

# ANALYSIS AND DESIGN ENTERPRISE ARCHITECTURE OF DEVELOPMENT ANALYSIS BUSINESS FUNCTION AT BADAN PERENCANAAN DAN PEMBANGUNAN DAERAH (BAPPEDA) WEST JAVA PROVINCE USING TOGAF ADM FRAMEWORK

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## ABSTRACT

*Badan Perencanaan dan Pembangunan Daerah (Bappeda) is a government agency with focus on development planning. As the agency planning, Bappeda is expected to produce the quality of planning and has reliability, measurability and accountability. It can be reached through the information technology that is used by Bappeda through UPTB Pusdalibang for processing data development and developing analysis development result. This is used as a recommendation for development planning. In addition, UPTB Pusdalibang implementing dissemination of data development periodically in accordance with the regional legislation, so that Bappeda need to develop new business strategy. Enterprise Architecture is a method for designing requirement information technology compared to Bappeda's need. TOGAF ADM can be used as the framework for designing enterprise architecture. Phase Architecture Vision to Opportunities and Solutions is implemented in this study which produces artifacts that can be used as the basis of development information technology in Bappeda especially for business function analysis development.*

*Key words: Enterprise Architecture, TOGAF ADM, analysis development*

## 1. INTRODUCTION

Badan Perencanaan dan Pembangunan Daerah in West Java or later stated as Bappeda, is a government agency that develops and implements regional policies in the field of planning and development regional. To get the quality of development planning, one of the priority programs of the future is database that contain data and information of development. This will provide convenience for Bappeda and other development stakeholders to access, search and use data and information development as input in the development planning process.

In accordance with Tupoksi (*Tugas Pokok dan Fungsi*) of Bappeda, UPTB Pusdalibang is a field of Bappeda who conducted the analysis of development. The challenge is how to collect data development from different data source like OPD (*Organisasi Perangkat Daerah*), regional Bappeda, including Bappeda district/city, and BPS (*Badan*

*Pusat Statistik*). The problem is data collected does not meet the needs of Bappeda. In addition, data collection is not in accordance with the data collection period. Furthermore, the collected data are analyzed/processed and displayed as information to the public. Data and information dissemination is in accordance with the Local Regulation No. 24 in 2012 on Satu Data Pembangunan, Bappeda implemented data dissemination both printed and electronic media. In order to facilitate the data processing, data analysis and data dissemination, that can take the advantage of information technology. The utilization of information technology must be aligned with business needs so that necessary for Bappeda to build enterprise architecture especially for development analysis business function. The key success factors in the design of an organization's enterprise architecture is the selection of the appropriate enterprise architecture framework. Therefore, TOGAF is chosen as the

architectural framework. From each phases of the TOGAF ADM will produce artifacts in the form blueprint of Business Architecture, Data Architecture, Application Architecture, Technology Architecture and IT Roadmap. The Blueprint will be used as the basis for the development of information technology in the development analysis business functions in Bappeda.

## 2. THEORETICAL BACKGROUND

### 2.1 Enterprise Architecture

TOGAF defines enterprise as any collection of organization that has a common set of goals. Enterprise could be a government agency, a whole corporation, a division of a corporation, a single department, or a chain of geographically distant organizations linked together by common ownership. Enterprise Architecture is a coherent whole of principles, methods and models that are used in the design and realisation of an enterprise organisational structure, business processes, information systems, and infrastructure.

### 2.2 The Open Group Framework (TOGAF)

The Open Group Architecture Framework (TOGAF) is a framework for developing Enterprise Architecture that can be used freely by any organization wishing to develop an enterprise architecture. TOGAF provides detailed methods and tools to assist in the process of acceptance, production, use and maintenance of an enterprise architecture.

### 2.3 Architecture Domain of TOGAF

There are four architecture domains that are commonly accepted as a part of the overall enterprise architecture supported by TOGAF:

- a. The Business Architecture defines the business strategy, governance, organization, and key business processes.
- b. The Data Architecture describes the structure of an organization's logical and physical data assets and data management resources.

