

Integrating Digital Governance for Disaster Resilience: A TOGAF 10-Based Enterprise Architecture for Coastal Villages in Eretan Wetan, Indonesia

Sofiyatun Hasanah¹, Asti Amalia Nur Fajrillah^{*2}, Iqbal Yulizar Mukti³

^{1,2,3}Information Systems, Faculty of Industrial Engineering, Telkom University, Indonesia

Email: ²astiamalia@telkomuniversity.ac.id

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Abstract

Indonesia's coastal regions face significant challenges due to climate change and natural disasters such as coastal abrasion, tidal flooding, and high waves, which impact the social and economic sustainability of rural communities. One of the vulnerable areas is Eretan Wetan Village, Kandanghaur Subdistrict, Indramayu Regency, which has a low score of 5.88 for SDGs Goal 13 (Climate Action Village). This study aims to design an Enterprise Architecture to support the implementation of a more effective, structured, and sustainable Coastal Disaster-Resilient Village (Destana). The design adopts the TOGAF 10 framework, covering the phases of Preliminary, Architecture Vision, Business Architecture, Data Architecture, Technology Architecture, Opportunities and Solutions, and Migration Planning. The outcome of this study includes an architectural blueprint and IT roadmap, which are expected to serve as a strategic guide for the village government in developing an integrated and adaptive disaster management system. Through this approach, Eretan Wetan Village is expected to enhance disaster preparedness, strengthen stakeholder coordination, and contribute to the achievement of sustainable development goals. This study shows how important it is in the field of information systems to solve real-world problems in rural regions through digital system integration.

Keywords : *Disaster-Resilient Village, Disaster Management, Enterprise Architecture, SDGs, TOGAF 10.*

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1. INTRODUCTION

Villages in coastal areas are one of the areas that are often prone to natural disasters. Tidal flooding is one example of a disaster that often occurs in coastal areas due to global sea level rise [1]. This increase causes shrinkage of land area and retreat of coastlines. As a result, during high tides, water can inundate settlements and other land uses, disrupting the activities of coastal communities [2].

The impact of frequent disasters in coastal villages is not only felt in the form of physical damage, but also affects the social and economic aspects of the community. In many cases, coastal disasters including tidal floods, coastal abrasion, and high waves can damage residential areas, public facilities, and other vital facilities and infrastructure, disrupting the economic and social activities of the community [3], [4], [5]. Various sectors such as fisheries and agriculture are also the main sectors that can be directly affected. The fisheries sector, which is the main livelihood of most coastal communities, is also severely affected. Changes in marine ecosystems and damage to coral reefs due to rising sea temperatures and the effects of abrasion reduced fish catches, which had a direct impact on community income [6]. In addition, natural disasters in coastal areas also cause huge losses in the agricultural sector, especially on agricultural land that is submerged in seawater or eroded by coastal abrasion [7]. Land shrinkage and loss of soil fertility reduce food production, leading to declining food security [6].

The importance of disaster resilience in coastal villages is increasingly urgent given the increasing intensity and frequency of natural disasters due to climate change. Disaster resilience is not only about preparedness in the face of disaster itself, but also the ability of a community to survive, recover and adapt after a disaster occurs. [8]. In coastal villages, this resilience is key in ensuring the sustainability of community life and maintaining social and economic stability. Without good resilience, disasters can undermine existing social fabric, cause significant deterioration in quality of life, and exacerbate economic and social inequalities among vulnerable communities [9]

One of the efforts that can be made in building the resilience of coastal villages is by utilizing existing technology. Technology has a very important role in improving the effectiveness of early warning systems, disaster risk management, and post-disaster recovery [10]. By utilizing information and communication technology (ICT), data related to weather conditions, sea tides, and other potential disasters can be analyzed and disseminated in real-time to the community, so that they can take early preventive measures [11], [12], [13]. Technology also enables integration between various systems and parties involved in disaster management, ranging from the government, communities, to non-governmental organizations.

One concrete form of utilizing information technology at the village level is through the Village Information System (SID). SID is a platform designed to integrate important data and information related to village potential, demographics, and disaster risk [14]. The implementation of SID has a strategic role in supporting community-based disaster management, especially through the Desa Tangguh Bencana (Destana) program. Destana aims to improve the preparedness of village communities in facing disaster threats, with a focus on risk mitigation and local capacity building. With the establishment of Destana, it is expected that public awareness of the importance of protecting the environment will increase [15], [16]. This is in line with the 3rd Pillar of the Sustainable Development Goals (SDGs), namely the environmental development pillar [17].

In developing the concept of Disaster Resilient Village (Destana), this research focuses on one of the potentially disaster-prone coastal villages, namely Eretan Wetan Village. This village is located in Kandanghaur Sub-district, Indramayu Regency, West Java Province. The coastal area of Kandanghaur Sub-district shows a high risk of extreme waves and abrasion, as evidenced by the occurrence of coastal abrasion in Eretan Village and extreme waves in 2020 and 2021. The impacts include damage to coastal infrastructure and loss of coastline, threatening the survival of coastal communities [18]. Residents in Eretan Wetan Village are also often faced with tidal flooding that disrupts their daily activities, including household activities, road access, and the use of public facilities. These tidal floods not only damage coastal infrastructure due to abrasion, but also cause residents to lose their homes and sources of livelihood. One of the significant impacts of tidal flooding is the change in productive land use, which is reduced or even lost due to seawater inundation. Many pond farmers have had to turn to industrial workers because their ponds were submerged. The impact of tidal flooding is different for people who depend on fishing on the high seas compared to pond farmers, whose livelihoods are highly dependent on fishing grounds that are easily affected by climate change [19].

To improve the capacity of communities to reduce disaster risks, Disaster Resilient Villages (Destana) were developed as a strategic step, with the Head of BNPB having issued Regulation No. 1/2012 on General Guidelines for Disaster Resilient Villages. However, despite almost a decade having passed, not all disaster-prone villages have successfully transformed into Disaster Resilient Villages [17]. Strengthening capacity at the regional level is crucial in dealing with increasingly complex disaster threats due to climate change, and one tool to measure this capacity is the Regional Capacity Index (IKD). IKD serves to assess the ability of regions to carry out disaster management comprehensively by covering various aspects such as policies and institutions, risk assessment, logistical readiness, and post-disaster recovery systems. With this measurement, it is expected that local governments can design more

effective disaster mitigation and adaptation programs, thereby creating communities that are more resilient and prepared to face disaster risks.

