

COMPARATIVE ANALYSIS OF ENTERPRISE ARCHITECTURE FRAMEWORKS USING TOGAF ADM AND SPBE ARCHITECTURE BASED ON PRESIDENTIAL REGULATION NO. 132 OF 2022

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ABSTRACT

This research aims to conduct a comparative analysis between two enterprise architecture frameworks: TOGAF ADM and Electronic-Based Government System Architecture (SPBE) based on Presidential Regulation No. 132 of 2022. TOGAF ADM is a framework commonly used in various types of organizations in the private and public sectors, while the SPBE Architecture is specifically designed for the Indonesian government sector. Through a qualitative descriptive approach, this study analyzes the principles, concepts, processes, and guidelines underlying each framework. This research is expected to provide insight for policy makers and enterprise architecture practitioners in choosing and implementing the framework that best suits the context and needs of their organization. In addition, this study also provides recommendations to improve the efficiency and effectiveness of implementing enterprise architecture in the public and private sectors in Indonesia. As well as its contribution to the efficiency and quality of government services. This research reviews the challenges in implementing the Electronic-Based Government System (SPBE) in Indonesian government institutions and proposes a solution by comparing TOGAF ADM and SPBE Architecture based on Presidential Regulation No. 132 of 2022. The motivation for this study is to improve the effectiveness and efficiency of SPBE implementation by selecting the most suitable framework. The method used involves analyzing structure, flexibility, technology integration, regulatory compliance, practical implementation, performance, and case studies. The results show that the implementation of TOGAF ADM and SPBE Architecture has their respective strengths and weaknesses, but a combination of both can achieve better outcomes in enhancing government performance and efficiency.

KEYWORDS *enterprise architecture, TOGAF framework, TOGAF ADM, electronic-based government system, architecture SPBE*



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INTRODUCTION

The Indonesian government has implemented the Electronic-Based Government System (SPBE) to improve public service quality and governance. However, this implementation faces various challenges such as system integration, business process standardization, and regulatory compliance. Evidence shows that many government institutions have yet to achieve an optimal SPBE index, indicating the need for an effective solution to address these issues.

Previous studies show that TOGAF ADM is widely used for designing Enterprise Architecture in various sectors, including government. A study by the Tasikmalaya Regency Government (Yustisiawandana & Aji, 2024) indicates that a low SPBE index can be improved using TOGAF ADM. Meanwhile, the SPBE Architecture based on Presidential Regulation No. 132 of 2022 has been implemented in Cirebon Regency (Wibowo & Firmansyah, 2023) (Suhendry & Firmansyah, 2023) (Niniekasari & Firmansyah, 2023) but still faces challenges in application effectiveness.

Other research by the West Java Provincial Government (Angelina, Tiofenny Fajrillah & Hanafi, 2022) and Sukabumi Regency (Pratama et al., 2021) also shows varied results in the implementation of these frameworks. Additionally, studies by the Kuningan Regency Government (Putri, Vina Dwiana Gumilang & Nugraha, 2021) (Kuru, Gede Sudanta Nethan Gumilang & Nugraha, 2021) and the West Java Housing and Settlement Agency (Saharah, Nesya Viola Falahah & Maulidya, 2020) (Fathoni, Maulana Muhammad Falahah & Izzati, 2020) indicate that combining TOGAF ADM and SPBE Architecture can improve service quality and accountability.

This study aims to identify and compare the main elements of TOGAF ADM and SPBE Architecture based on Presidential Regulation No. 132 of 2022, evaluate the effectiveness of both frameworks, and identify their strengths and weaknesses. The contribution of this research is to provide recommendations for more effective implementation of both frameworks, thereby improving the performance and efficiency of government institutions.

RESEARCH METHOD

Dataset

The dataset used in this study includes SPBE index data from various government institutions, enterprise architecture planning and implementation documents, and application performance evaluation results.

The comparative analysis conducted includes:

- 1) Identifying comparison criteria such as framework structure, flexibility, scalability, support for technology integration, and compliance with regulations.
- 2) Conducting comparative analysis based on the determined criteria.

- 3) Compiling a comparison matrix to visualize the results of the comparison.



Figure. 1. Method Steps

Method Steps

1. **Analysis of Framework Structure and Composition:** Comparing the main elements of TOGAF ADM and SPBE Architecture.
To understand how each framework is built and organized, including its phases and key components. It is important to know the scope and approach used by each framework in developing enterprise architecture.
The criteria used are: Objectives, Main Phases/Features, Approach, Flexibility, Main Components, Level of Standardization, Implementation Approach, Complexity, Scalability and Documentation and Guidance.
2. **Flexibility and Adaptability:** Evaluating the ability of both frameworks to adapt to technological changes and organizational needs.
To assess the extent to which each framework can be tailored to the specific needs of the organization and is able to adapt to changes in the business and technology environment. This is important to determine which framework is more dynamic and suitable for a changing environment.
The criteria used are: Flexibility, Adaptability, Customization, Use in Various Industries, Response to Change, Openness to Integration, Global Acceptance, Scalability, and Learning and Training.
3. **Technology Integration:** Analyzing how both frameworks support the integration of technologies used in SPBE.
To evaluate the ability of each framework to integrate new and existing technologies. This is to ensure that the selected framework can support the organization's technological innovation and digital initiatives.
The criteria used are: Integration Capabilities, Compatibility, Support for Diverse Platforms, