

Enterprise Architecture to Support the Resolution of IT Governance Problems in Regional Banks

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Abstract– Digital transformation in the banking sector requires organizations to establish information technology governance that can align business strategy, processes, data, applications, and organizational structures. Bank XYZ, as a regional development bank, faces three main IT governance problems: application portfolio inefficiency, weak data governance, and limited organizational alignment. This study aims to analyze how the development of *Enterprise Architecture* (EA) can support the resolution of these three problems. This research applies a qualitative approach using a case study method. Data were collected through documentation studies of strategic documents, governance documents, application catalogues, data catalogues, as well as discussions and assessments involving business and IT units of Bank XYZ. The analysis was conducted by mapping the identified problems to relevant EA artifacts, evaluating their suitability using *COBIT 2019 APO03 Managed Enterprise Architecture*, and confirming the analysis results with relevant stakeholders. The findings show that EA supports the improvement of application portfolio inefficiency through the *application landscape* and *application communication diagram*, which provide visibility into application distribution, functions, and inter-system dependencies. In terms of data governance, the data architecture and *data catalogue* help clarify data domains, data definitions, and the relationship between data, business processes, applications, and organizational units. For organizational alignment, the cascading of EA artifacts from the *metamodel* to level 2 business processes and the demonstration of the *Event Driven Process Chain* show how processes, data, applications, and organizational units can be integrated within a single architectural framework. The APO03 evaluation indicates a capability score of 2.70, meaning that EA management has passed *Capability Level 2* but has not yet reached *Capability Level 3*. Stakeholder confirmation also indicates that the EA artifacts are considered suitable and relevant to the organization's needs, particularly in addressing the three IT governance problems. However, stakeholders expressed concerns regarding implementation, especially in ensuring that EA artifacts can be managed, updated, and used continuously. These findings indicate that EA can serve as an IT governance analysis instrument that helps organizations understand architectural complexity and determine improvement priorities more systematically. Therefore, Bank XYZ needs to strengthen its EA management policy, establish a *RACI matrix*, and develop an EA implementation plan integrated with organizational program and project governance.

Keywords: *Enterprise Architecture*, IT governance, *COBIT 2019*, APO03, regional development bank, application portfolio, data governance

1. INTRODUCTION

Digital transformation has become a strategic agenda for modern organizations because it is not only related to the adoption of technology, but also to changes in business processes, organizational structures, governance, and the way organizations create value. Digital transformation can be understood as the process of utilizing digital technology to change the way organizations operate and generate benefits for stakeholders [1]. However, the success of digital transformation is not solely determined by the technology used, but also by the organization's ability to align strategy, processes, human resources, and information technology [2]. This indicates that digital transformation requires strong information technology governance so that digital initiatives do not operate in isolation, remain measurable, and generate value in accordance with organizational objectives.

In practice, many organizations still face challenges in carrying out digital transformation effectively. Boston Consulting Group emphasizes that the success of digital transformation requires clear strategic direction, structured initiative management, and the organization's ability to integrate technology into core business processes [3]. Enterprise Architecture becomes one of the relevant approaches in this context because it can help organizations map the interrelationships between business strategy, processes, data, applications, and technology more systematically [4]. Thus, Enterprise Architecture does not only function as a technical design, but also as an instrument to strengthen alignment between business needs and information technology management.

The need for information technology governance is becoming increasingly important in the banking sector, including regional banks. Regional banks have specific characteristics because they do not only perform commercial functions, but also support regional economic development, transparency, and public accountability [5]. On the other hand, the banking industry is required to improve digital services, maintain regulatory compliance, manage risks, and ensure that information systems and data can support business processes in a secure, reliable, and integrated manner. Research in the banking context shows that Enterprise Architecture can help organizations address the demands of digitalization through system planning, process integration, and

technology alignment with business needs [6]. Another study on digital banking in Indonesia also shows that Enterprise Architecture can be used to design digital banking service architecture in a more structured manner [7]. Information technology governance fundamentally aims to ensure that information technology is able to deliver value to the organization, support business strategy, manage risks, and optimize the use of resources [8]. In COBIT 2019, Enterprise Architecture management is covered under the APO03 Managed Enterprise Architecture process, which emphasizes the importance of enterprise architecture as a foundation to support strategy, structure, processes, and information technology development consistently [9]. Therefore, Enterprise Architecture can be positioned as part of the IT governance mechanism that helps organizations direct change, manage complexity, and provide a more structured basis for decision-making.

Conceptually, Enterprise Architecture is viewed as a foundation for organizations to execute strategy through the interconnection between business processes, information systems, data, and technology [10]. The value of Enterprise Architecture does not only emerge from the existence of architecture documents or artifacts, but from how those artifacts are used to support coordination, communication, and organizational decision-making [11]. Enterprise Architecture management also needs to be carried out continuously so that architecture artifacts remain relevant to organizational needs and can support both business and technological change [12]. In other words, Enterprise Architecture needs to be understood as a managerial and governance approach, not merely as technical documentation.

This study takes Bank XYZ as a case study, namely a regional bank that faces three main problems in information technology governance. The first problem is application portfolio inefficiency, characterized by application complexity, potential functional duplication, and the need to view interrelationships among applications more comprehensively. The second problem is weak data governance, which relates to the need for data structures, data definitions, and the relationship between data, business processes, and applications. The third problem is limited organizational alignment, reflected in the need to connect strategy, business processes, organizational functions, data, applications, and information technology within a consistent architectural framework.

Tamm et al., through the Enterprise Architecture Benefit Model, explain that the quality of Enterprise Architecture can generate organizational benefits through four benefit enablers, namely organisational alignment, information availability, resource portfolio optimisation, and resource complementarity [13]. These four benefits are relevant to the context of Bank XYZ. The problem of limited organizational alignment requires organisational alignment, weak data governance requires information availability, application portfolio inefficiency requires resource portfolio optimisation, while the need for integration across processes, data, applications, and work units requires resource complementarity. Thus, Enterprise Architecture has a strong conceptual basis to be analyzed as an instrument for resolving IT governance problems.

