

Enterprise Architecture Design in the General Affair Division of Telkomsel Bali Nusa Tenggara with TOGAF ADM

Putu Eternalie Prajnani Welaga¹, Anak Agung Ngurah Hary Susila², Putu Veda Andreyana³, Berkat Samuel Gunawan Naibaho⁴

¹Department of Information Technology
Faculty of Engineering, Udayana University
Bali, Indonesia
eternalieprajnani@student.unud.ac.id

Abstract – Telkomsel Bali Nusa Tenggara is one of the regions owned by Telkomsel. In each region, there is a General Affair division that is responsible for managing the company's operational needs. In supporting existing activities, the General Affair division already has an information system. However, there are still business processes that are carried out manually and there are no information system design guidelines for the General Affair division. Therefore, it is necessary to design enterprise architecture using TOGAF ADM with eight phases consisting of Preliminary Phase, Requirement Management, Architecture Vision, Business Architecture, Information System Architecture, Technology Architecture, Opportunities and Solutions and Migration Planning. The purpose of this research is to create a division architecture design that is in accordance with the company's vision and mission. Data was collected using observation method, interview method and document analysis. The results obtained are the target architecture design and blueprint.

Index Terms— *Blueprint, Enterprise Architecture, General Affair, TOGAF ADM.*

I. INTRODUCTION

The rapid advancement of information technology (IT) has significantly changed business operations across industries. More than just speeding up workflows, IT enables the integration of various elements in business processes, thereby increasing overall enterprise value. In this context, the implementation of enterprise architecture (EA) serves as a measure of IT system maturity by aligning technology infrastructure with the business processes and strategic goals of a company.

This research focuses on PT Telekomunikasi Selular (Telkomsel), a major telecommunications service provider in Indonesia. Specifically, this study focuses on the Bali and Nusa Tenggara regional office, which includes Bali, Kupang, Mataram, and Flores. Each area has a General Affairs division responsible for operational support, including administrative and logistical activities. The division uses two main information systems: a locally developed Punctuality and Accuracy (P2P) system and a

centralized system called eWonder (Electronic Warehouse and Document Manager) to manage incoming and outgoing goods. However, the interviews revealed some challenges in the utilization of systems and business processes in the General Affairs division. The management of operational reports is still prone to inaccuracies and often requires repeated manual verification. In addition, in the process of managing incoming and outgoing goods, excessive workflow still occurs in the goods management process, and the recommendation system for employee business trips is still done manually, and only relies on informal word-of-mouth suggestions.

These inefficiencies indicate the absence of a structured Enterprise Architecture approach, which results in IT implementation not fully supporting business objectives. The lack of EA leads to suboptimal IT performance and is not aligned with organizational goals [1]. Therefore, the development of a comprehensive EA model is essential. Enterprise Architecture provides a blueprint that integrates business, data, application, and technology architecture to meet organizational goals. One of the most widely used

frameworks in EA development is TOGAF (The Open Group Architecture Framework), which provides a standardized methodology known as Architecture Development Method (ADM).

Several studies have successfully implemented TOGAF ADM in various sectors, such as education and government, to assess IT infrastructure readiness and support strategic alignment. Departing from these precedents, this research aims to design an Enterprise Architecture for the General Affairs division in Telkomsel's Bali and Nusa Tenggara regional offices using the TOGAF ADM methodology.

II. LITERATURE REVIEW

A. General Affair

The General Affairs (GA) division plays a vital role in ensuring the smooth running of a company's internal activities. Often referred to as the "housekeeping" unit within an organization, GA is responsible for managing operational needs, facilities, and risk mitigation as well as maintaining external relations. Without this division, companies would struggle to effectively manage infrastructure, mitigate risks, or coordinate external affairs[2]. General Affairs divisions are commonly found in private and public sector organizations. At PT Telekomunikasi Selular (Telkomsel), each regional office has a GA division responsible for handling regional operations. In the Bali and Nusa Tenggara region, which includes Bali, Kupang, Flores, and Mataram, the General Affair unit is headquartered in Bali and reports directly to the central General Affair Manager.

B. Enterprise Architecture

Enterprise Architecture (EA) is a comprehensive concept that includes vision, principles, and key components that guide the design and transformation process in an organization[3]. EA serves as a framework and methodology for analyzing and documenting the current (as-is) and future (to-be) conditions of an enterprise, especially from the perspective of strategy, business processes, and technology integration[4].

