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Enterprise Architecture Design of Local Government Using OADP(Oracle Architecture Development Process) Case Study: Regional Government of Garut Regency

Yopi Nugraha[1]; Galih Abdul Fatah Maulani[2] ; Ai Didah Amalia [3] ; Acep Sandi Mutia [4] ;
[1,3,4]*Institut Pendidikan Indonesia Garut*
Jalan Terusan Pahlawan No.32 Sukagalih Tarogong – Garut, Indonesia
[2]*Universitas Garut*
Kampus 4 Universitas Garut, Jalan Terusan Pahlawan Tarogong – Garut, Indonesia
yopi@institutpendidikan.ac.id

***Abstract*– Garut Regency Regional Government is one of the non-profit organizations that has long utilized information systems and information technology. However, currently, many information systems fail to be implemented due to various reasons. These failures are measured in percentages of 35% total failure, 50% partial failure and 15% success, Judging from the statistical data of the district assessment of the best SPBE implementation in 2022, Garut Regency is not included in the index, meaning that the Garut Government is still below the top 10 of the overall index average. From the various exigencies found, this research was conducted to produce an Enterprise Architecture design using the Oracle Architecture Development Process as a way to facilitate the alignment of business strategies with Information Technology strategies and their implementation. To achieve the research objectives, the Oracle Architecture Development Process method approach is used in which there are several design phases in the form of vision architecture, current state architecture, future state architecture, strategic roadmap, architecture governance, and business cases. So that a blueprint is produced with four main components of architecture, namely business architecture, data architecture, application architecture, and technology architecture which are adjusted to the goals and business processes of the Garut Regency Government. And produced nine recommended applications to support government public service activities, and produced an IT Roadmap that is used to assist in implementing enterprise architecture design and integrating business processes and Government applications. The results of this study are expected to be used as a comparison and guide for the Garut Regency Regional Government in developing information technology in applications, data, and technology, it is hoped that further research will design the business case phase so that the proposals given can be implemented by the Garut Regency Regional Government as a whole.**

Keywords- Government Enterprise Architecture, Oracle Architecture Development, Blueprint, Roadmap Strategy.

I. INTRODUCTION

Regional Government of Garut Regency is a non-profit organization which is a regional government institution that has long utilized IS/IT, but this utilization has not been optimally used because in its business activities it still has several deficiencies related to data management which should be can be accommodated with the support of adequate technological infrastructure[1], [2]. This happens because there is no accelerating infrastructure adjustment with human resources. The Regional Government of Garut Regency currently does not yet have an enterprise architecture design for strategic alignment of information systems or information technology and strategic activities that can be used as a reference for Regional Work Units (SKPD)[3]. In the potential for service synergy, for example information technology services have not been carried out. As a result, many organizational business process activities are still carried out manually, resulting in ineffective and efficient government performance processes which in this case will certainly have an impact on the public services provided, including the long service processing time[4], [5].

e-government implementation, which is then called the Electronic Based Government System (SPBE) does not always run smoothly and as expected. Many information systems fail to be implemented due to various reasons. Challenges to e-government implementation can lead to failure. Furthermore, the failure is measured through the percentage that is 35% totally failed, 50% partially failed and only 15% reaped success[6].

The lack of careful planning for the implementation of IS/IT is one of the main causes of the failure of an organization in implementing IS/IT[7]. This strategy design document serves as a reference in investing in information systems and information technology[8]. Without a clear design, the IS/IT investment that is to be made will run aimlessly and will provide a contribution that is not optimal and is not aligned with the goals desired by the organization. There are 5 (five) dimensions and 20 (twenty) indicators, 8 (eight) evaluation models and 3

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(three) evaluation focuses, as factors causing the failure of e-government implementation in the application of IS/IT in government environments[6].

II. LITERATURE REVIEW

Design is a means of transforming perceptions of environmental conditions into meaningful plans that can be implemented regularly[9]. In general, the design aims to provide a complete and complete description of the system formed, designed, and sketched to the programmer or user (users). Design is the first step in the system or product engineering development phase. Enterprise Architecture is an evaluation and description of human aspects, processes, and resources in an organization, and is also a form of activity that enables organizations to build the foundations needed for survival of the organization and to face business challenges in the future[10].