- c. The Application Architecture provides blueprint for the individual application to be deployed, their interactions, and their relationships to the core business of the organization
- d. The Technology Architecture describes the logical software and hardware capabilities that are required to support the deployment of business, data, and applications services. This includes IT infrastructure, middleware, networks, communications, processing, standards, etc.

### 2.4 TOGAF ADM

The TOGAF Architecture Development Method (ADM) is a logical methodology consisting of eight major phases for the development and maintenance of the organization's technical architecture. ADM forms an iterative cycle that allows organizations to transform their enterprise in a controlled manner in response to business goals and opportunities.

TOGAF ADM consists of eight major phases as follows:

1. The Preliminary phases
2. Phase A : *Architecture Vision*
3. Phase B : *Business Architecture*
4. Phase C : *Information Systems Architectures*
5. Phase D : *Technology Architecture*
6. Phase E : *Opportunities and Solutions*
7. Phase F : *Migration Planning*
8. Phase G : *Implementation Governance*
9. Phase H : *Architecture Change Management*
10. Phase *Requirements Management*

## 3. RESEARCH METHOD

Some steps is required to resolve the issue of this research for analysis and design enterprise architecture at development analysis business function. These quickly and orderly steps are illustrated through the conceptual model in Figure 1. Research will focus on ADM phases that is started in Preliminary phase until Opportunities and Solutions. Data and information that is needed as an input in this research are vision and mission of Bappeda, Strategic Plan in 2013-2018 documents of Bappeda, and an overview of business conditions and

IT of Bappeda especially development analysis business function. After that, the input will be processed that is started from the Preliminary Phase, Architecture Vision, Business Architecture, Information Systems Architecture include Data Architecture and Application Architecture, Technology Architecture, and Opportunities and Solutions. At each phases will produce an artifact as a results, such as catalogs, matrices and diagrams is tailored to TOGAF. Furthermore, after analysis, the artifacts will be form as a blueprint of Business Architecture, Data Architecture, Application Architecture, Technology Architecture, and IT Roadmap.

**4. RESEARCH AND DISCUSSION**

**4.1 Preliminary Phase**

In the preliminary phase will be defined principles in designing the enterprise architecture. Table 1 shows the principles catalog for designing enterprise architecture of development analysis business function in Bappeda. Defining the design principles are based on the principle of development of West Java and Bappeda’s needs in developing their respective architecture.

*Table 1. Principles Catalog*

Domain Architecture	Architectural Principle
Business Architecture	<ul style="list-style-type: none"> <li>- Compliance with Law</li> <li>- Service Orientation</li> <li>- IT Responsibility</li> <li>- Development continuity</li> <li>- Equitable justice</li> <li>- Stability if steady</li> </ul>
Data Architecture	<ul style="list-style-type: none"> <li>- Data integration</li> <li>- Data is accessible</li> <li>- Data is shared</li> <li>- Data security</li> <li>- Data is an asset</li> </ul>
Application Architecture	<ul style="list-style-type: none"> <li>- The right of access to use application</li> <li>- Ease of use</li> <li>- Chanes as needed</li> </ul>
Technology Architecture	<ul style="list-style-type: none"> <li>- Technology security</li> <li>- Interoperability</li> </ul>