Based on the analysis of the existing situation, it can be concluded that efforts to build the resilience of coastal villages in Eretan Wetan Village must be supported by the implementation of a Disaster Resilient Village (Destana) program that is able to strengthen community resilience to disaster threats and support the achievement of Sustainable Development Goals (SDGs). The Village SDGs Program is given priority in the context of sustainable development and is supported by the Village Fund. Therefore, this program is a priority in efforts to achieve sustainable development at the village level [20]. Although the concept of Disaster-Resilient Villages (Destana) has been promoted for over a decade, many coastal villages in Indonesia have yet to implement structured, technology-supported disaster management systems. Previous studies have largely focused on community preparedness and infrastructure, with limited exploration of digital integration and architectural planning. There is a lack of research that leverages enterprise architecture frameworks, such as TOGAF 10, to systematically align village-level disaster strategies with information systems and technological infrastructure. To support the implementation of this program, alignment between information technology and organizational goals is required, one of which is through the design of enterprise architecture. Enterprise architecture is a strategic solution that uses a hierarchical approach to align IT and business functions through the integration of information systems, processes, organizational units, and various related parties in an organization [21], [22]. Enterprise achitecture framework or EAF aids the architectural planning process, providing guidance and measuring the maturity of architectural methodologies within an organization, thus supporting the integration and efficiency of technology and business strategies [23].

To support this design, it is necessary to design enterprise architecture using the TOGAF 10 framework as a framework that facilitates the process of designing enterprise architecture because this method is open source, so it is very flexible to be used by various parties with the aim of harmonizing existing business processes with information technology owned [24]. TOGAF 10 includes preliminary phase, architecture vision, business architecture, information system architecture, technology architecture, opportunities and solutions, and migration planning. Through the application of TOGAF 10, this research aims to produce an enterprise architecture blueprint and IT Roadmap as a strategic guide for the village government, so that it is expected that Eretan Wetan Village will be able to improve village preparedness in the face of disasters, strengthen collaboration between stakeholders, and create a more effective and efficient system in coastal disaster management.

2. METHOD

2.1. TOGAF ADM

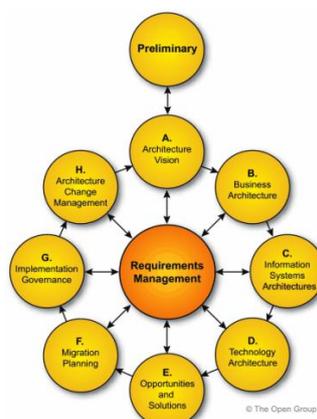


Figure 1. TOGAF ADM

TOGAF (The Open Group Architecture Framework) is a framework that provides methods and tools to develop, manage, and implement Enterprise Architecture (EA) iteratively, with the primary goal of aligning IT strategy with business needs. TOGAF supports four main domains in enterprise architecture: business, data, application, and technology architecture.

In the TOGAF framework, the main method used is the Architecture Development Method (ADM), which plays a role in describing the organization's business processes in a structured manner and determining enterprise architecture requirements that are aligned with business objectives [25]. ADM consists of a number of phases that form an iterative cycle of architecture development. One of the main considerations for selecting TOGAF is the Architecture Development Method (ADM) provides clear steps for building, managing, and implementing Information Systems (IS) with a highly detailed approach [26]. In this research, the phases used include Preliminary, Architecture Vision, Business Architecture, Information Systems Architecture, Technology Architecture, Opportunities and Solutions, and Migration Planning. Meanwhile, advanced phases such as Implementation Governance, Architecture Change Management, and Requirement Management are not discussed because the scope of the research only covers the architectural design and planning stage.

2.2. Data Collection Method

The data collected can be categorized into two types, namely primary data and secondary data. Primary data is obtained directly by researchers through various methods, such as interviews, field observations, questionnaire surveys, or other techniques relevant to the research. In this study, researchers used a direct interview method with the Eretan Wetan Village Government. The following Table 1 attaches the data that will be used in this study.

Table 1. Data Collection

Data Types	Data source	Information
Primary Data	Interviews and observations to stakeholders related to the research (eretan wetan village government, community, and bpbd of indramayu regency)	Information related to work programs, vision and mission, village objectives and existing conditions in the village of eretan wetan
Secondary Data	Medium-term development plan of eretan wetan village for the period 2022-2029	Development plan containing priority activities and medium-term programs for the development of the village of eretan wetan.
	Village monograph book for 2025	Information containing a general description of the profile of the village of eretan wetan.
	Regent's regulation on disaster risk assessment for 2024-2028	Regulations governing disaster risk assessment and mitigation in the indramayu district area.
	Regulation of the head of BNPB No. 1 of 2012 concerning disaster resilient villages	Guidelines that provide guidance in building villages or sub-districts that are resilient to disasters.
	Regulation of the minister of villages No. 13 of 2020 concerning SDGs for villages	Regulations governing the implementation of sdgs at the village level, including indicators that must be achieved for village resilience.
	The TOGAF ® Standard, Version 10	Guidelines for designing enterprise architecture in the village of eretan wetan.

2.3. Data Processing and Evaluation

The data collected was processed using qualitative descriptive analysis where primary data are transcribed and categorized based on ideal and existing conditions relating to disaster management practices and technology readiness. Secondary data are cross references to validate information consistency in regards to village infrastructure, regulatory frameworks and long term development goals. The processed data then constructed as the business and information system architecture using TOGAF 10 frameworks. Data evaluation is done to ensure findings reliability and relevance in shaping the enterprise architecture blueprint. Primary data alignment were cross checked to ensure consistency between stakeholder inputs an the actual implementation gaps in field. Secondary data were analyzed for policy alignment and potential of integration with proposed digital system. This evaluation ensure balanced practical insights from the field with formal documents to strengthen contextual validity of architectural design.

3. RESULT

3.1. Preliminary Phase

Preliminary Phase is the initial stage in the design of enterprise architecture that focuses on preparation and initiation, including the identification of architecture principles that will be the basis for its development. This phase answers the questions “where, what, who, why, and how” to ensure the organization masters the management and transformation of architecture. The main outcome of this phase is the principles catalog, which contains the architecture principles as a guide in the subsequent design process. Table 2 presents the Principle Catalog in Eretan Wetan Village.