The scope of Enterprise Architecture consists of four main components that are necessary for building an enterprise architecture. While the other components are supportive and depending on what methodology is used, the scope of enterprise architecture is as follows[10], [11]:

1. Business architecture
2. Data architecture
3. Application architecture
4. Technology architecture

The result of this research is an architectural design that is modeled using an architectural framework which is the basic structure used to develop a variety of different architectures using a method to design a target company in building a block. Using an enterprise architecture framework can accelerate architecture development, and ensure the selected architecture in the future responds to business needs[12].

Oracle Architecture development process (OADP) is an approach that aligns enterprise architecture and solutions with practical business strategies and objectives to work collaboratively with customers[13].

Oracle defines a practical approach to working with customers collaboratively, OADP provides a generic underlying process for developing architectures as part of the Oracle Enterprise Architecture Frameworks[14]. Oracle focuses on what must be produced, namely in the form of the main artifact consisting of the four basic enterprise components, and equipped with other components such as enterprise governance, stakeholders, processes, and tools needed for development efficiency[15], [16]. Oracle Architecture Development Process (OADP) contains available components. There are six phase levels namely Architecture Vision, Current State Architecture, Future State Architecture, Strategy Roadmap, EA Governance, and Business Case. Oracle allows many of these phases to run concurrently to reduce the time associated with creating architectures of multiple scopes. Additionally, OADP is intended to be a highly iterative process as the architecture is developed and refined[13], [17].

Figure 1. explains the stages in the OADP methodology which consists of six stages that iteratively take place as follows:

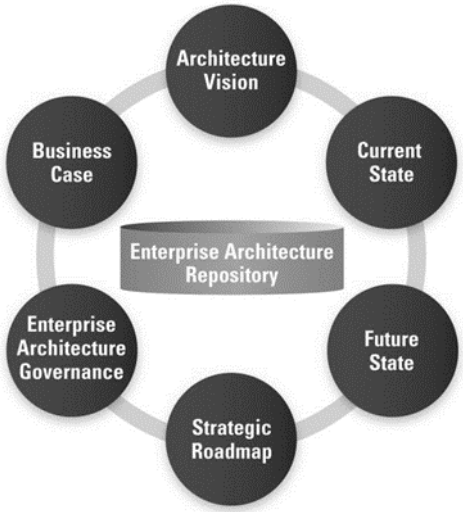

Figure 1. The OADP methodology[18]

The following is an explanation of the components of OADP[19], [20].

1. Architecture Vision
   Determine the vision regarding the direction of enterprise architecture development that will utilize information technology tailored to the enterprise vision.
2. Current State Architecture
   the current condition of the system being run by the enterprise, including the application business processes used and other infrastructure available both in operational and managerial activities.
3. Future State Architecture
   Planning the development needs of enterprise information systems for the future by future business process conditions in the aspects of data, applications, and infrastructure
4. Roadmap Strategy
   It is the stage to create a progressive plan to evolve towards a future state-of-the-art architecture that maximizes the value of each phase of the roadmap and minimizes risks and costs for proposed EA initiatives and implementation of solutions.
5. Governance Architecture

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This stage will evaluate the roadmap by choosing the right governance alternative so that it can be implemented effectively to ensure the successful development of the enterprise architecture until the expected implementation of the new architecture is achieved.

6. Business Case
   Defines the state of the business processes carried out by the enterprise from start to finish. This stage analyzes the cost-benefit of enterprise architecture development

III. RESEARCH METHODS

This research is a type of qualitative research method that is descriptive. The qualitative research method is a research method that is used to examine a natural object condition where the researcher is the key instrument[21]. In this research method, the author uses a research framework and design methods that are made according to the methods and framework used. The method and design of this study discuss the data collection techniques that were carried out to obtain infrastructure data in the Regional Government of Garut Regency.

In carrying out the research, an organized and directed data collection process is needed, therefore a data collection technique is needed during the research, which is as follows:

1. Literature Study / Literature Study
   The literature study carried out in this research is by studying documents/references related to enterprise architecture design, and Oracle Architecture Development Process (OADP) obtained from journals, books, research articles, and internet sites related to the title.
2. Observation
   From this observation process, there are several points to be obtained in the direct review process which includes the use of information technology in work units for each division, which consists of the use of information systems or information technology at the managerial, strategic, and operational levels.
3. Interview
   Interviews were conducted by interviewing E-Government development staff to seek information related to E-Government development activities. The interview process is carried out at a predetermined time by submitting a list of statements that will be given to the person concerned.