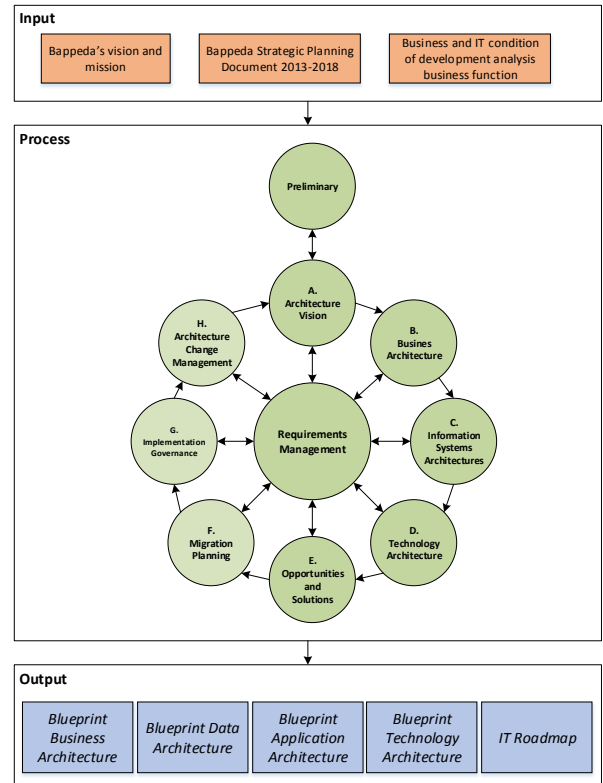


Figure 1. Conceptual Model Research

**4.2 Architecture Vision**

Phase Architecture Vision produces Value Chain diagram as artifact that map the entire work process that occurs in Bappeda. Set of activities consist of two categories of activity is the primary activities and supporting activities. Based on the value chain analysis diagram on Bappeda, development analysis business function includes the process of collecting development data and information, data processing, the preparation of the results of the analysis of the development that is used as recommendations for development planning in making and evaluating the policy and information services for those who require data, information and results of development.

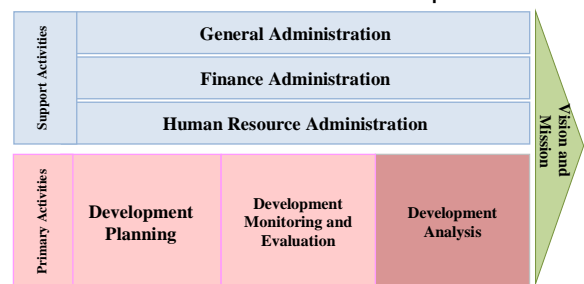


Figure 2. Value Chain Diagram

### 4.3 Business Architecture


Based on the value chain analysis diagram and goals and objectives of the organization, business requirement of development analysis business function will be defined, as follows:






1. Involvement of all stakeholders of development
2. The availability of development data and information
3. Implementation Forum Data
4. The presence on the analysis of development
5. Develop Satu Data Pembangunan

To meet the business needs required the definition of business process at development analysis business functions. Business Process Diagram on Figure 3 shows the analysis of business processes in high-level. Channeling and executing business process needs development data from data source as an input that is used for data processing. Verification of this data will be conducted by Data and Analysis Section. The result of this will be informed to the data source. Forum Data is another ways that is used by Bappeda for data collection. Each data source will get an invitation to attend Forum Data and they should confirm by sending a reply letter. Development data collected will be processed and then analyzed to produce a analysis of development document. Data and Information Services Section together with Data and Analysis Section will conduct publication via print or electronic media. Bappeda through UPTB PUSDALISBANG also provides for stakeholders who needs data, information, and analysis results. Feedback service is obtained from the complainant that the public and will be processed by Data and Analysis Section to produce a report on the analysis of feedback.

The decomposition of business processes of the business functions will generate business services. Explanation of each business service in the development analysis business function can be seen in Table 2.

*Table 2. Business Services*

Business Services	Description
 Development data collecting	Collecting data from data source such as OPD, Bappeda district /

Business Services	Description
 Forum Data Management	city and community. Manage Forum Data
 Analysis of data development	Formulate recommendation for development policy in West Java.
 Development information services	Data and information services either directly or indirectly
 Publication of the analysis result	Data dissemination via electronic and print publications.
 Feedback services	Collecting feedback from the public related to regional development.

### 4.4 Information System Architecture

Information System Architecture is divided into two parts, namely the data architecture and application architecture. Data Architecture describes how the use of data for the needs of the organization in supporting the existing business processes. The application architecture describes what services are needed to process the data. Applications that will be developed at a business function analysis is Satu Data Pembangunan and one-Gov Bappeda. Table 3 shows the functionality of each application that will be used on development analysis business function.