Based on these problems, this study focuses on analyzing how the development of Enterprise Architecture supports the resolution of three IT governance problems at Bank XYZ. This study does not position Enterprise Architecture merely as a technical design, but as an IT governance instrument that helps the organization understand problems, map interrelationships across architectural domains, and provide a more structured evaluation basis through an analytical process with stakeholders. In addition to descriptive qualitative analysis, the evaluation is also conducted by referring to COBIT 2019 APO03 and through stakeholder confirmation to assess the substantive suitability of the artifacts and their relevance to organizational needs. Therefore, the research question in this study is: RQ1: How can the development of Enterprise Architecture (EA) contribute to supporting the resolution of the three main IT governance problems at Bank XYZ, namely application portfolio inefficiency, weak data governance, and limited organizational alignment, through an architectural analysis process with Bank XYZ stakeholders?

2. RESEARCH METHODOLOGY

2.1 Research Approach

This study employs a qualitative approach with a case study method because it aims to gain an in-depth understanding of how the development of Enterprise Architecture contributes to supporting the resolution of IT governance problems within the specific context of Bank XYZ. The qualitative approach is used to explore organizational phenomena contextually through the interpretation of documents, discussion results, and analytical processes with stakeholders, while the case study method is selected because this research focuses on a single organizational object with specific and complex IT governance problems [14], [15].

2.2 Object, Unit of Analysis, and Data Source

The object of this study is Bank XYZ as one of the regional banks facing three main IT governance problems, namely application portfolio inefficiency, weak data governance, and limited organizational alignment. The units of analysis in this study include business units, information technology units, strategic documents, governance

documents, Enterprise Architecture artifacts, COBIT 2019 APO03 evaluation results, and confirmation results with stakeholders. The data sources in this study consist of secondary data and primary data. Secondary data were obtained through documentation studies of Bank XYZ's internal documents, as shown in Table 1.

Table 1. Secondary Data Source

No	Document	Objective
1	Long-Term Corporate Plan of Bank XYZ	As an initial document for aligning the company's business direction with EA.
2	IT Strategic Plan of Bank XYZ	As an initial document for aligning strategy and providing an overview of application architecture, infrastructure, and IT governance with EA.
3	Organizational Structure, Main Duties, and Organizational Functions of Bank XYZ	As an overview of Bank XYZ's organizational structure for mapping stakeholders related to business process owners at Bank XYZ.
4	Existing Application Catalogue or List of Applications of Bank XYZ	As an overview of the existing application governance condition at Bank XYZ to be further analyzed within the System Information (Application) area of EA.
5	Existing Data Catalogue, Schema, and Data Architecture of Bank XYZ	As an overview of the existing data governance condition at Bank XYZ to be further analyzed within the System Information (Data) area of EA.

Meanwhile, the primary data are described in Table 2.

Table 2. Primary Data Source

No	Unit	Data Collecting Methods
1	Unit that manages corporate strategic planning	On-site FGD at Bank XYZ Office
2	Unit that manages corporate IT	On-site FGD at Bank XYZ Office
3	Unit that manages corporate applications	On-site FGD at Bank XYZ Office
4	Unit that manages corporate data governance	On-site FGD at Bank XYZ Office
5	Unit that manages digital innovation	On-site FGD at Bank XYZ Office

2.3. Research Stages

The research stages were developed to describe the process flow of EA development in supporting the resolution of IT governance problems at Bank XYZ. As shown in Figure 1, the research begins with the formulation of the research problem, followed by three main phases. The first phase is the initial study and data collection strategy using the EA framework through assessment of the business unit and IT unit of Bank XYZ to produce a synthesis of the three main IT governance problems. The second phase is the analysis of EA support for the three problems, EA evaluation using COBIT 2019 APO03, and confirmation of the analysis results with Bank XYZ stakeholders. The third phase is the formulation of research conclusions and recommendations.

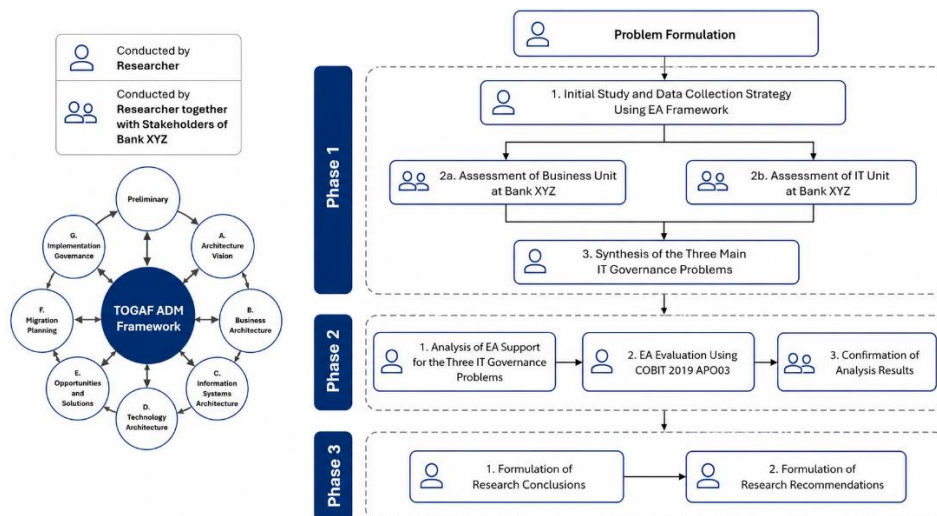


Figure 1. Research Stages

2.4. Data Analysis Technique

The data analysis technique was conducted qualitatively through the processes of data reduction, data presentation, and conclusion drawing. Data reduction was carried out by categorizing the results of documentation studies, interviews, focused discussions, and organizational assessments into three problem areas, namely application portfolio inefficiency, weak data governance, and limited organizational alignment. Data presentation was conducted by mapping the findings to relevant Enterprise Architecture artifacts, such as application, data, business process, and organizational structure artifacts. Subsequently, conclusion drawing was performed by evaluating EA support using COBIT 2019 APO03 and confirming the analysis results with Bank XYZ stakeholders to ensure the substantive suitability of the artifacts and their relevance to organizational needs [9], [16].