According to The Open Group[5], the implementation of a well-structured enterprise architecture has several benefits, first is Increased Efficiency of IT Operations where EA enables more cost-effective software development and maintenance. EA increases application portability, improves security resilience, and streamlines scalability of system components. The second one is Reduced Organizational Risk - a standardized architecture helps reduce long-term risk and minimize IT infrastructure complexity. And the third one is Simplified Decision Making, EA facilitates coherent planning and procurement by providing structured information that supports strategic alignment and governance.

C. TOGAF Architecture Development Method

The Open Group Architecture Framework (TOGAF) is an enterprise architecture framework that offers a comprehensive approach to the design, planning, implementation, and governance of enterprise information architecture[6].

1) Preliminary Phase

The Initial Phase is the initial stage of the Open Group Framework methodology. It involves defining the 5W+1H aspects (What, Who, Where, When, Why, and How), gathering relevant information, selecting an appropriate framework, and formulating enterprise architecture principles. These activities are based on data obtained through interviews with key stakeholders[7].

2) Requirement Management

This phase focuses on analyzing the specific needs of the organization and documenting all identified needs[8].

3) Architecture Vision

This phase outlines the initial steps in architecture development, including the definition of the scope, vision and mission of the organization, and its organizational profile[6].

4) Business Architecture

The Business Architecture phase describes the current state of the company's business architecture and includes modeling activities using methods that suit the specific needs of the organization[9].

5) Information System Architecture

The Information Systems Architecture phase is the third stage, which outlines how the information systems interact and the desired technical specifications. This phase produces two main components: Data Architecture and Application Architecture[10].

6) Technology Architecture

This phase focuses on developing the technology architecture, which serves as a basic reference for the implementation phase[11].

7) Opportunities and Solutions

The Opportunities and Solutions phase identifies potential opportunities and corresponding solutions that guide the development of the organization or company[12].

8) Migration Planning

The Migration Planning phase aims to detail the transition process from the old system to the newly recommended system[13].

III. RESEARCH METHOD

This research applies seven stages of the TOGAF ADM framework (Fig.1), namely Preliminary, Architecture Vision, Business Architecture, Information System Architecture, Technology Architecture, Opportunities and Solutions, and Migration Planning. In the Preliminary stage, this research adopts the first two layers of Enterprise Architecture Planning (EAP), namely Planning Initiation and modeling the current business conditions, systems, and technology. This approach is used to gain a more

comprehensive understanding of the technology needs that are most suitable in supporting business processes at the micro business scale.

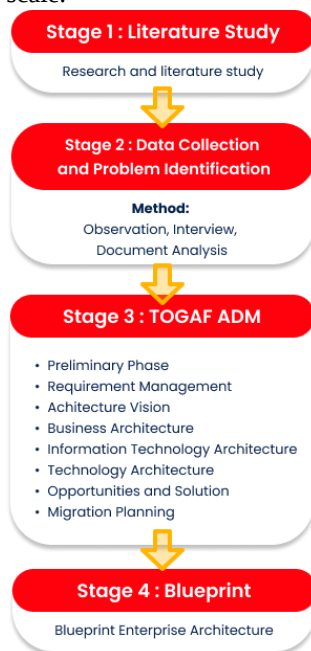


Fig 1. Research Flow

Starting from a literature study to get references to previous research, then continued with data collection and problem identification carried out by observation, interviews and document analysis. In the third stage, enter the phase of TOGAF ADM which consists of 8 phases that will produce an enterprise architecture blueprint.

IV. RESULT

A. Preliminary Phase

The Introduction phase serves as the foundational stage in the development of enterprise architecture, outlining the initial activities that guide subsequent phases. In this research, the results of this phase include the identification of architecture principles adopted by the General Affair Division of PT Telkomsel Bali Nusa Tenggara which are documented in a catalog of principles. In addition, this phase also produces a 5W+1H analysis which becomes a reference for designing enterprise architecture in the next stage of research.

B. Requirement Management

In this phase, identification will be carried out related to core business (Core Business), issues in the organization (Organization Issues) and providing recommendations or solutions to problems in the General Affair division of Telkomsel Bali Nusa Tenggara.

C. Architecture Vision

In the architecture vision phase, a value chain analysis was produced which provides an overview of all activities carried out by the General Affair Division at PT Telkomsel Bali Nusa Tenggara. The results of this analysis are

depicted in the form of a value chain diagram, as shown in Fig 2.

TABLE I
CATALOG OF PRINCIPLES

Domain	Description
<i>Business Principle</i>	Information management principles apply to all parties (stakeholders) in the organization and are in line with business goals and needs, so that all parties in Telkomsel Bali Nusa Tenggara are required to comply with existing principles.
<i>Data Principle</i>	Data is an asset that has important value for the company and can be accessed by users.
<i>Application Principle</i>	Applications do not depend on the choice of certain technologies, so they can be used on various technology platforms and are easy to use.
<i>Technology Principle</i>	Software and Hardware used must match the needs of the application and the standards used and changes are made according to existing business needs.