*Table 3. Application Portfolio Catalog*

Logical application component	Physical application component
Development data collection	Satu Data Pembangunan
Development data management	
Management of analysis results	
Data and information services management	
Feedback management	
OPD data collection report	one-Gov Bappeda
Information services reports	
Feedback report	

Logical application component	Physical application component
Information of RTS (Rumah Sasaran) Show information indicator Show information of poverty data, the potential of the village, population and spatial Show information of OPD data collection	KM 0 Pro Poor Statplanet Kabupaten/Kota Geodatabase Simpul jaringan

**Data Dissemination Diagram** is a diagram illustrates the relationship between data entities, logical application component and business services. Figure 4 shows data needs for each logical application on the application One data and one-Gov Bappeda Each logical application that supports business services that is contained in Bappeda are publication of analysis result, development data collection, Forum Data management, feedback service, and development information services.

**Application Communication Diagram** is used to know the model that is mapping

communication between applications as metamodel entities. Application Communication diagram in Figure 5 shows the relationship between logical and physical application, and between logical application component. This application communication diagram show the communication between Satu Data Pembangunan and One-gov Bappeda, RKPD Jabar Online and e-Money that is used by other business functions in Bappeda, namely development planning and development monitoring and evaluation. In addition, there is also describes communication with an external application from outside organization is Siskurtannas.

**Application and User Location Diagram** shows deployment location application usage. Figure 6 shows the applications that are used by business function/ There are Satu Data Pembangunan, KM 0 Pro Poor, Geodatabase, StatPlanet Kabupaten/Kota, dan Simpul Jaringan. These can be accessed by Data and Analysis Section, Service Section of data and information, OPD, Bappeda District/ City and the public.

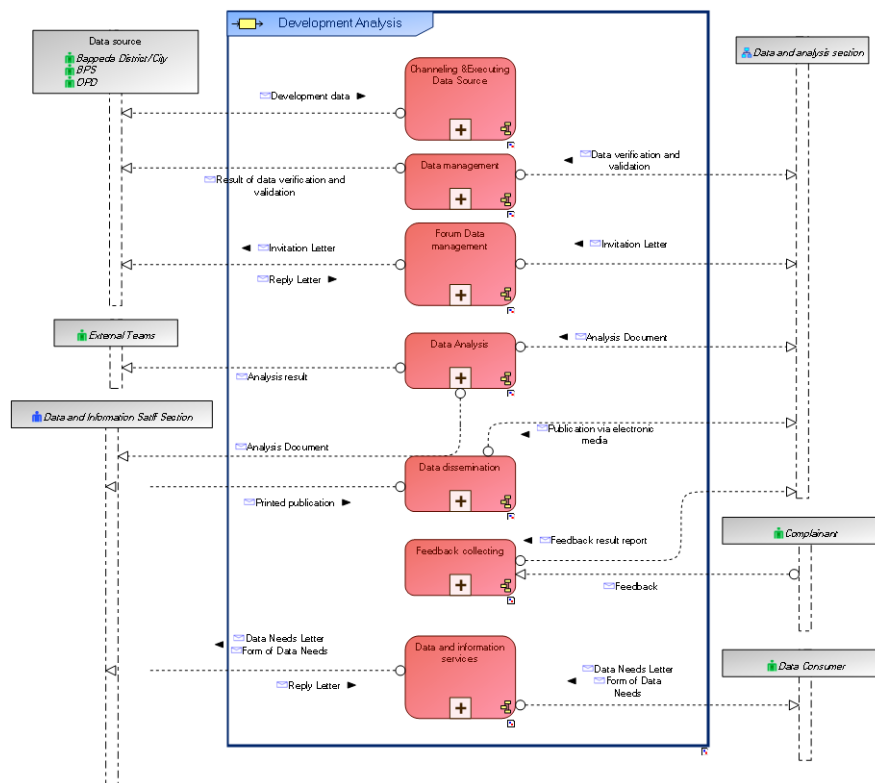


Figure 3. Business Process Diagram for analysis development business function

### 4.5 Technology Architecture

Phase Technology architecture describes the technology architecture targets to be applied in Bappeda. Environments and Location diagram illustrates the location of the use of technology or application so that it can be seen from the location where business users typically interact with the application. Figure 7 explains how users access applications through a web client will connect to the switch. Then, from the