The following is the framework used in the research, which is described using the chart as follows.

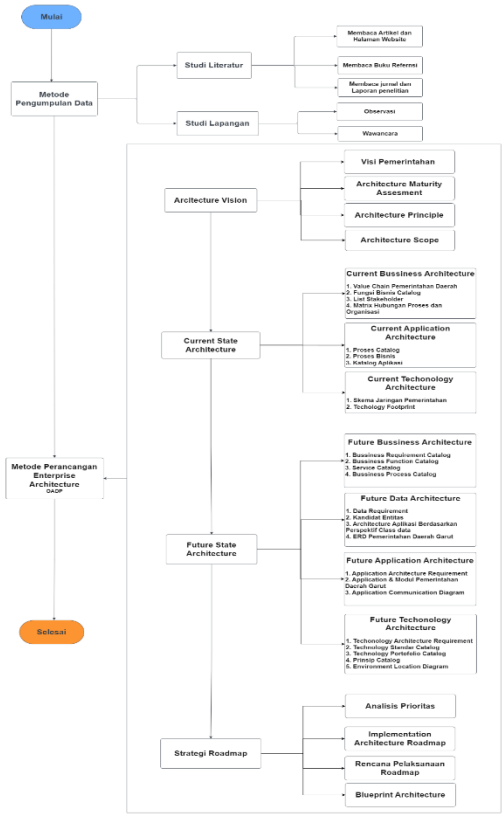

Figure 1. Research thinking framework

IV. RESULT AND DISCUSSION

A. Vision Architecture

The requirements catalog phase of the architecture vision is an exposure to the design vision of the architectural design of the Regional Government of Garut Regency which is explained in the form of a table below.

Table 1. Principle Catalog

VISION INPUT	VISION OUTPUT
1. Organizational Vision and Mission ***2.*** Profile and organizational structure of the Regional Government of Garut Regency. ***3.*** The goals and objectives of the Garut Regency Regional Government organization. ***4.*** Linkage of Strategic Issues with Formulation of	1. Vision Architectural vision, using information technology to support business services for the Regional Government of Garut Regency. 2. The vision of data architecture is the availability of well-integrated databases that are used to support information on the Regional Government of Garut Regency. 3. Application architecture vision,

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VISION INPUT	VISION OUTPUT
Regional Development Priorities 5. Internal Overview of Garut Regency Regional Government	developing and designing all information systems to support the vision and mission of the business processes of the Regional Government of Garut Regency. 4. Technology architecture vision is the availability of technology that supports designed applications, data, and business processes.

Based on the results of the analysis of business functions that have been described in the previous stages, this design is limited to the enterprise architecture design stages by the framework used, which is limited to only a few stages in the Oracle Architecture Development Process OADP framework, namely as follows:

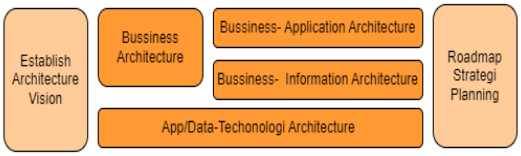

Figure 2. Architecture Scope

B. Current State Architecture

In this section, Value Chain analysis is generated from the Regional Government of Garut Regency, namely as follows.

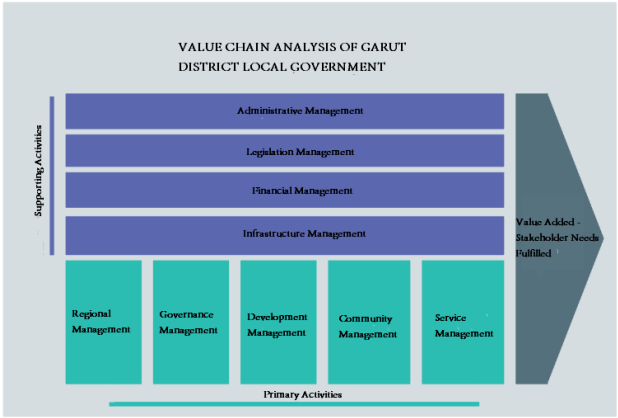

Figure 4. Value Chain Analysis

The purpose of this stage is to define what types and applications are used by the Regional Government of Garut Regency so that it can be known what needs and proposals will be designed in the next stage. This stage results in the flow of business processes that are currently running in the regional government.