Fig 2. Value Chain Diagram

D. Business Architecture

Business architecture produces a mapping of business services, business processes and business functions, The mapping will produce business process modeling resulting from the analysis of the value chain diagram in the previous phase. The following are the results of this phase.

1) Operational Report Management Process

The operational report management process is carried out to record operations and produce reports every month using a system called Precise and Punctuality which is carried out by the Bali Nusa Tenggara Regional General Affair division every two weeks.

2) Warehouse Management Process

The warehouse management process is carried out with a system called eWonder. The process consists of four activities starting from Inbound, Outbound, Asset Storing and Write-off.

3) Office Travel Recommendation Management Process

The process of managing official travel recommendations is currently still done manually, so a proposal is given regarding digitization into an information system called Trip-sel (Trip with Telkomsel).

E. Information Technology Architecture

Information architecture produces two types of architecture consisting of data architecture and application architecture. This analysis is carried out on the current architecture (as-is) and later the design will be carried out from the target architecture (to-be).

1) Data Architecture

Data architecture aims to identify and formulate the data needs required by the enterprise in supporting the implementation of business functions. This architecture describes all data entities that will be created, managed, and utilized by various business functions or processes as shown in Table 2.

TABLE II
DATA ENTITY

Business Entity	Data Entity
Precise and Punctuality (P2P)	- Pegawai - Laporan_P2P - Admin
Trip with Telkomsel (Trip-sel)	- User - Admin - Super Admin - Pegawai - Pemesanan_hotel - Detail_pemesanan_hotel - Wisata - Ayo_jalan_jalan - Rekomendasi_wisata - Hotel - Hotel_gambar - Rekomendasi_hotel - Hotel_fasilitas - Hotel_kamar - Detail_kamar - Oleh_oleh - Alamat_oleh_oleh - Restoran

2) Application Architecture

The application architecture is built based on the data architecture that has been built and the business functions that have been determined previously, here is the application architecture that has been designed (Table 3).

F. Technology Architecture

The technology architecture designed adapts to the needs of Telkomsel Smart Office Denpasar by producing a network topology using network tools in supporting the business processes of the General Affair division of Telkomsel regional Bali Nusa Tenggara.

G. Opportunities and Solutions

The gap analysis is organized in the form of a matrix that aims to identify elements of the business, information systems, and technology that need to be added (new), updated (replace), eliminated (eliminate), or retained (retain).

TABLE III
APPLICATION CANDIDATE LIST

Application Candidate	Function
Precise and Punctuality (P2P) ver 2.0	Collecting the results of reports conducted by each General Affair staff with the application of auto generated in report management so that manual report management is systemized.
Trip-sel (Trip with Telkomsel)	Displays recommendation data for business travel needs. Starting from hotel recommendations that have special and priority prices, restaurant recommendations, souvenirs and tourist attractions. And allows users to order recommended places that are integrated with the Moana application.

1) Business Architecture

Based on the table above, the gap analysis on business architecture is obtained and it is known that there are 2 business activities with the status of “replace” and one business activity into “retain”.

TABLE IV
GAP ANALYSIS BUSINESS ARCHITECTURE

	existing	Operational Management	Report	Warehouse Management, with eWonder and TPAS	Management of Service Travel Recommendations
future					
Automated Report Data Integration and Processing					
Warehouse management, without the use of TPAS					
Digital Management of Service Travel Recommendations					
eliminated					

Description:

	: Retain		: Replace		: New
--	----------	--	-----------	--	-------

2) Information System Architecture

The gap analysis showed that the Precise and Punctuality (P2P) system was “replace” as it was updated through integration with the central application (Moana) and automation of manual processes. The eWonder system was maintained (“retain”) without change, while the new Trip-cell system was categorized as “new”.

TABLE V
GAP ANALYSIS INFORMATION SYSTEM ARCHITECTURE

	existing	Precise and Punctuality (P2P)	eWonder	new
future				
Precise and Punctuality (P2P) – versi 2.0				
eWonder				
Trip-sel (Trip with Telkomsel)				
eliminated				

Description:

	: Retain		: Replace		: New
--	----------	--	-----------	--	-------

3) Technology Architecture

A gap analysis of the technology architecture at Telkomsel Smart Office Denpasar shows that of the total technologies used, seven are retained (“retain”), five are updated (“replace”), and three are new technologies (“new”).