switch are connected to the router to access the application server of each application. Application servers are supported by the database server that store data application. To be able to access the application, network both in UPTB Puskalisbang and Bappeda office are connected to WAN Pemprov Jabar. To maintain security in accessing existing applications is implemented firewall.

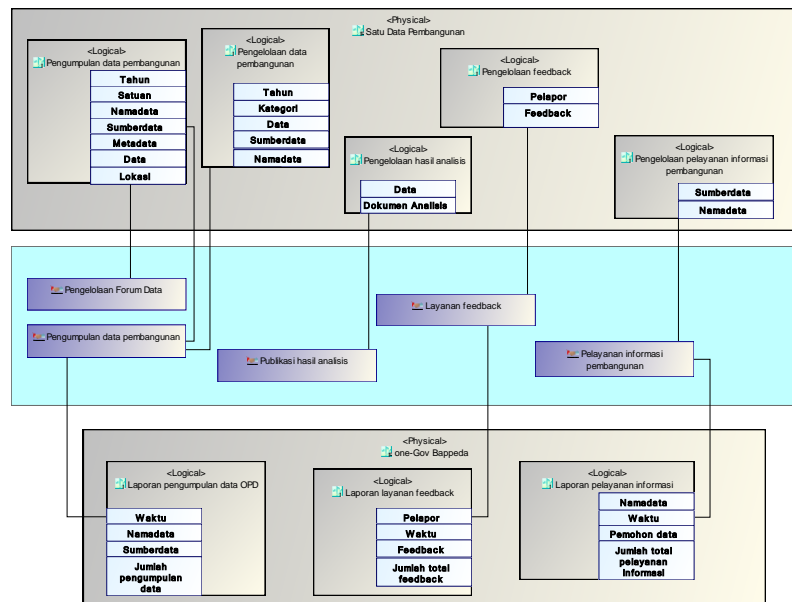


Figure 4. Data Dissemination Diagram

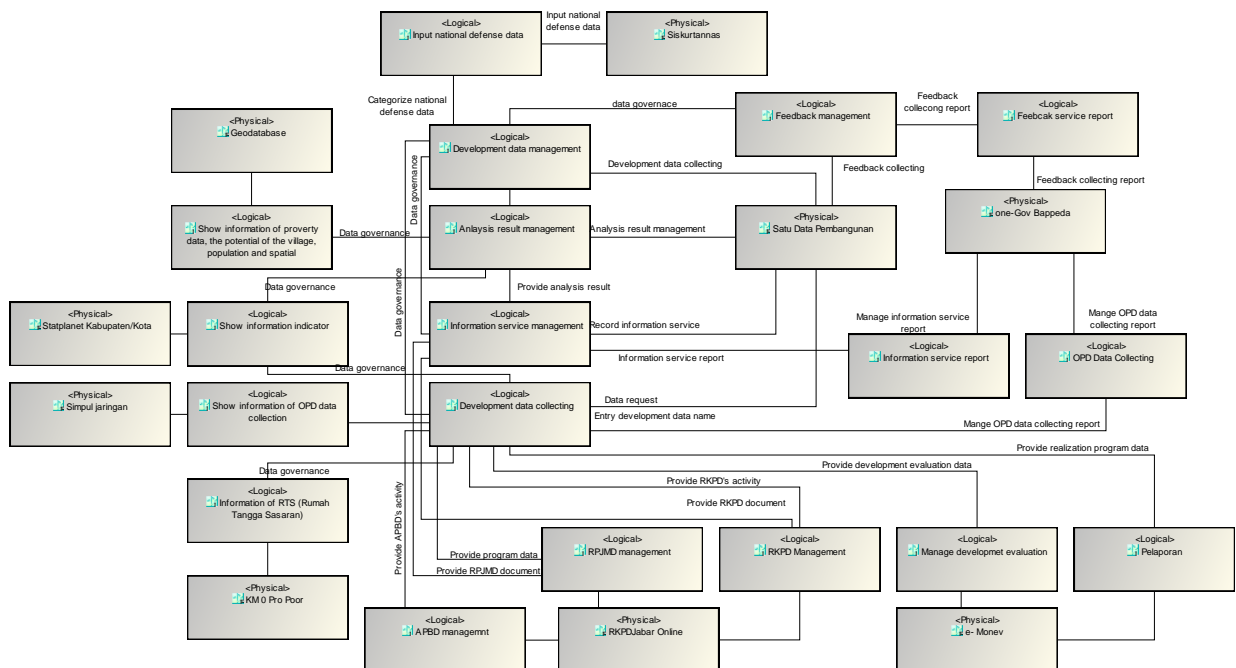