3. RESULTS & DISCUSSION

3.1 Phase 1: Assessment and Synthesized Bank XYZ IT Governance Problem

Referring to the TOGAF ADM framework, the assessment process was conducted to obtain an initial understanding of the organization's architectural condition, ranging from architecture vision, business architecture, to information systems architecture [17]. Therefore, the units analyzed were not limited to either the business side or the IT side separately, but had to be able to provide a comprehensive overview of the interrelationships between strategic direction, business processes, applications, data, and IT governance at Bank XYZ. In this study, the assessment was conducted on the business unit, consisting of the strategic planning unit, and the IT units, consisting of the information system technology unit, digital innovation unit, application support unit, and data management unit. The selection of these units was based on their involvement in strategic planning, infrastructure and application management, digital innovation development, and corporate data management. Before the assessment was conducted, strategic and governance documents such as the RJPP, ITSP, SOTK, and application and data catalogues had been received by the author and served as the basis for the assessment and question design. In accordance with the scope of the study, the assessment results indicate that there are three main IT governance problems that become the focus of the analysis, namely application portfolio inefficiency, weak data governance, and limited organizational alignment. A summary of the assessment results is presented in Table 3.

Table 3. Synthesis of IT Governance Problems at Bank XYZ

Assessment Unit	Reason for Unit Assessment	Bank XYZ IT Governance Problem		
		Application Portfolio Inefficiency	Weak Data Governance	Limited Organizational Alignment
Business Unit				
Strategic Planning Unit	This unit was analyzed because it has a role in determining strategic direction, initiative priorities, and IT investments that directly affect IT portfolio management and business performance.	1. Applications do not yet fully support strategic priorities. 2. There is potential functional overlap among applications. 3. Evaluation and application rationalization criteria have not been clearly defined.	1. Strategic data needs have not been consistently defined. 2. Data has not been optimally used as a basis for strategic decision-making.	1. IT initiatives are not yet fully aligned with business targets. 2. Prioritization and cross-functional communication mechanisms have not been effective.
IT Unit				
Information System Technology Unit	This unit was analyzed because it is responsible for managing infrastructure, core applications, system integration, and the	1. Application duplication and complexity are relatively high. 2. Integration between systems is not yet fully	1. Data standards and metadata are not yet consistent. 2. Data quality has not been adequately monitored.	1. Structures and roles do not yet fully support end-to-end collaboration. 2. Service Level Agreements and

Assessment Unit	Reason for Unit Assessment	Bank XYZ IT Governance Problem		
		Application Portfolio Inefficiency	Weak Data Governance	Limited Organizational Alignment
	operational foundation of IT at Bank XYZ.	optimal, making application management increasingly complex.		Key Performance Indicators across units have not been integrated.
Digital Innovation Unit	This unit was analyzed because it plays a role in developing new digital solutions to drive innovation and transformation.	1. Digital application initiatives are often developed outside the corporate architecture. 2. Reuse of shared components and platforms is not yet optimal.	1. There are data silos between digital initiatives and core systems. 2. Data governance in innovation projects has not been integrated with corporate data governance.	1. Coordination between business units and operational IT units is not yet optimal. 2. Digital project governance mechanisms have not been consistently implemented.
Application Support Unit	This unit was analyzed because it is responsible for operating and supporting applications to ensure service stability.	1. There are still legacy applications with relatively high maintenance costs. 2. System improvement priorities are not yet based on business value and operational impact.	1. Data definitions across applications are not yet uniform. 2. Data quality issues are often identified only after disrupting operational processes.	1. Escalation mechanisms and cross-unit issue ownership are not yet clear. 2. Application documentation and knowledge management have not been optimally managed.
Unit Manajemen Data	This unit was analyzed because it has a role in managing data so that it can be used accurately, securely, consistently, and meaningfully for the organization.	1. Much data is not used optimally but remains stored in the system. 2. Data infrastructure is not yet fully efficient in supporting organizational needs.	1. Data governance is not yet comprehensive in terms of policies, standards, and monitoring. 2. Lineage, ownership, and master data management (MDM) are not yet mature.	1. The role of data owners has not been effectively implemented. 2. A data-driven decision-making culture is not yet evenly distributed across all organizational units.

The three problems presented in the table indicate that Bank XYZ requires an architectural framework capable of providing visibility into applications, clarifying data structures and management, and connecting business strategy with processes, organization, and information technology. Therefore, the following section explains how the developed Enterprise Architecture artifacts can support the resolution of each problem in a more structured manner.

3.2 Phase 2: Analysis and Evaluation of Enterprise Architecture Support

In the second phase, the analysis is directed toward assessing how the developed Enterprise Architecture artifacts can support improvements in IT governance at Bank XYZ. The discussion is conducted by linking each EA artifact to the three main problems identified in the previous phase, namely application portfolio inefficiency, weak data governance, and limited organizational alignment. Through this approach, EA artifacts are not only understood as modeling outputs, but also as an analytical basis for examining the interrelationships among applications, data, business processes, and organizational units.

3.2.1 Analysis of EA Support for IT Governance Improvement

a) Analysis of EA Support for Improving Application Portfolio Inefficiency

The problem of application portfolio inefficiency at Bank XYZ is related to the complexity of the number of applications, potential functional overlap, and limited visibility into relationships among applications. In this context, EA plays a role in providing an application architecture map that can be used to understand the scope, functions, and interrelationships of applications in a more structured manner.

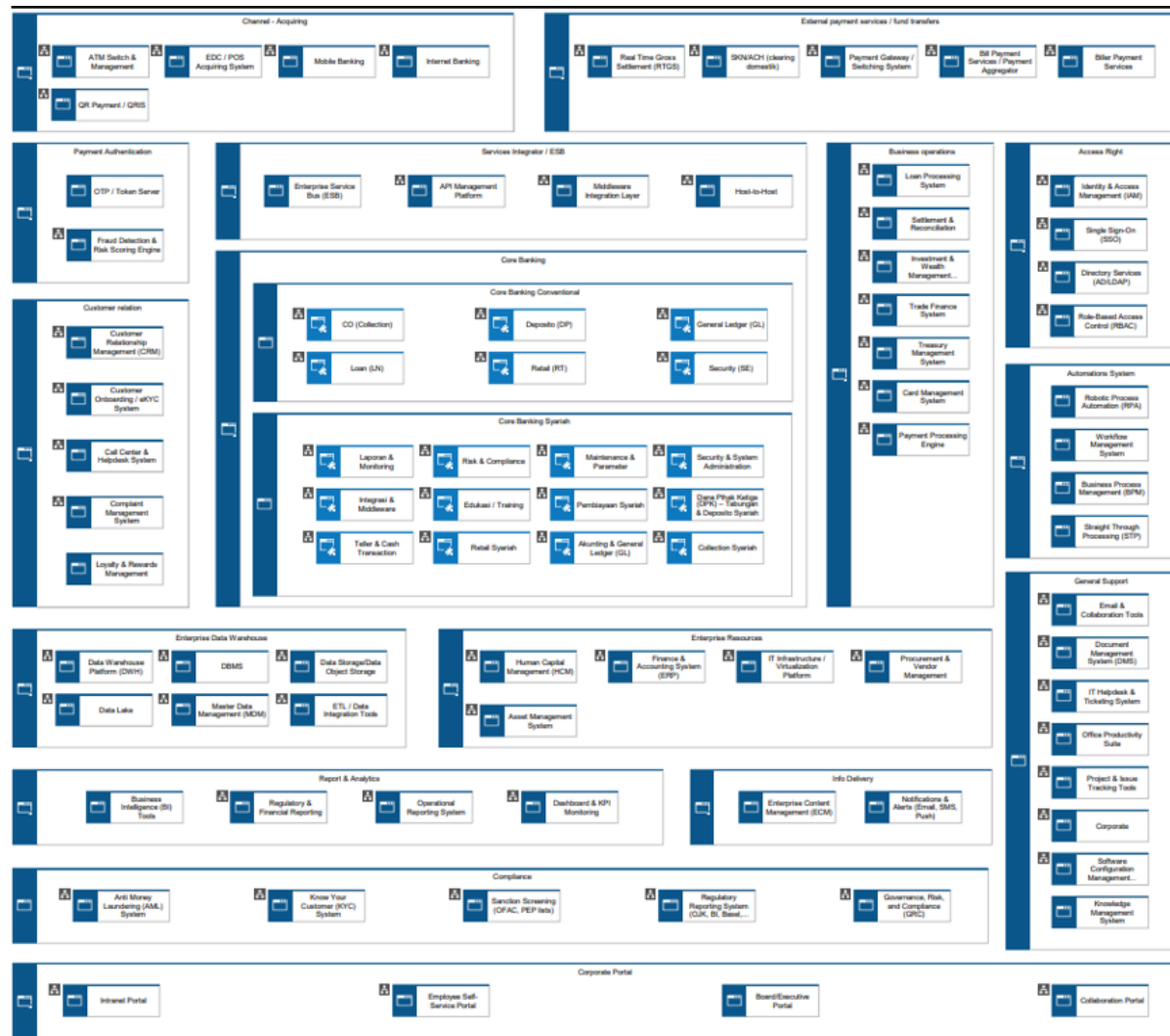


Figure 2. Application Landscape

Figure 2 shows the application landscape of Bank XYZ, which maps applications into several functional groups, such as channels, external services, servicing integrator, core banking, business operations, access and security, reporting, analytics, general services, and corporate portals. This artifact helps the organization view applications not merely as a list of standalone systems, but as part of the company's application landscape that collectively supports business processes. Thus, the application landscape provides initial visibility to identify areas that may have functional duplication, high complexity, or application rationalization needs.

In addition to understanding the distribution of applications, Bank XYZ also needs to understand the relationships and dependencies between systems. This is important because application portfolio inefficiency is not only caused by the number of applications, but also by integration complexity that has not been adequately documented. For this purpose, EA provides an application communication diagram that illustrates the communication patterns among key applications.

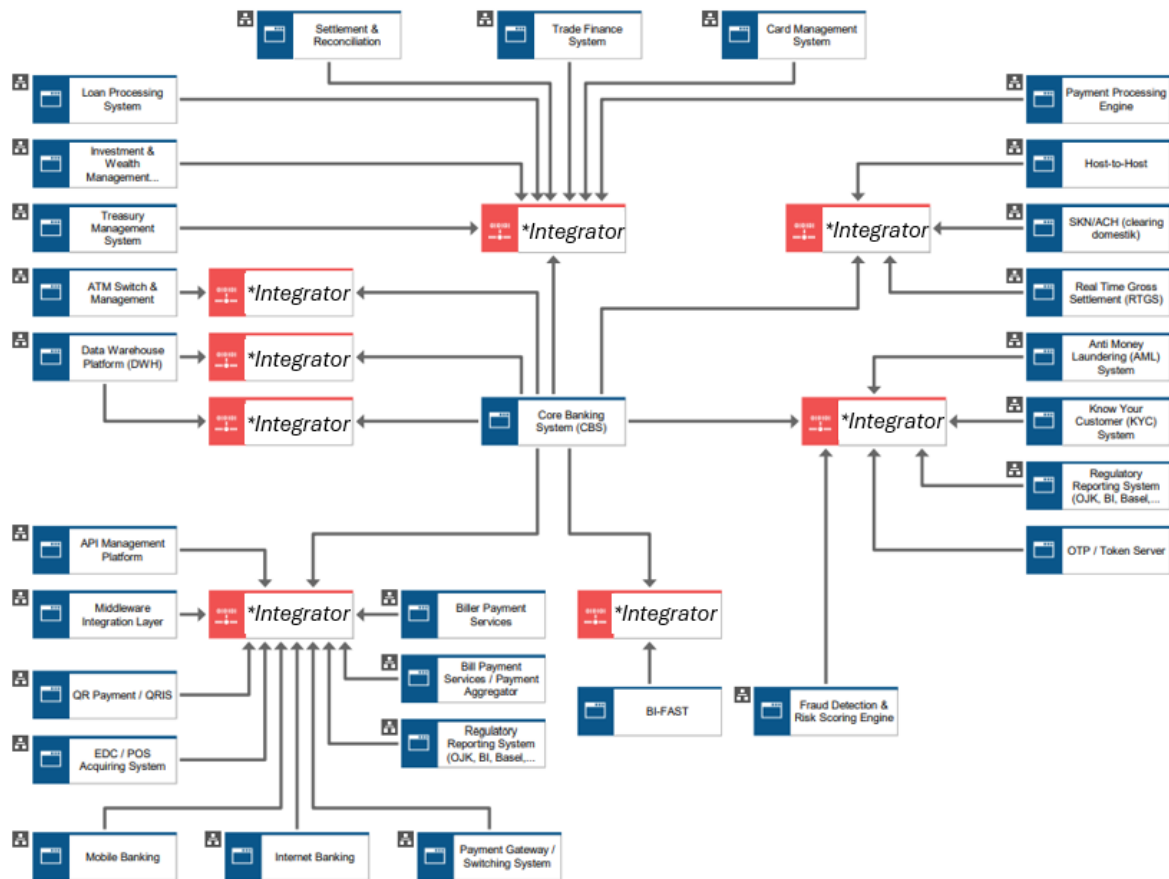


Figure 3. Application Communication Diagram

Figure 3 shows the application communication diagram of Bank XYZ, which illustrates the position of the Core Banking System (CBS) as the core system connected to various other applications, such as loan processing system, card management system, payment processing engine, host-to-host, mobile banking, internet banking, API management platform, middleware integration layer, and regulatory reporting systems. This diagram helps the organization understand critical integration points, applications with high dependencies, and areas that may create operational complexity if not managed in a standardized manner.

Based on these two artifacts, EA supports the improvement of application portfolio inefficiency through two main mechanisms. First, the application landscape provides visibility into the distribution and scope of applications. Second, the application communication diagram explains the relationships and dependencies among applications. The combination of these two artifacts provides an architectural information basis to support decisions related to application rationalization, consolidation, integration, and development prioritization in a more directed manner.

b) Analysis of EA Support for Improving Data Governance

The problem of data governance at Bank XYZ is related to the limited mapping of data structures, data definitions, and the relationship between data, business processes, applications, and organizational units. In this context, EA plays a role in providing data architecture artifacts that can clarify the position of data as an organizational asset.

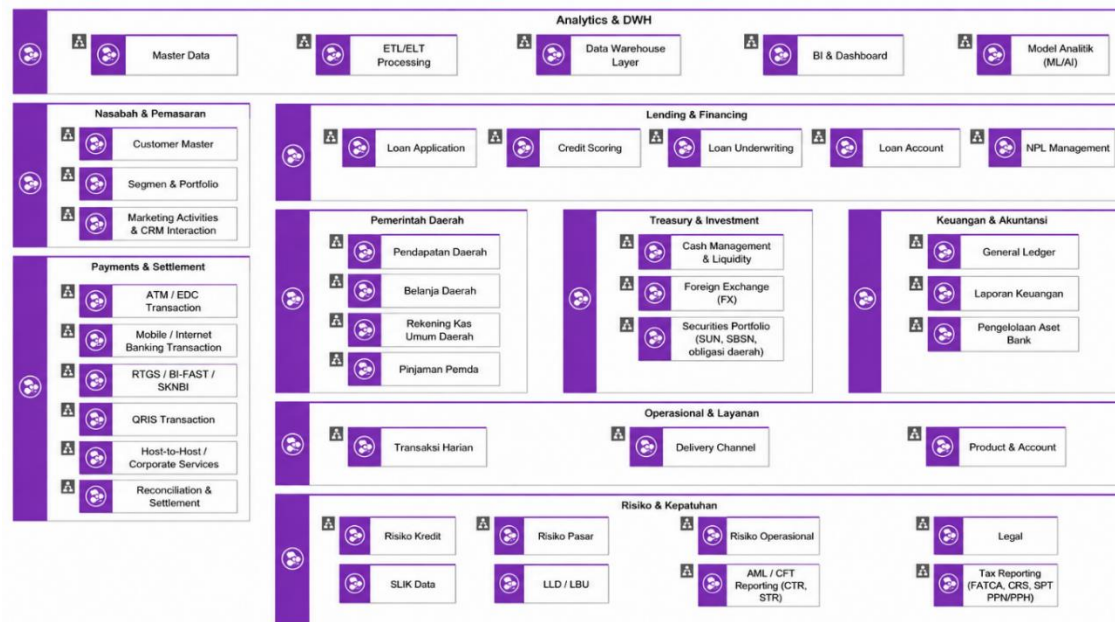


Figure 4. Data Architecture

Figure 4 shows the data architecture of Bank XYZ, which groups data into several main domains, such as Analytics and Data Warehouse, customers and marketing, payments and settlement, lending and financing, local government, treasury and investment, finance and accounting, operations and services, as well as risk and compliance. This mapping helps the organization view data distribution in a more structured manner based on the bank's business areas and main functions. Thus, data architecture can serve as an initial basis for identifying critical data domains, the relationship between data and business activities, and priorities for strengthening data governance.

However, data architecture does not stand alone. Each data entity needs to be linked through EA tools with other artifacts, such as business processes, process-owning units or divisions, data-managing applications, and data exchange flows between systems. This interconnection is important so that the organization can clarify the ownership, lineage, and metadata of each data element used. Thus, data governance does not stop at a list of data, but develops into a management mechanism that explains who owns the data, where the data comes from, how the data is processed, which applications manage it, and which business processes use it.

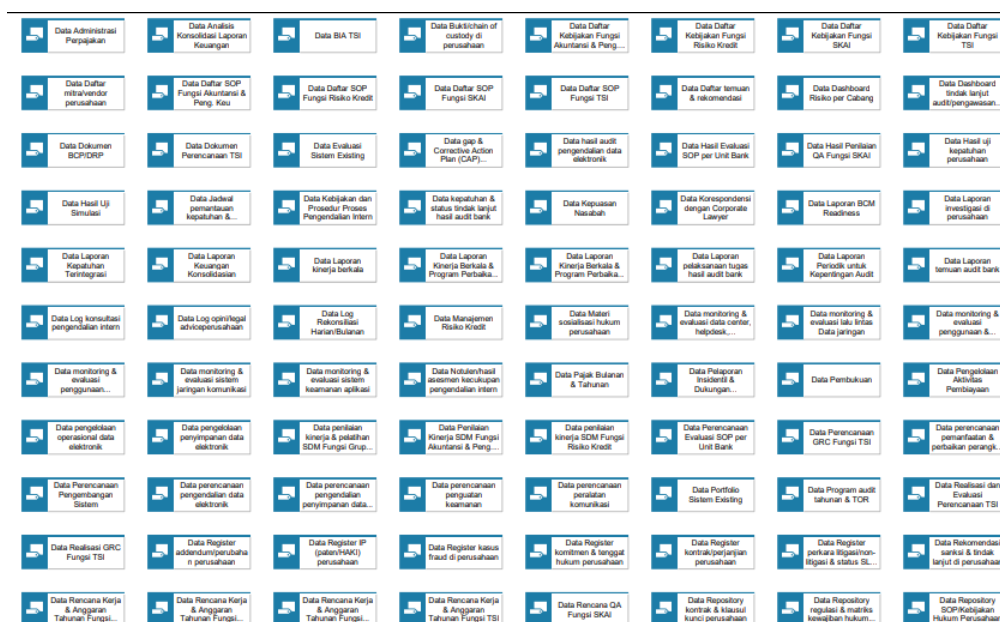


Figure 5. Data Catalogue

Figure 5 shows the data catalogue of Bank XYZ, which documents various data elements used within the organization. This artifact functions to clarify the list of data, definitions, classifications, and usage contexts. Through the data catalogue, the organization can reduce ambiguity in the use of data terms, improve consistency of definitions across units, and strengthen the foundation for managing data across applications and business processes.

Based on these two artifacts, EA supports the improvement of data governance through two main mechanisms. First, data architecture provides a data domain structure that helps the organization understand data distribution and interrelationships comprehensively. Second, the data catalogue provides more detailed data documentation so that ownership, lineage, and metadata can be managed more clearly. The combination of these two artifacts strengthens data governance because data is no longer viewed as a technical object scattered across various applications, but as an organizational asset connected to business processes, owning units, applications, and decision-making needs.

c) Analysis of EA Support for Organizational Alignment

The problem of limited organizational alignment at Bank XYZ is related to the suboptimal relationship between strategy, business processes, organizational units, data, applications, and IT initiatives. In this context, EA serves as a framework that connects various organizational elements so that IT development and management can be more clearly traced to business needs.

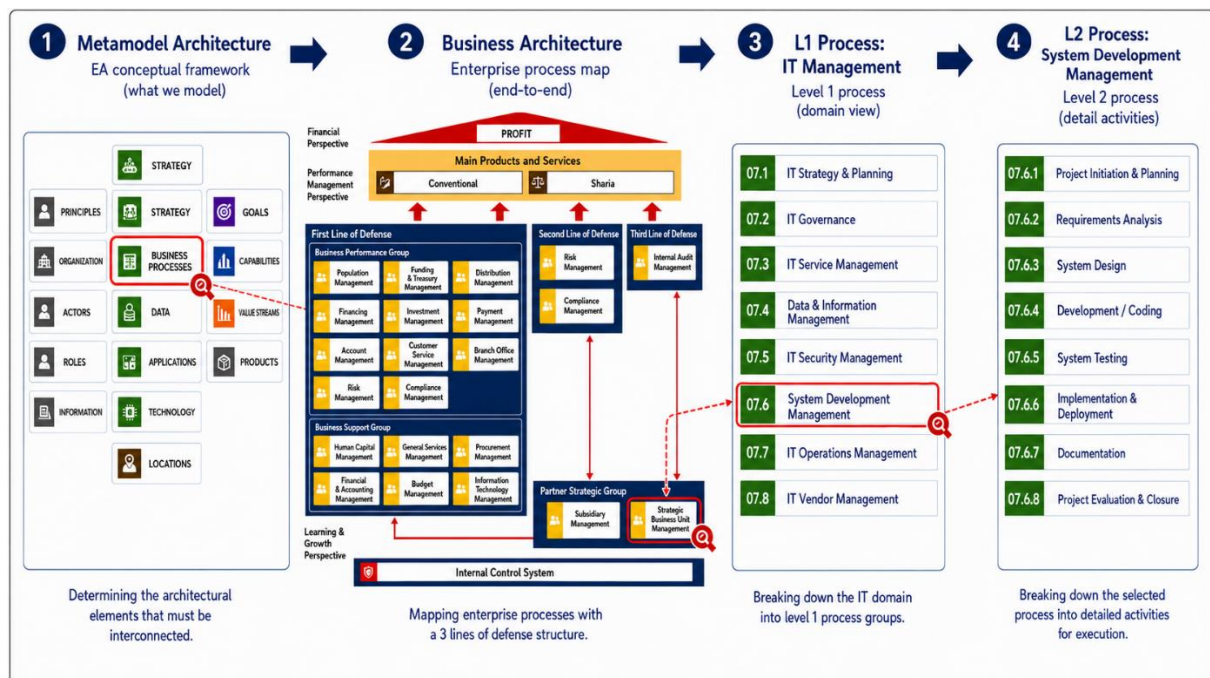


Figure 6. Cascading EA Artifacts from the Metamodel to Level 2 Business Processes

Figure 6 shows the cascading flow of EA artifacts, starting from the architecture metamodel, business architecture, L1 process of TSI management, to L2 process of system development management. This artifact shows that EA development does not only produce a conceptual map but also translates the relationships among architectural elements into more operational processes. Through the metamodel, the organization can determine the elements that need to be interconnected, such as business processes, data, applications, actors, roles, and capabilities. Furthermore, business architecture maps enterprise processes in an end-to-end manner, while L1 and L2 processes clarify the domains and more detailed activities required to support execution.