Table 2. Principles Catalog

Architecture	Principle	Description
Business Principles	Primacy of Principles	The principles of information management can be applied to all entities in the village government organizational structure.
	Information Management is Everybody’s Business	All entities in the village government participate in information management decision-making to achieve village development goals.
	Business Continuity	Maintaining village government operations to continue running even if there is a disruption to the system.
	Common Use Applications	The development of applications that can be used throughout the village government is prioritized over the development of similar or duplicative applications that only serve one particular entity.
	Service Orientation	This architecture is designed based on services that reflect real activities consisting of business processes that occur in the village government to support efficient and integrated operations.
	Compliance with Law	The village government management process must comply with all applicable laws, policies, and regulations.
Data Principles	Data is an Asset	Data is a valuable asset for the village government that must be managed properly in accordance with applicable policies.
	Data is Shared	Each user must have access to the data needed to carry out their duties, so data needs to be shared effectively across all village government functions and structures.

Architecture	Principle	Description
	Data is Accessible	Data can be accessed by all relevant parties in the village government to support the smooth implementation of tasks.
	Data Trustee	Each data element is managed by a responsible party to ensure its quality and accuracy.
	Data Security	Data must be protected from unauthorized access and disclosure, including sensitive, confidential, and strategic information, to maintain security and public trust.
Application Principles	Technology Independence	Applications are developed flexibly so that they can operate on various platforms without relying on a particular technology.
	Ease-of-Use	Applications must be easy to use with transparent technology, so that village officials can focus on public services.
Technology Principles	Requirements-Based Change	Changes to applications and technologies are made selectively based on relevant business needs.
	Responsive Change Management	Changes in the village government information environment must be implemented in a timely manner to support efficient services and operations.
	Control Technical Diversity	The diversity of technologies is managed in a controlled manner to reduce maintenance costs and ensure efficient connectivity between systems.
	Interoperability	The use of software and hardware must comply with established standards to support optimal interoperability of data, applications, and technology.

3.2. Architecture Vision

Architecture Vision is the first phase in the development of enterprise architecture that aims to define the scope, identify stakeholders, and establish an architectural vision that will be the basis for further development. At this stage, the alignment of business objectives with the design of the architecture and the approval process of the relevant parties to ensure agreement and support in the implementation of the architecture. Figure 2 shows the value chain diagram that illustrates the primary and supporting activities in village governance.

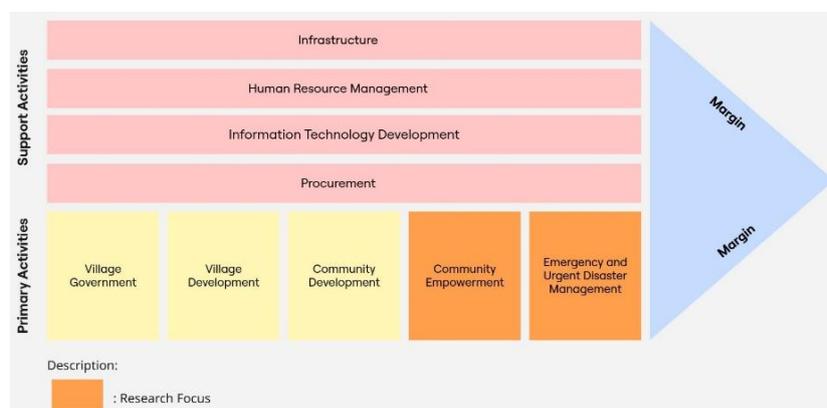


Figure 2. Value Chain Diagram

3.3. Business Architecture

Business Architecture is a phase that aims to describe the business needs of an organization in carrying out the functions and operations of business processes in order to achieve the vision, mission, and goals that have been set. In this phase, architecture development is carried out through three main stages, namely identifying existing business processes, determining the expected business architecture (targeting), and conducting gap analysis between current conditions and desired conditions. The output of the business architecture phase includes goal/objective/requirement diagram and functional decomposition diagram. Figure 3 goal/objective/requirement diagram serves to map the relationship between drivers, goals, objectives, and business functions in Eretan Wetan Village Government.

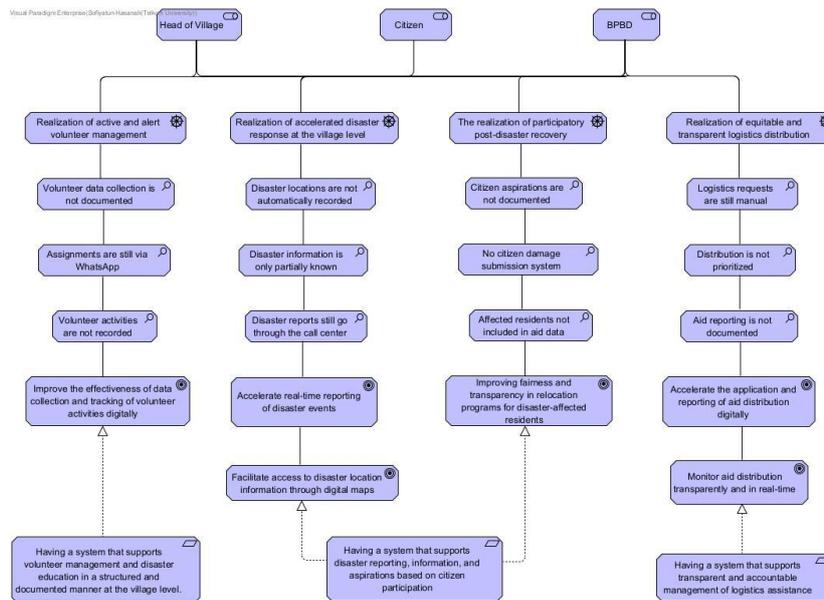


Figure 3. Goal/Objective/Requirements Diagram

Figure 4 is the Functional Decomposition Diagram, which visualizes the relationships between business functions and business processes implemented in the Eretan Wetan Village Government. The diagram is structured based on the value chain framework as a mapping reference, allowing each business activity to be identified in terms of its contribution to strengthening the resilience of the coastal village.