Figure 5. Application Communication Diagram for analysis development business function



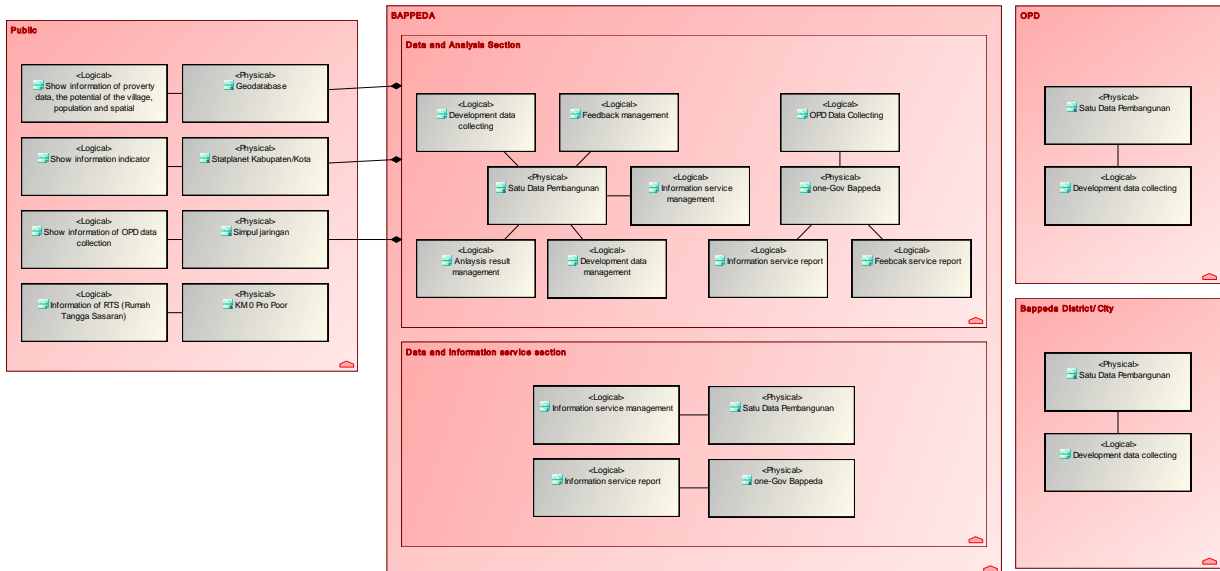
4.6 Opportunities and Solutions

Phase Opportunities and Solutions resulted a recommendation for Bappeda activities to develop IT. Activities are grouped by year implementation of activities for the next two years. Priority determination in IT Roadmap is based on an analysis of the effort and the benefits of each proposed activity. Table 4 lists the activities of the IT Roadmap for Bappeda.