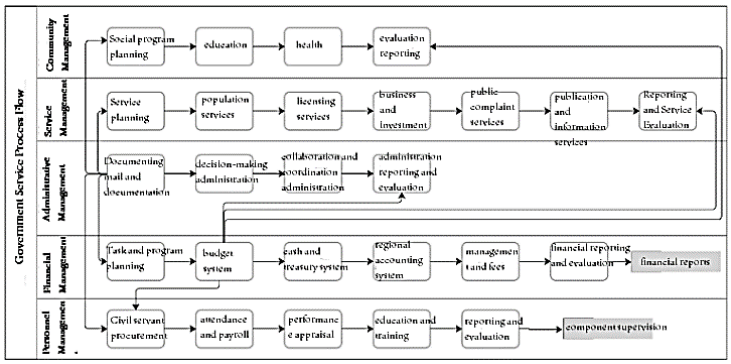

Figure 3. Government Service Process Flow

The technology footprint is part of an explanation of how the implementation of technology has been carried out by the Regional Government of Garut Regency and what technology is used which consists of Networking, management & utility software, DTS Space Recovery System, Application Server, Database Technology, Operating System, Processing Hardware Technology, Physical The environment, storage, and external implementation are explained in the image below.

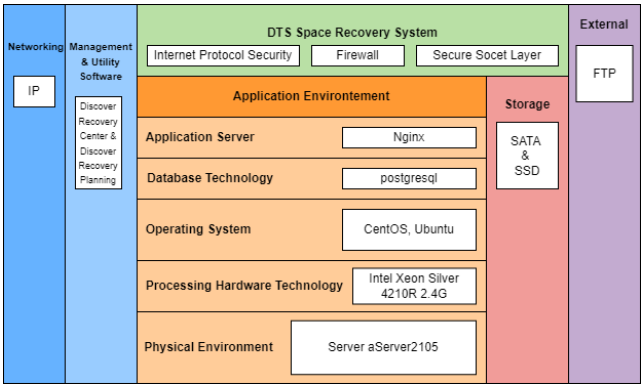

Figure 6. Technology Footprints

C. Future State Architecture

This stage is a stage that describes how the results of the proposed enterprise architecture design are carried out based on the four design elements, namely as follows.

The requirements catalog is used as a reference in designing business architectures that are used to provide inter-purpose, objective, and requirements.

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Table 2. Business Requirements Catalog

GOALS	OBEJTIVES	REQUIREMENTS
Realizing good regional governance	Improving the quality of community public services	Increased response to accelerated public services
		Population administration services that are easy, fast and inexpensive
		Licensing services that are easy, fast, economical, accountable and without brokering
		High increase of investment opportunities
	Continuous improvement of skills, competencies and knowledge of employees	Carry out training according to the related staffing field
		Availability of material for training in accordance with the rules of each employee field
		Organizing certified training
	The number of human resources in accordance with the standard	Carry out employee maintenance in order to achieve standard requirements in each field that requires an increase in human resources

This stage is the stage that explains the proposed data architecture for the regional government of Garut Regency, which is explained using Class diagrams of each designed part.

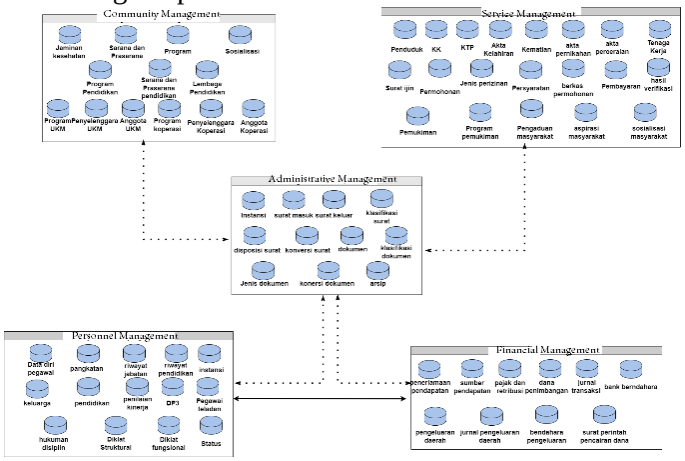

Figure 7. Information Architecture based on data class perspective

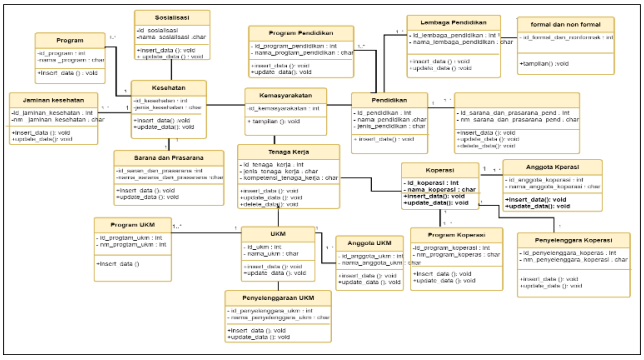

Figure 8. Community Management Class Diagram

Is a stage that explains how the application proposal for all parts or management is carried out by designing the Regional Government of Garut Regency. The proposed application is described using the Mc. Farlan portfolio.

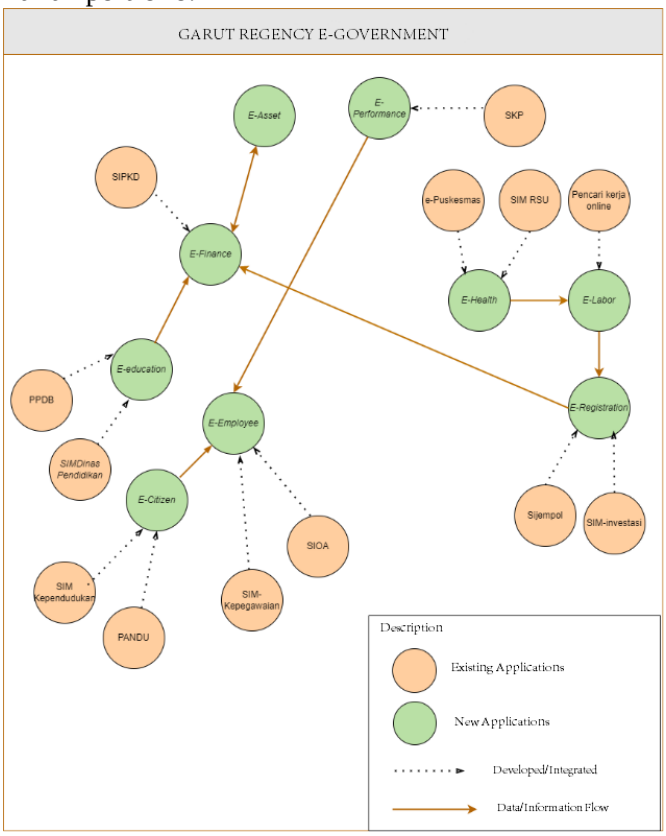

Figure 9. Application Communication Diagram

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Table 3. Portfolio Mc. farlan

STRATEGIC	HIGH POTENTIAL
e-Labor application	e-Employee application
e-archive application	
-Finance application	
KEY OPERATIONS	**SUPPORT**
e-Health application	e-Education application
e-Citizen application	
e-Registration application	
e-Performance application	
e-Asset application	

Technology architecture is an identification of existing technology infrastructure by adjusting it to the requirements of the Garut district government in the field of technology architecture. The following is a technology proposal that is explained using an environment location diagram.

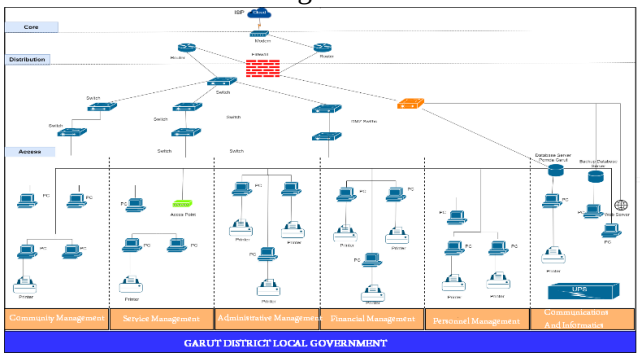

Figure 10. Environment and Location Diagram

D. Roadmap Strategy

Is the final stage carried out in the research, the Strategy Roadmap which is the stage to identify how the design of the migration plan is intended to sequence the information system architecture and application implementation plans. The roadmap strategy produces artifacts in the form of a roadmap implementation plan that adapts the capabilities and needs of the Regional Government of Garut Regency.