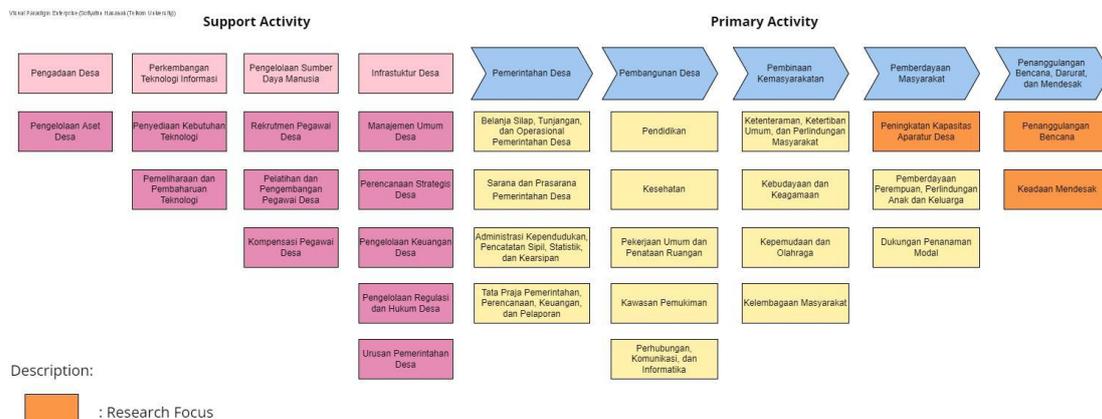


Figure 4. Business Footprint Diagram

3.4. Data Architecture

Data Architecture is one of the phases of Information System Architecture, focusing on the identification and design of data architecture within the development of enterprise architecture. This phase aims to identify the types and sources of data required to support business processes. One of the artifacts produced in this phase is the Data Dissemination Diagram. Figures 5 to 7 show the Data Dissemination Diagrams in the Eretan Wetan Village Government.

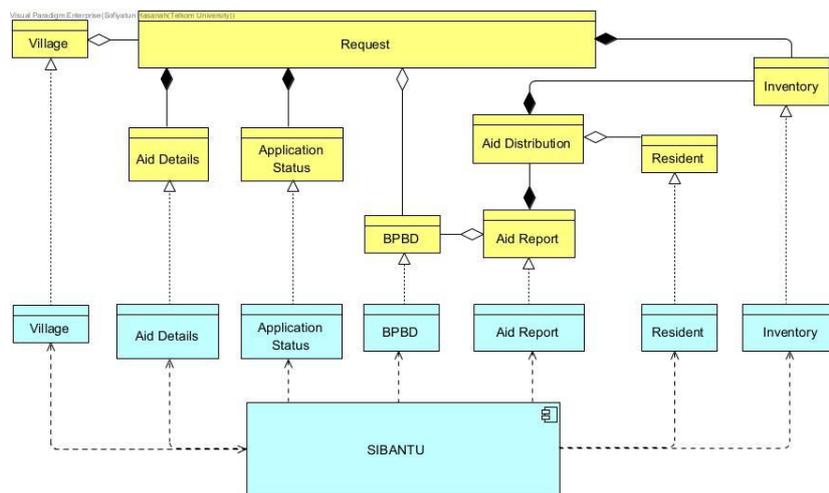


Figure 5. Data Dissemination Diagram of the SIBANTU Application

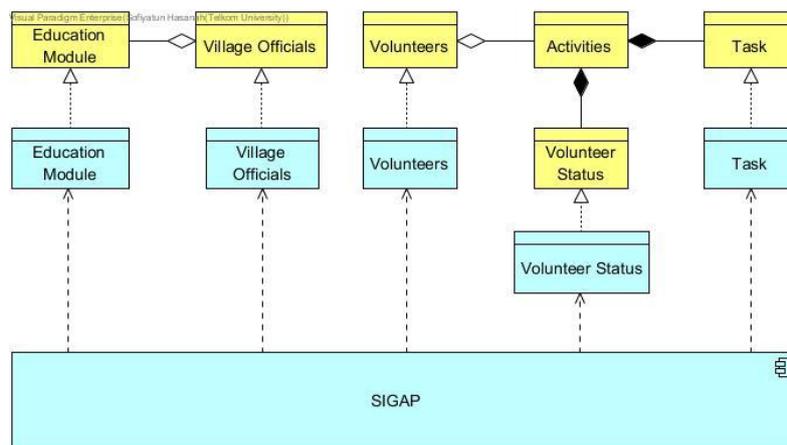


Figure 6. Data Dissemination Diagram of the SIGAP Application

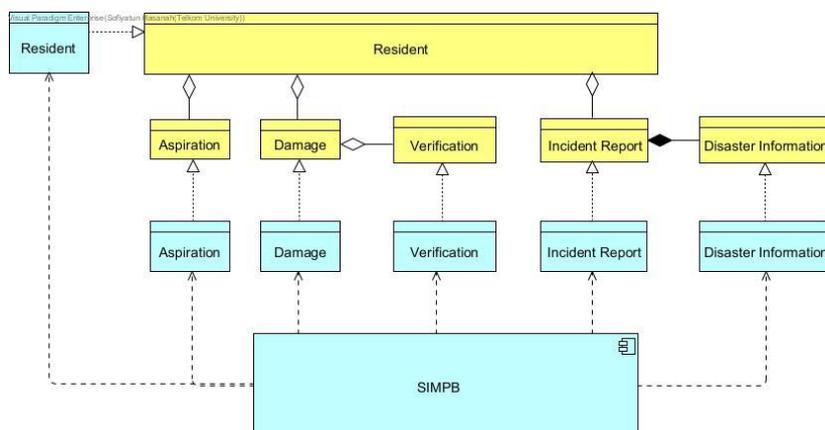


Figure 7. Data Dissemination Diagram of the SIMPB Application

Figures 5 to 7 present the Data Dissemination Diagrams of the SIBANTU, SIGAP, and SIMPB applications in the Eretan Wetan Village Government. These diagrams illustrate the relationships between data entities, business services, and application components, representing the realization of logical data entities into physical form through application components and showing data flows that support the business processes in each system.

3.5. Application Architecture

Application Architecture is a process that defines the interaction and data processing between applications to support information systems, according to the needs of Enterprise Architecture in Disaster Resilient Villages. The artifacts produced include the Application Portfolio Catalog and the Application Communication Diagram. The Application Portfolio Catalog is a catalog-shaped artifact that lists the applications used in the design of Enterprise Architecture within the organization. Table 4 presents the Application Portfolio Catalog for the Eretan Wetan Village Government.

Table 4. Application Portfolio Catalog

Physical Application Component	Description
SIGAP (Disaster Preparedness and Education System)	Village application for volunteer management, assignment data collection, and provision of disaster education modules for the community.
SIBANTU (Disaster Relief Information System)	Village applications for logistics assistance requests, stock monitoring, distribution to affected areas, and reporting on aid distribution.
SIMPB (Disaster Management Information System)	An application owned by BPBD Indramayu that provides disaster reporting services, visual map information, post-disaster aspirations, and submission of house damage by residents.

Figure 8 is the Application Communication Diagram, which illustrates the relationships between application components, interfaces, and data flows between applications used in the Eretan Wetan Village Government.

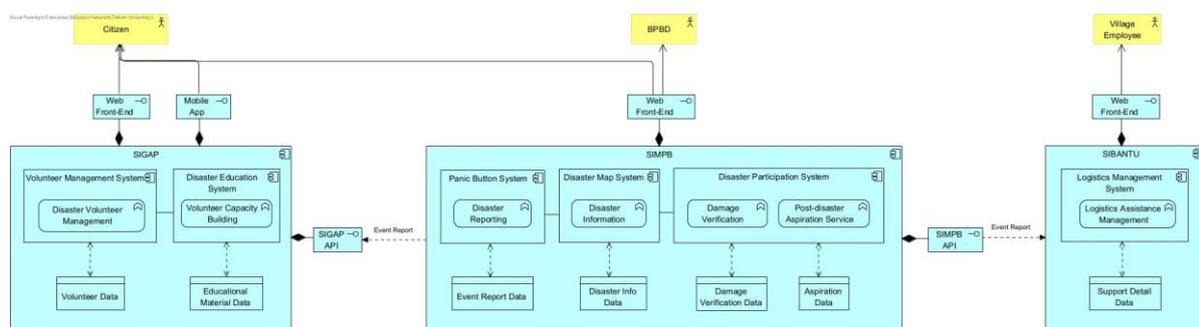


Figure 8. Application Communication Diagram

3.6. Technology Architecture

Technology Architecture is the fourth phase or Phase D in the TOGAF ADM enterprise architecture framework. This phase focuses on designing the use of technology to support application functions in carrying out business processes. One of the supporting artifacts in this phase is the

Environment and Location Diagram, which describes the physical and logical placement of applications in the system environment. Figure 9 shows the Environment and Location Diagram that illustrates the placement of SIGAP, SIBANTU, and SIMPB applications in the Eretan Wetan Village Government system, as well as their relationship with the operational unit and the location where the application is run.

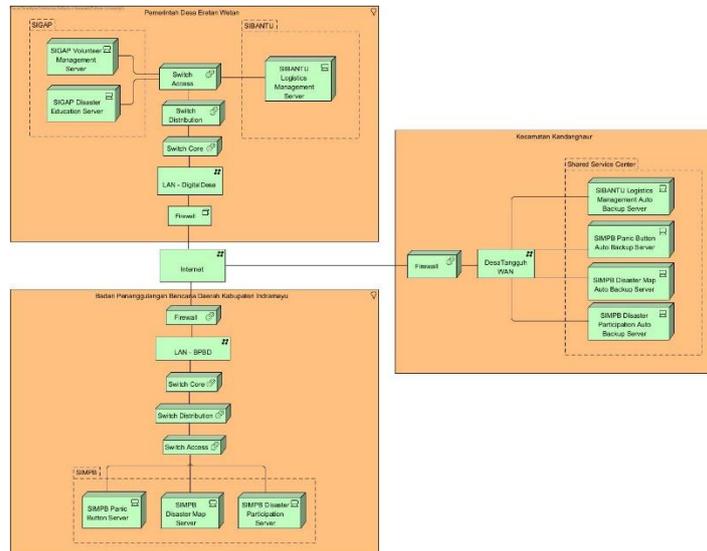


Figure 9. Environment and Location Diagram

3.7. Opportunities and Solutions

Opportunities and Solutions is the fifth phase (Phase E) in TOGAF ADM which serves to evaluate the architecture design and identify gaps between the baseline architecture and the target architecture. This phase produces solutions in the form of work packages that can be implemented by the Village Government. One of the artifacts in this phase is the Project Context Diagram, which illustrates the relationship between the work package and the affected organizational elements, including functions, services, business processes, applications, data, and technology. Figure 10 shows the Project Context Diagram for the design of Disaster Resilient Village Enterprise Architecture in Eretan Wetan Village Government.

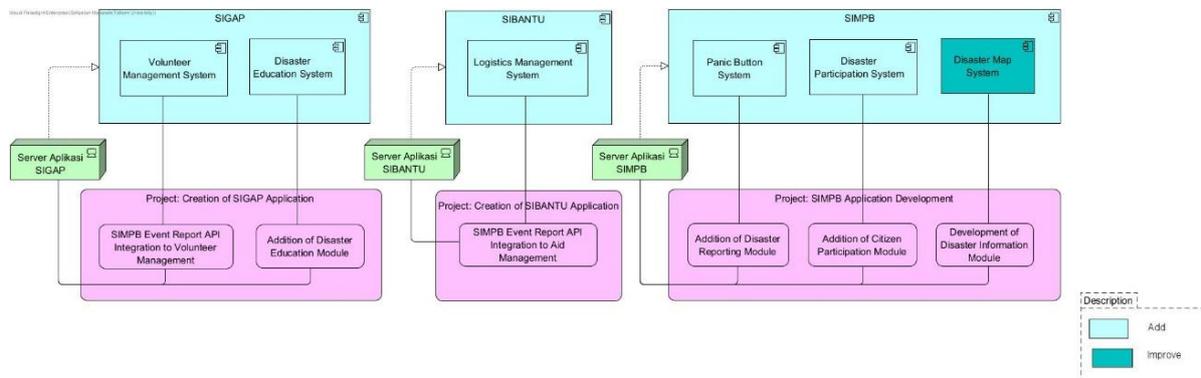


Figure 10. Project Context Diagram

3.8. Migration Planning

Migration Planning is phase F in the TOGAF ADM framework that focuses on evaluating risks and benefits, as well as preparing implementation and migration plans from the initial architecture to the target architecture. In this research, the focus is on two main outputs, namely Business Value Assessment and Project Prioritization. Business Value Assessment maps projects based on value index

and risk index in a two-dimensional matrix. Figure 11 shows the results of the mapping as a basis for analyzing project feasibility.