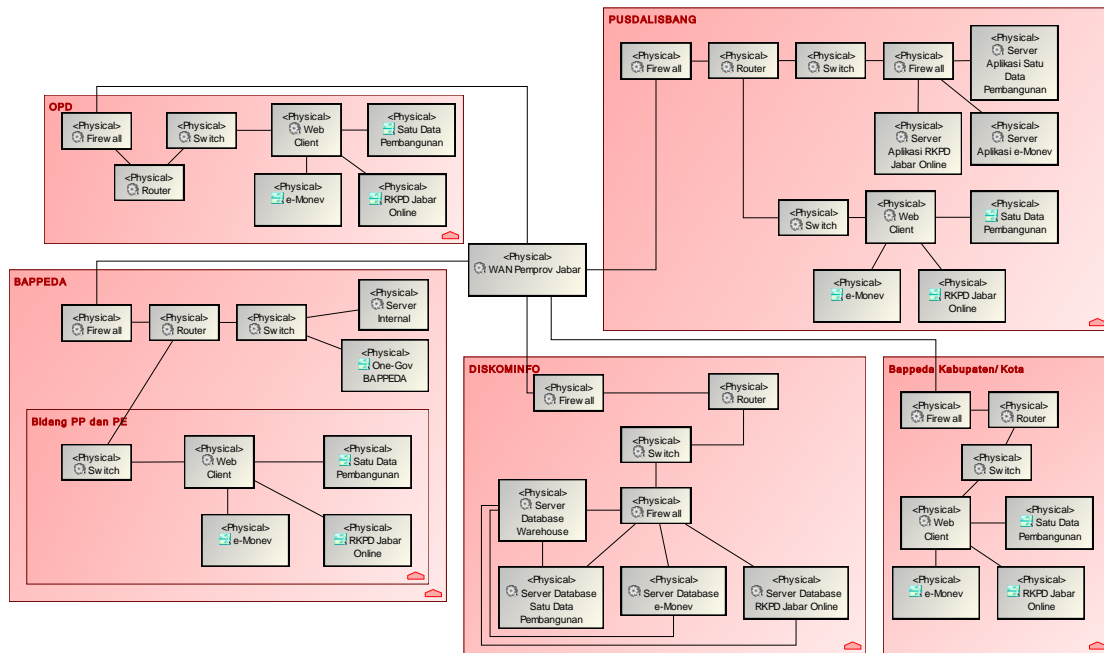
Based on Table 4, the proposed activities related to business functions analysis of development is develop one-Gov Bappeda, and Satu Data Pembangunan, implementation procedure of data dissemination and Forum Data, and strengthening IT Network.

Table 4: IT ROADMAP Bappeda

Year	Activity
Year 2017	- Develop one-Gov Bappeda
	- Repair IT Network (implementation of firewall, monitoring and maintenance of IT)
Year 2018	- Develop RKPDJabar Online
	- Develop e-Monev
	- Develop Satu Data Pembangunan
	- Create procedure of Musrenbang Management
	- Create procedure of mid-term RPJMD evaluation
	- Create procedure of data dissemination
	- Create procedure of Forum Data
- Repair information network (implementation of firewall, monitoring and maintenance of IT)	



Gambar 6. Application and User Location Diagram for analysis development business function



Gambar 7. Environments and Location Diagram Bappeda

## 5. CONCLUSION

Based on the analysis and design of enterprise architecture that has been done, the conclusions of the study are produced blueprint in the form of artifacts from each phase of the TOGAF ADM. Changes to the existing business architecture is the addition of business process management and documentation of the Forum Data, data dissemination, data and information services, and gathering feedback. Development of application architecture is the addition of application modules of Satu Data Pembangunan and one-Gov Development Bappeda In addition there is implementation of firewall in technology architecture for each network in the Bappeda. In addition, the results of the design of the Phase Opportunities and Solutions in the form of IT Roadmap which contains activities that can be done by Bappeda in conducting IT development over the next two years.

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