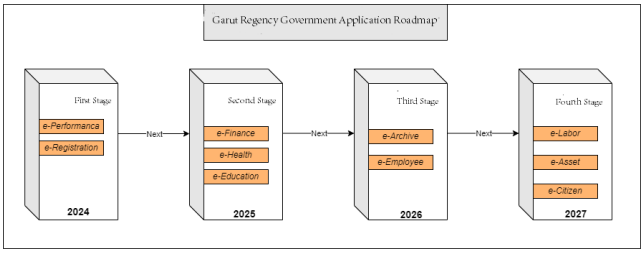

Figure 11. Roadmap Application Sequence

E. Architecture Blueprints

The architecture blueprint is a description for the integration of the design of the Garut Regency Regional Government Enterprise Architecture which describes the information technology development plan. Blueprints are created to define architectural strategies, develop roadmaps to implement strategies, define patterns to guide implementation, and establish technology standards.

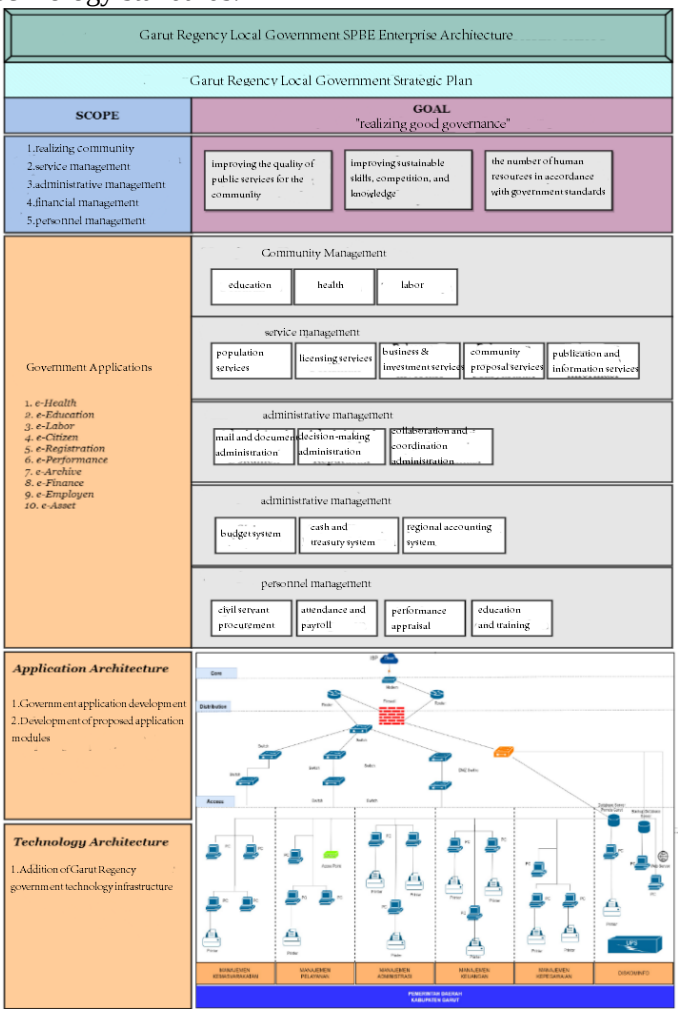

Figure 12. Blueprint Architecture

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V. CONCLUSION AND SUGGESTION

There are several conclusions that can be studied in this research. These conclusions include:

The design of this information system architecture produces a blueprint architecture for four elements in government, namely business, data applications, and technology which can be used as a basis for designing and developing an integrated information system. So that by integrating applications, technology, and data with business processes in the Regional Government of Garut Regency the goals of the Regional Government itself can be achieved. In carrying out this design, an analysis is needed using the OADP (Oracle Architecture Development Process) method.

The design of the enterprise architecture for the Regional Government of Garut Regency produces an architecture design that adapts to the framework used, namely OADP with the artifacts produced in accordance with the framework used.

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