This tiered mapping supports the improvement of organizational alignment because each IT process can be traced in relation to the organizational structure, business needs, and other architectural artifacts. Thus, EA helps reduce the risk of IT initiatives running partially or being disconnected from organizational direction. This artifact also shows that organizational alignment is not only carried out at the strategic level, but also needs to be translated into interconnected processes, roles, data, and applications.

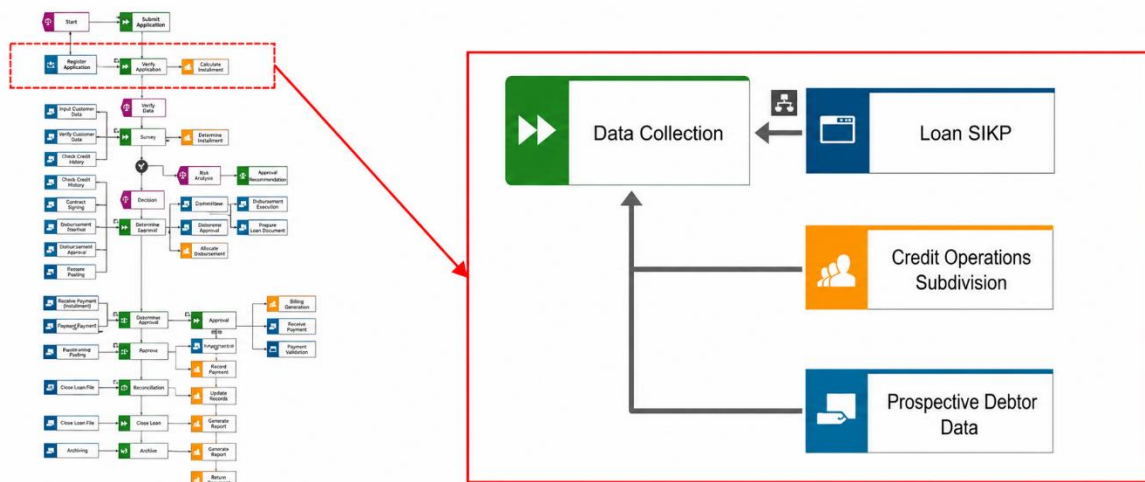


Figure 7. Event Driven Process Chain Demonstration at Loan Process

Figure 7 shows the demonstration of the Event Driven Process Chain in the loan process, which integrates aspects of business processes, data, applications, and organizational units within a single analytical layer. In this example, the data collection activity is not only understood as a process activity, but is also linked to the Loan SIKP application, the Credit Operations Sub-Division, and prospective debtor data. This relationship shows that a business activity can have direct links with the system used, the data processed, and the organizational unit responsible for it.

The Event Driven Process Chain artifact supports organizational alignment because it is able to show operational relationships across architectural domains more concretely. This is also continuous with the two previous problems. From the application portfolio perspective, this artifact shows which applications are used in a particular process. From the data governance perspective, this artifact shows which data are used or generated in business activities. From an organizational perspective, this artifact explains which units or roles are responsible for process execution. Thus, EA helps Bank XYZ establish interconnections between strategy, processes, applications, data, and organization within a more consistent framework.

Based on these two artifacts, EA supports the improvement of organizational alignment through two main mechanisms. First, the cascading of artifacts from the metamodel to level 2 business processes helps translate architectural direction into more operational processes. Second, the Event Driven Process Chain shows the interconnection between processes, data, applications, and organizational units at the activity level. The combination of these two artifacts strengthens the role of EA as an organizational alignment instrument because IT decisions and initiatives can be traced to business processes, data needs, supporting applications, and responsible units.

3.2.2 Evaluation of Enterprise Architecture Suitability

Enterprise Architecture evaluation was conducted to assess the extent to which the development of EA has supported enterprise architecture management in accordance with the APO03 Managed Enterprise Architecture practice in COBIT 2019. The assessment was carried out by mapping Bank XYZ's EA activities and artifacts against the APO03 key management practices, then evaluating the level of fulfillment using the NPLF scale, namely Not Achieved (N), Partially Achieved (P), Largely Achieved (L), and Fully Achieved (F). This mechanism is used to identify which practices have been adequately fulfilled and which practices still have opportunities for improvement (OFI), so that EA management can be strengthened in a more formal, consistent, and sustainable manner.

Table 4. Capability Level 2 Assessment

Practice Code	Assessment Focus	Category	Score
APO03.01	Development of enterprise architecture vision	Fully (F)	1.00
APO03.01	Identification of enterprise goals and strategic drivers	Fully (F)	1.00
APO03.01	Alignment of architecture objectives with strategic programs	Fully (F)	1.00
APO03.01	Understanding of enterprise capabilities and objectives	Fully (F)	1.00
APO03.01	Assessment of organizational change readiness	Fully (F)	1.00

Practice Code	Assessment Focus	Category	Score
APO03.01	Definition of baseline and target architecture scope	<i>Largely</i> (L)	0.67
APO03.01	Integration of EA into enterprise strategic planning	<i>Fully</i> (F)	1.00
APO03.01	Development of architecture vision based on stakeholder needs	<i>Largely</i> (L)	0.67
Capability Level 2 Score			0.92