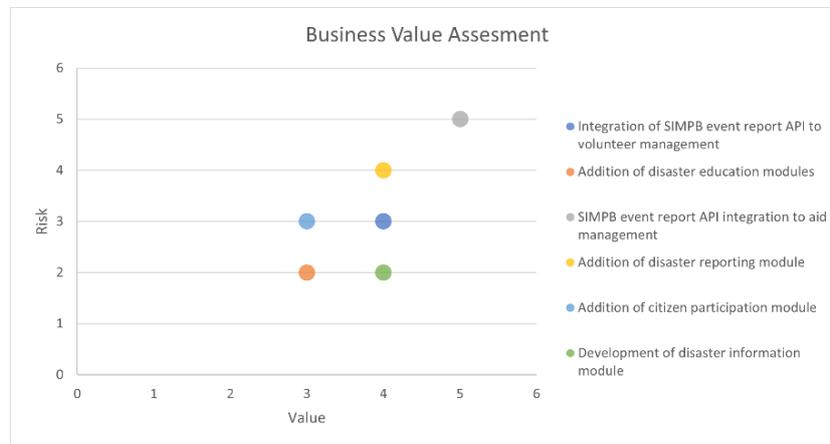


Figure 11. Business Value Assessment

Table 5 displays the prioritization of projects based on the results of the value and risk assessment, taking into account the impact, urgency, and interconnectedness of the modules.

Table 5. Project Prioritization

Work Package	Priority
Development of disaster information module	1
Addition of disaster reporting module	2
Integration of SIMPB event report API to volunteer management	3
Addition of disaster education modules	4
Addition of citizen participation module	5
SIMPB event report API integration to aid management	6

Blueprint Enterprise Architecture is an organizational architecture design used as a reference by the Eretan Wetan Village Government in implementing the Disaster Resilient Village concept. Table 6 presents a blueprint that includes the results of the design from the Preliminary phase to Migration Planning according to the TOGAF ADM framework.

Table 6. Blueprint Enterprise Architecture

BLUEPRINT ENTERPRISE ARCHITECTURE ERETAN WETAN VILLAGE	
SCOPE	COASTAL DISASTER RESILIENT VILLAGE
BASIC DIRECTIVE DOCUMENT	<ol style="list-style-type: none"> 1. Law Number 6 Year 2014 on Villages 2. Regulation of the Head of BNPB Number 1 of 2012 on General Guidelines for Disaster Resilient Villages. 3. Village Medium Term Development Plan (RPJMD) Year 2022 - 2029 4. Regent Regulation on Disaster Risk Assessment Year 2024 - 2028

5. Regulation of the Minister of Villages, Regional Development, Disadvantaged Regions and Transmigration No. 13 of 2020 on Village Sustainable Development Goals (SDGs)
6. SGDs Score Data of Eretan Wetan Village, Kandanghaur District, Indramayu Regency
7. The TOGAF ® Standard, Version 10

STRATEGIC DIRECTION OF THE ORGANIZATION

Vision:
 “To make Eretan Wetan Village religious, advanced, and compact.”

- Mission:
1. To become a religious, advanced, and compact village.
 2. Building adequate and sustainable infrastructure.
 3. Improving the quality of education and public health.
 4. Developing tourism and the natural potential of the village.
 5. Increase community participation in decision-making.
 6. Building community togetherness and solidarity.
 7. Developing innovation and technology for village advancement.

DOMAIN

BUSINESS ARCHITECTURE	DATA ARCHITECTURE
Mapping and proposing business process improvements for village disaster services, including data collection of volunteers, implementation of disaster education, assignment and monitoring of volunteer activities, reporting of disaster events, presentation of interactive map-based disaster information, request and distribution of logistical assistance, reporting on the use of assistance, post-disaster aspiration services, and verification of post-disaster damage.	<ol style="list-style-type: none"> 1. Identifying data entities needed according to the requirements of the SIGAP, SIMPB, and SIBANTU applications. 2. Mapping the data entities used in the SIGAP, SIMPB, and SIBANTU applications into conceptual data diagrams, logical data diagrams, and data dissemination diagrams.
APPLICATION ARCHITECTURE	TECHNOLOGY ARCHITECTURE
<ol style="list-style-type: none"> 1. Development of SIMPB application to support village disaster management, including: <ul style="list-style-type: none"> • Disaster incident reporting • Disaster information presentation • Submission of citizen aspirations 	Develop recommendations for the addition of supporting technology infrastructure, including access points, core switches, distribution switches, access switches, routers, and API integration.

- Reporting damage to houses and public facilities
2. Development of SIGAP application to support volunteer management and disaster education, including:
 - Volunteer data collection and assignment
 - Implementation of disaster education
 3. Development of SIBANTU application to support logistics assistance management, including:
 - Submission of assistance requests
 - Management of stock, distribution, and reports on the use of assistance

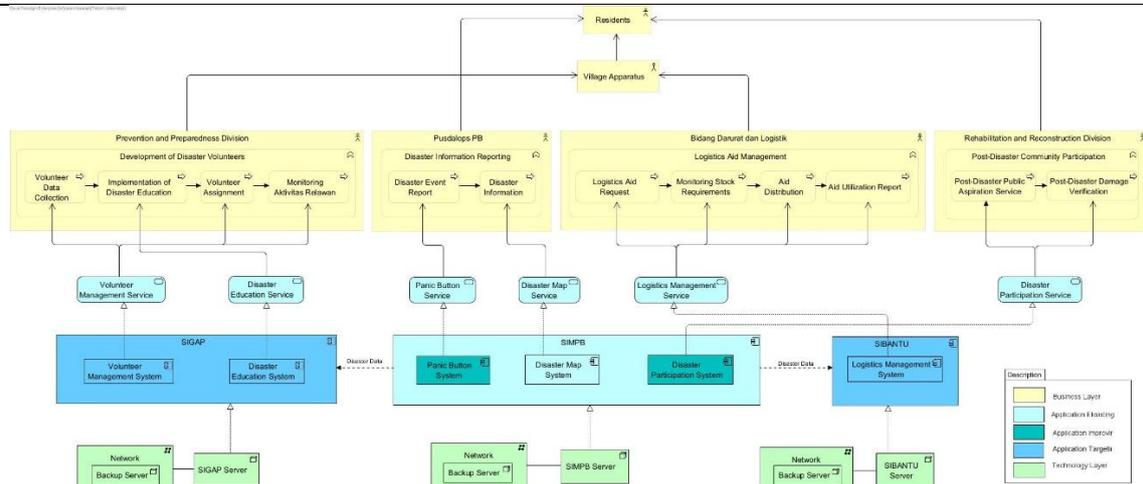
OPPORTUNITIES AND SOLUTION

MIGRATION PLANNING

1. Conduct implementation factor assessment to identify factors that influence the implementation of enterprise architecture and formulate solutions through deduction matrix.
2. Compile a list of proposed projects as part of the enterprise architecture design.
3. Identify the benefits generated from each project developed.