TABLE VI
GAP ANALYSIS TECHNOLOGY ARCHITECTURE

existing \ future													
	Laptop	Server	Printer	Router	Firewall	Switch	Access Point	OS	Web Browser	DBMS	Office Suite	Cloud Storage	new
Laptop	Retain												
Server		Replace											
Printer			Replace										
Router				Replace									
Firewall					Replace								
Switch						Replace							
Access Point							Replace						
Switch (1)								Replace					
Access Point (1)									Replace				
Operating System									Replace				
Web Browser										Replace			
DBMS											Replace		
Office Applications												Replace	
Cloud Storage													Replace
eliminated													

Description:

Retain	Replace	New
--------	---------	-----

H. Migration Planning

The migration planning phase aims to outline the transition strategy from the existing system to the future system. The following is the sequence of project implementation planned for the migration process within the General Affair division of Telkomsel Bali Nusa Tenggara region.

TABLE VII
PROJECT IMPLEMENTATION

Order	IT Project
1	Governance and Regulation
2	Management and Standard Operating Procedure
3	Precise and Punctuality (P2P) Ver 2.0
4	Trip-sel (Trip with Telkomsel)
5	Elimination of the TPAS process in the warehouse business process
6	IT Infrastructure Procurement (Backup server, UPS)
7	Evaluation and Monitoring

Procurement of this infrastructure depends on the budget and approval from the central Telkomsel office. The sequence of IT project implementation is then organized into a roadmap for migration planning implementation as shown in the following figure.

TABLE VIII
ROADMAP MIGRATION PLANNING

IT Project	Year I 2025	Year II 2026	Year III 2027	Year IV 2028	Year V 2029	Year VI 2030
Stage 1						
Governance and Regulation						
Management and Standard Operating Procedure						
Stage 2						
Precise and Punctuality (P2P) Ver 2.0						
New system design: Trip-sel (Trip with Telkomsel)						
Stage 3						
Elimination of the TPAS process in warehouse management						
IT Infrastructure Procurement (Backup server, UPS)						
Evaluation and Monitoring						

I. Blueprint

The Enterprise Architecture (EA) blueprint for the General Affair division at Telkomsel Bali Nusa Tenggara encompasses the Vision and Mission, Development Scope, Involved Stakeholders, Business Architecture, Information Systems Architecture, and Technology Architecture, aligned with the target architecture phases in TOGAF ADM, along with a list of planned future IT projects.

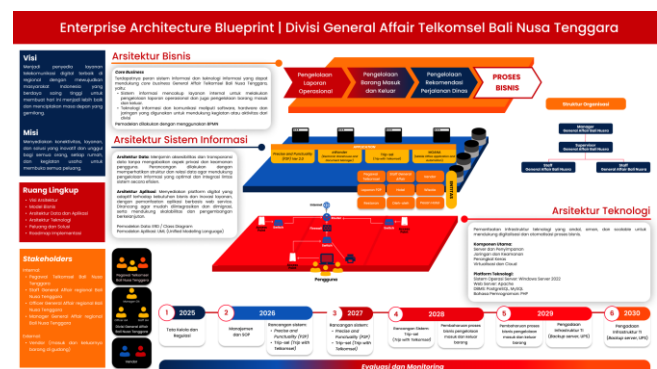


Fig 3. Enterprise Architecture Blueprint

V. CONCLUSION

This research successfully designed Enterprise Architecture for the General Affair Division of PT Telekomunikasi Selular Bali Nusa Tenggara using the TOGAF ADM framework. The resulting business architecture proposes improvements to operational reporting, warehouse management, and official travel recommendations. The data architecture consists of 18 interconnected entities tailored to future business processes. The application architecture includes the development of two systems: Precise and Punctuality (P2P) Ver. 2.0 and a new system called Trip-sel. Meanwhile, the technology architecture proposes upgrading the IT infrastructure to support digital transformation. The complete Enterprise Architecture blueprint serves as a guideline for aligning business processes with information systems and technology capabilities, thus enabling strategic and sustainable IT development in the General Affair division.

