP-5.1	5.1 Online service application
AP-6.1	6.1 Tax targeting application
AP-7.1	7.1 Monitoring and reporting application

The portfolio application contains a list of applications that have been identified based on each business activity. Application solutions from the Cimahi City Revenue Management Agency can be mapped into business architecture as shown in Figure 5.

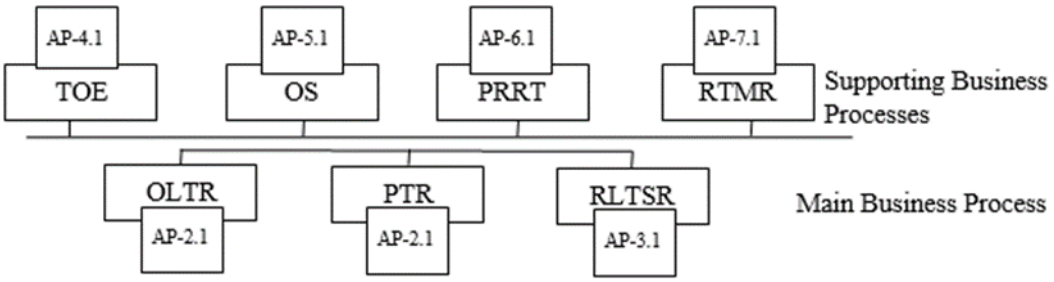

Figure 5. Architecture of Business Process Application in the Field of Identification of Cimahi City Revenue Management Agency

- *Phase D Technology Architecture*

This phase aims to make a technology platform proposal related to the needs of integrated information systems in the Cimahi City Revenue Management Agency. This stage determines the application and data distribution strategy as well as defining the technology platform that will be the environment for applications and data that will support the functions of existing activities at the Cimahi City Revenue Management Agency. Details of the proposed technology platform for application development are shown in Figure 6.

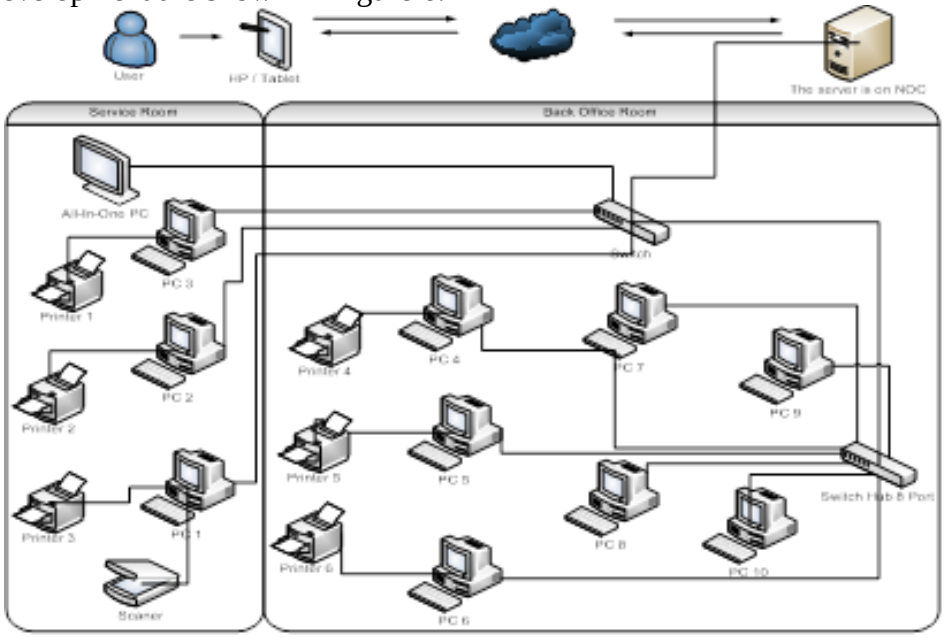

Figure 6. Proposed Technology Platforms

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CONCLUSION

The results of the design of enterprise architecture with TOGAF ADM to create a blueprint that can be used as a guide or reference in the development of information technology both in terms of information systems and applications in terms of improving services to the community for the Cimahi City Revenue Management Agency Identification. By using the TOGAF ADM method, the process of making a blueprint can produce a business model, data architecture, and technology architecture, as well as the technology proposed for each of its models. The blueprint resulting from the modeling of company architecture using the TOGAF ADM method is detailed and integrated planning starting from the business architecture, data, applications, and technology of a company.

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