1. Conduct value and risk analysis of planned projects.
2. Arrange the priority scale of project development based on estimated value and risk.
3. Develop IT roadmap and design enterprise architecture blueprint.

ARCHITECTURE VISION (SOLUTION CONCEPT DIAGRAM)



3.9. Comparative Analysis with Previous Studies

This study findings align with previous studies that underline the importance of technology integration to disaster resilient village programs. Studies done by Haque et al. (2024) emphasizes the role of early warning systems in increasing village resilience towards disasters [27]. The implementation of volunteer management systems and disaster education modules in the SIGAP application resonates with the approaches proposed by the study done by Widodo et al. (2023) who highlight the significance of localized capacity building in enhancing village resilience to tsunami risks. This indicates that the proposed enterprise architecture not only responds to local needs but also reflects broader trends in

disaster informatics and community resilience efforts [28]. This study provides a comprehensive TOGAF 10 framework that connect various system to develop an integrated blueprint. This positions the study not merely as a response to local disaster risks, but a scalable model for systematizing village level disaster governance through informatics.

Another framework that is useful in enterprise architecture is the Zachman framework which is a classification framework that organizes architectural aspects based on stakeholder perspectives and abstraction levels [29]. While both TOGAF and Zachman is useful in enterprise architecture, Zachman stands out in structuring documentation but with less directive in implementation aspect. In contrast, the framework used in this study, TOGAF 10, offers a more process oriented approach through the Architecture Development Method (ADM) that guides user through a structured cycle. For planning actionable solutions such as disaster reporting systems and integrated village applications, TOGAF provides a clearer path than Zachman, making this study more applicable for real world implementation at village level.

4. CONCLUSION

Based on the results of designing enterprise architecture for the Coastal Disaster Resilient Village in Eretan Wetan Village using the TOGAF 10 framework, this research produces an architecture blueprint that includes Business, Data, Application, and Technology Architecture. The business architecture identifies problems in disaster management that are still manual and undocumented, and designs six integrated digital solutions, such as volunteer management systems, disaster education, interactive maps, rapid reporting, citizen aspirations, and aid management. The data architecture designs entities and their relationships, while the application architecture includes the SIGAP and SIBANTU systems integrated with the existing SIMPB application. The technology architecture designs infrastructure requirements and API integration to support system connectivity. It is hoped that this design can help Eretan Wetan Village strengthen its disaster resilience and support the achievement of SDGs Village Goal 13, namely Climate Change Resilient Village. Further research is advisable to focus on the implementation stage and evaluation of the system's impact on improving disaster readiness and response at the village level as this study only carried out the TOGAF 10 framework until the migration planning step.

REFERENCES

- [1] A. Asrofi, S. R. Hardoyo, and D. Sri Hadmoko, "Strategi Adaptasi Masyarakat Pesisir Dalam Penanganan Bencana Banjir Rob Dan Implikasinya Terhadap Ketahanan Wilayah (Studi Di Desa Bedono Kecamatan Sayung Kabupaten Demak Jawa Tengah)," *J. Ketahanan Nas.*, vol. 23, no. 2, p. 1, 2017, doi: 10.22146/jkn.26257.
- [2] D. Wacano, A. A. Rif'an, E. Yuniastuti, R. W. Daulay, and M. A. Marfai, "Adaptasi Masyarakat Pesisir Kabupaten Demak Dalam Menghadapi Perubahan," *Seri Bunga Rampai Pengelolaan Lingkungan. Zamrud Khatulistiwa*, no. September, pp. 20–33, 2013.
- [3] K. Karnaji, E. Susanti, S. Ariadi, and M. Saud, "Social Impacts and Post-Disaster Management in Disaster-Prone Areas of East Java, Indonesia," *Jambá J. Disaster Risk Stud.*, vol. 16, no. 1, pp. 1–9, 2024, doi: 10.4102/JAMBA.V16I1.1747.
- [4] W. J. W. Botzen, O. Deschenes, and M. Sanders, "The Economic Impacts of Natural Disasters: A Review of Models and Empirical Studies," *Rev. Environ. Econ. Policy*, vol. 13, no. 2, pp. 167–188, 2019, doi: 10.1093/reep/rez004.
- [5] W. Fela, R. Dwight, and S. Julianus, "Study of The Impact of Coastline Changes on Coastal Settlement Areas Along th East Coast of Minahasa," *Devot. J. Res. Community Serv.*, vol. 5, no. 2, pp. 203–212, 2024, doi: 10.59188/devotion.v5i2.681.
- [6] A. Winarna, S. Anwar, Universitas Pertahanan, and P. Priyanto, "Strategi Pemberdayaan