REFERENCES

- [1] A. S. Girsang and A. Abimanyu, "Development of an Enterprise Architecture for Healthcare using TOGAF ADM," *Emerging Science Journal*, vol. 5, no. 3, Art. no. 3, Jun. 2021, doi: 10.28991/esj-2021-01278.
- [2] E. Efrizal and H. A. Tawakal, "Pengembangan Aplikasi General Affairs Berbasis Web Menggunakan Framework CodeIgniter Kasus PT. Rajawali Nusantara Indonesia," *DBESTI: Journal of Digital Business and Technology Innovation*, vol. 1, no. 1, Art. no. 1, May 2024, doi: 10.54914/dbesti.v1i1.1095.
- [3] M. R. A. Bintoro, *PERANCANGAN ENTERPRISE ARCHITECTURE PADA FUNGSI SUMBER DAYA MANUSIA DI PT PINDAD ENJINIRING INDONESIA MENGGUNAKAN FRAMEWORK TOGAF ADM*. Universitas Telkom, 2020. Accessed: Nov. 28, 2024. [Online]. Available: <https://repository.telkomuniversity.ac.id/pustaka/162363/perancangan-enterprise-architecture-pada-fungsi-sumber-daya-manusia-di-pt-pindad-enjiniring-indonesia-menggunakan-framework-togaf-adm.html>
- [4] D. Apriana and S. Wahyu, "Penerapan Model Enterprise Architecture Cube Pada Perencanaan Strategi Sistem Dan Teknologi Informasi," *Jurnal Teknologi Informasi dan Ilmu Komputer*, vol. 11, no. 3, Art. no. 3, Jul. 2024, doi: 10.25126/jtiik.1137612.
- [5] "The Open Group Architecture Framework Version 8.1.1." Accessed: Dec. 30, 2024. [Online]. Available: <https://pubs.opengroup.org/architecture/togaf8-doc/arch/>
- [6] S. N. Marwiyah, C. O. S, and Suyanti, "Perancangan Arsitektur Sistem Informasi Menggunakan Togaf ADM," *KLIK: Kajian Ilmiah Informatika dan Komputer*, vol. 3, no. 6, Art. no. 6, Jun. 2023, doi: 10.30865/klik.v3i6.861.
- [7] Y. S. Hudha, E. Utami, and E. T. Luthfi, "Perancangan Enterprise Arsitektur Sistem Informasi Billing PT. Time Excelindo Menggunakan TOGAF ADM," *Creative Information Technology Journal*, vol. 5, no. 1, Art. no. 1, Jul. 2019, doi: 10.24076/citec.2017v5i1.125.
- [8] M. Firdaus, "Perancangan Enterprise Arsitektur Menggunakan TOGAF ADM Di Bea Cukai Tanjung Pandan pada Aplikasi SIMPORA," *Jurnal Informatika*, vol. 3, no. 1, Art. no. 1, Mar. 2024, doi: 10.57094/ji.v3i1.1440.
- [9] J. Rosadi, F. Sembiring, and A. Erfina, "Implementasi TOGAF ADM pada Perancangan Sistem Informasi Antrian Klinik Berbasis Web dengan Estimasi Waktu Tunggu," *Jutisi : Jurnal Ilmiah Teknik Informatika dan Sistem Informasi*, vol. 10, no. 3, Art. no. 3, Dec. 2021, doi: 10.35889/jutisi.v10i3.716.
- [10] F. Z. Fahlevi, F. Dewi, and D. Praditya, "Analisis dan Perancangan Enterprise Architecture Menggunakan TOGAF ADM di Unit Koleksi Penagihan," *KLIK: Kajian Ilmiah Informatika dan Komputer*, vol. 4, no. 1, Art. no. 1, Aug. 2023, doi: 10.30865/klik.v4i1.1198.
- [11] S. N. Marwiyah, C. O. S, and Suyanti, "Perancangan Arsitektur Sistem Informasi Menggunakan Togaf ADM," *KLIK: Kajian Ilmiah Informatika dan Komputer*, vol. 3, no. 6, Art. no. 6, Jun. 2023, doi: 10.30865/klik.v3i6.861.
- [12] A. P. Ayudia, *ANALISIS DAN PERANCANGAN ARSITEKTUR PERUSAHAAN MENGGUNAKAN KERANGKA KERJA TOGAF ADM 10 PADA UNIT PENGELOLA TEKNOLOGI INFORMASI PT. XYZ*. Universitas Telkom, S1 Sistem Informasi, 2023. Accessed: Dec. 19, 2024. [Online]. Available: <https://repositori.telkomuniversity.ac.id/pustaka/204839/analisis-dan-perancangan-arsitektur-perusahaan-menggunakan-kerangka-kerja-togaf-adm-10-pada-unit-pengelola-teknologi-informasi-pt-xyz.html>
- [13] B. G. Sudarsono, A. S. Tandiono, J. F. Andry, Y. Carolina, and O. Azhari, "PERANCANGAN ENTERPRISE ARCHITECTURE MENGGUNAKAN TOGAF PADA PERUSAHAAN PENGEMBANG PROPERTI," *JBASE - Journal of Business and Audit Information Systems*, vol. 5, no. 2, Aug. 2022, doi: 10.30813/jbase.v5i2.3777.