Table 5. Capability Level 3 Assessment

Practice Code	Assessment Focus	Category	Score
APO03.01	Architecture principles	<i>Largely</i> (L)	0.67
APO03.01	Architecture change risks	<i>Partially</i> (P)	0.33
APO03.01	Architecture concept business case	<i>Fully</i> (F)	1.00
APO03.02	Architecture repository	<i>Fully</i> (F)	1.00
APO03.02	Architecture viewpoints	<i>Fully</i> (F)	1.00
APO03.02	Architecture models	<i>Fully</i> (F)	1.00
APO03.02	Description of baseline architecture domains	<i>Fully</i> (F)	1.00
APO03.02	Process architecture model	<i>Fully</i> (F)	1.00
APO03.02	Information architecture model	<i>Fully</i> (F)	1.00
APO03.02	Model verification and gap analysis	<i>Partially</i> (P)	0.33
APO03.02	Formal stakeholder review	<i>Fully</i> (F)	1.00
APO03.02	Finalization of architecture domains	<i>Largely</i> (L)	0.67
APO03.03	Organizational change attributes	<i>Largely</i> (L)	0.67
APO03.03	Implementation drivers and constraints	<i>Largely</i> (L)	0.67
APO03.03	Consolidation of gap analysis results	<i>Partially</i> (P)	0.33
APO03.03	Identification of minimum functional requirements	<i>Partially</i> (P)	0.33
APO03.03	Reconciliation of requirements and solutions	<i>Largely</i> (L)	0.67
APO03.03	Dependency analysis and migration constraints	<i>Largely</i> (L)	0.67
APO03.03	Transformation readiness and risks	<i>Largely</i> (L)	0.67
APO03.03	Implementation and migration strategy	<i>Largely</i> (L)	0.67
APO03.03	Work package grouping	<i>Largely</i> (L)	0.67
APO03.03	Transition architecture	<i>Largely</i> (L)	0.67
APO03.04	Implementation and migration plan	<i>Largely</i> (L)	0.67
APO03.04	Transition architecture phases	<i>Largely</i> (L)	0.67
APO03.04	Integration of implementation plan with program governance	<i>Largely</i> (L)	0.67
APO03.04	Communication of the architecture roadmap	<i>Largely</i> (L)	0.67
APO03.05	Guidance for solution development and implementation	<i>Partially</i> (P)	0.33
APO03.05	Management of architecture requirements	<i>Largely</i> (L)	0.67
APO03.05	Management of the enterprise architecture service portfolio	<i>Largely</i> (L)	0.67
Capability Level 3 Score			0.70

Based on the evaluation results, the development of EA at Bank XYZ achieved a capability score of 2.70. This achievement indicates that EA management has passed Capability Level 2 but has not yet reached Capability Level 3, as the minimum threshold to be considered well-established is 3.00. To reach this level, Bank XYZ needs to strengthen several key areas, namely the formalization of EA principles and management policies on an enterprise-wide basis, the establishment of a RACI matrix to clarify roles and responsibilities in EA management, the strengthening of risk analysis and cross-domain architecture gap analysis, and the development of an EA implementation plan integrated with the organization's program and project governance.

In addition, the analysis results and the Enterprise Architecture artifacts that had been developed were subsequently confirmed with the relevant stakeholders at Bank XYZ. This confirmation was conducted to ensure that the EA artifacts were not only appropriate in terms of modeling structure, but also substantively relevant to organizational needs. In general, stakeholders assessed that the EA artifacts were able to represent the condition and needs of Bank XYZ, particularly in addressing the three main IT governance problems, namely application portfolio inefficiency, weak data governance, and limited organizational alignment.

The main points regarding the confirmation results are as follows:

1. The EA artifacts were considered to provide better visibility into the application portfolio, inter-system relationships, data structures, business processes, and the organizational units involved.

2. Stakeholders assessed that EA was substantively appropriate because it was able to connect business and IT needs within a more structured architectural framework.
3. The main concern of stakeholders did not lie in the suitability of the artifacts, but rather in how these artifacts could be implemented, managed, and continuously updated.

Thus, the confirmation results indicate that the development of EA is viewed as relevant as an instrument to support the resolution of IT governance problems at Bank XYZ. However, concerns regarding implementation show that the success of EA does not only depend on the quality of the artifacts, but also on the existence of further governance mechanisms, such as EA management policies, role allocation through a RACI matrix, and a clear and measurable implementation plan.

4. CONCLUSION

This study shows that the development of Enterprise Architecture (EA) plays a role in supporting the resolution of three main IT governance problems at Bank XYZ, namely application portfolio inefficiency, weak data governance, and limited organizational alignment. Through an architectural analysis process with stakeholders, EA is able to provide a more structured mapping of the relationships between strategy, business processes, data, applications, and organizational units. Thus, EA does not only function as technical documentation, but also as a governance instrument that helps the organization understand IT complexity and provides a more directed basis for decision-making.

In addressing application portfolio inefficiency, EA provides support through application landscape and application communication diagram artifacts that show application distribution, application functions, and inter-system dependencies. These artifacts help the organization gain visibility into application portfolio complexity as a basis for evaluating, consolidating, integrating, and rationalizing applications. In addressing data governance problems, EA provides support through data architecture and data catalogue artifacts that clarify data domain structures, data definitions, and the relationships between data, business processes, applications, and organizational units. This strengthens the basis for managing ownership, lineage, and metadata so that data can be understood as an organizational asset that needs to be managed consistently. Meanwhile, in addressing organizational alignment problems, EA provides support through the cascading of artifacts from the metamodel to level 2 business processes, as well as the demonstration of the Event Driven Process Chain, which is able to integrate business process, data, application, and organizational unit aspects within a single analytical layer.

The evaluation results using COBIT 2019 APO03 show that the development of EA at Bank XYZ achieved a capability score of 2.70. This achievement indicates that EA management has passed Capability Level 2 but has not yet reached Capability Level 3, as the minimum threshold to reach that level is 3.00. To achieve Capability Level 3, Bank XYZ needs to strengthen EA management through the formalization of EA principles and policies on an enterprise-wide basis, the establishment of a RACI matrix to clarify roles and responsibilities, the strengthening of risk analysis and cross-domain architecture gap analysis, and the development of an EA implementation plan integrated with organizational program and project governance. These efforts are necessary so that EA is not only available as a set of artifacts, but can also be managed as an organizational capability that is documented, measurable, and sustainable.

Furthermore, stakeholder confirmation shows that the EA artifacts were considered substantively appropriate and relevant to organizational needs, particularly in supporting the resolution of the three IT governance problems. However, stakeholders still expressed concerns regarding implementation, particularly regarding how EA artifacts can be managed, updated, and used continuously in the decision-making process. Based on these findings, this study recommends that Bank XYZ strengthen its EA management mechanism through EA management policies, clear role allocation, and a phased and measurable implementation plan. Future research may examine the effectiveness of EA implementation after the artifacts are used in organizational decision-making processes, so that EA benefits are not only assessed based on artifact suitability, but also based on their impact on sustainable IT governance improvement.

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