- wilayah pesisir dalam menghadapi bencana Tsunami serta Implikasinya terhadap ketahanan wilayah,” *J. Ketahanan Nas.*, vol. 26, no. 1, pp. 108–131, 2020.
- [7] P. R. de Barros, A. N. Schultenburg, K. Gedan, C. Miller, and K. L. Tully, “Effects of Saltwater Intrusion on Candidate Restoration Species in Coastal Agricultural Fields,” *Agric. Ecosyst. Environ.*, vol. 392, no. 1, pp. 1–12, 2025, doi: 10.1016/j.agee.2025.109757.
- [8] Yugyasmono, Gandar Mahojwala, Eko Teguh Paripurno, and Purbudi Wahyuni, “Perbandingan Nilai Ketangguhan Desa Pesisir Atas Risiko Tsunami Dan Faktor Perubahan Nilai Ketangguhan: Studi Atas Desa Parangtritis Dan Desa Tirtohargo, Kabupaten Bantul,” *Indones. J. Environ. Disaster*, vol. 2, no. 2, pp. 201–213, 2023, doi: 10.20961/ijed.v2i2.882.
- [9] M. C. de Ruiter and A. F. van Loon, “The Challenges of Dynamic Vulnerability and How to Assess it,” *iScience*, vol. 25, no. 8, pp. 1–13, 2022, doi: 10.1016/j.isci.2022.104720.
- [10] R. Kopa, A. Sosry, and T. Kasim, “Ipteks Bagi Masyarakat Nagari Tangguh Bencana Melalui Kelompok Siaga Bencana (KSB) Sungai Nyalo Mudiek Aia, Kecamatan Koto XI Tarusan Kabupaten Pesisir Selatan,” *J. Sains dan Teknol. J. Keilmuan dan Apl. Teknol. Ind.*, vol. 17, no. 2, p. 65, 2017, doi: 10.36275/stsp.v17i2.27.
- [11] B. Biswal, “Role of Information and Communication Technology (ICT) in Disaster Management: A Study in India,” *Int. J. Polit. Sci. Gov.*, vol. 6, no. 2, pp. 10–15, 2024, doi: 10.33545/26646021.2024.v6.i2a.352.
- [12] H. F. Harumy, D. S. Ginting, F. Y. Manik, and M. B. Yel, “Dominant Disaster Detection and Prediction in Coastal Areas Using Neural Network System To Optimize Disaster Management in Coastal Areas,” *Eastern-European J. Enterp. Technol.*, vol. 2, no. 2(134), pp. 6–16, 2025, doi: 10.15587/1729-4061.2025.321966.
- [13] N. F. Riama, R. F. Sari, H. Rahmayanti, W. Sulistya, and M. H. Nurrahmat, “The Level of Public Acceptance to the Development of a Coastal Flooding Early Warning System in Jakarta,” *Sustainability*, vol. 13, no. 2, pp. 1–25, 2021, doi: 10.3390/su13020566.
- [14] E. Mardinata, T. D. Cahyono, and R. M. Rizqi, “Transformasi Digital Desa Melalui Sistem Informasi Desa (SID): Meningkatkan Kualitas Pelayanan Publik dan Kesejahteraan Masyarakat,” *Parta J. Pengabd. Kpd. Masy.*, vol. 4, no. 1, pp. 73–81, 2023, doi: 10.38043/parta.v4i1.4402.
- [15] S. Arifin, S. S. Wicaksono, S. Sumarto, M. Martitah, and D. Sulistianingsih, “Disaster Resilient Village-Based Approach to Disaster Risk Reduction Policy in Indonesia: A Regulatory Analysis,” *Jambá J. Disaster Risk Stud.*, vol. 13, no. 1, pp. 1–9, 2021, doi: 10.4102/JAMBA.V13I1.1021.
- [16] Sunarto *et al.*, “Strengthening Disaster-Resilient Villages Through Participatory Approaches: Policy Recommendations for Village Governments,” *Heal. Dyn.*, vol. 2, no. 4, pp. 166–171, 2025, doi: <https://doi.org/10.33846/hd20405>.
- [17] Z. Ratnasari and W. Wildawati, “Sumber-Sumber Pendanaan Pembentukan Desa Tangguh Bencana (Destana) Dalam Rangka Peningkatan Kapasitas Masyarakat Menghadapi Bencana di Kabupaten Lampung Selatan,” *Bappenas Work. Pap.*, vol. 5, no. 3, pp. 308–333, 2022, doi: 10.47266/bwp.v5i3.110.
- [18] 2024 Perbup KRB BPBD Kab.Indramayu, “PERBUP KRB DAN DOKUMEN KRB,” *Ayan*, vol. 15, no. 1, pp. 37–48, 2024.
- [19] Y. Asyiwati, J. Oskar, and A. N. Azizah, “Pengembangan desa dalam adaptasi terhadap banjir rob (studi kasus : desa eretan wetan) Village Development In Adaptation Against Rob Floods (Case Study : Eretan Wetan Village). Tidal,” vol. 7, no. 2, pp. 100–107, 2023.
- [20] A. Fasa, A., Berliandaldo, M., & Prasetyo, “Strategi Pengembangan Desa Wisata Berkelanjutan Di Indonesia: Pendekatan Analisis Pestel,” *J. Bali Membangun Bali*, vol. 1, no. 1, pp. 22–26, 2022.
- [21] E. Atencio, G. Bustos, and M. Mancini, “Enterprise Architecture Approach for Project Management and Project-Based Organizations: A Review,” *Sustainability*, vol. 14, no. 16, pp. 1–25, 2022, doi: 10.3390/su14169801.

-
- [22] B. Adhytia, S. Kurnia, R. P. Dilnutt, and A. N. Hidayanto, "Investigating the Role of Enterprise Architecture in Big Data Analytics Implementation: A Case Study in a Large Public Sector Organization," in *Australasian Conference on Information Systems*, 2023, pp. 1–14. [Online]. Available: <https://aisel.aisnet.org/acis2023/144/>
- [23] B. H. C. and E. McMillan, "Analyzing the Current Trends in Enterprise Architecture Frameworks," *J. Enterp. Archit.*, vol. 9 (Februar, no. 1, pp. 1–4, 2013, doi: 10.1002/9781118785317.weom070020.
- [24] The Open Group, "The TOGAF Standard: Introduction and Core Concepts," TOGAF® Fundamental Content.
- [25] J.- Antouw and J. F. Andry, "Perancangan Enterprise Architecture Pada PT. Gadingputra Samudra Menggunakan Framework Togaf Adm," *J. Teknoinfo*, vol. 14, no. 2, p. 71, 2020, doi: 10.33365/jti.v14i2.642.
- [26] M. Rudyanto Arief, Netci Hesvindrati, Wing Wahyu Winarno, "Perancangan Arsitektur Teknologi Informasi pada Perusahaan Agrokompleks Menggunakan Pendekatan TOGAF ADM," *J. Teknol. Inf.*, vol. 16, no. 1, p. 54, 2021, doi: 10.35842/jtir.v16i1.389.
- [27] A. Haque *et al.*, "An Integrated Risk-Based Early Warning System to Increase Community Resilience Against Disaster," *Prog. Disaster Sci.*, vol. 21, pp. 1–19, 2024, doi: 10.1016/j.pdisas.2023.100310.
- [28] P. P. Widodo, V. W. Handayani, and D. Kurniawan, "Disaster Resilient Villages as a Level for Tsunami Preparedness," *ADJ Airlangga Dev. J.*, vol. 7, no. 2, pp. 129–133, 2023, doi: 10.20473/adj.v7i2.36042.
- [29] A. Gerber, P. le Roux, C. Kearney, and A. van der Merwe, *The Zachman Framework for Enterprise Architecture: An Explanatory is Theory*, vol. 12066 LNCS. Springer International Publishing, 2020. doi: 10.1007/978-3-030-44999-5_32.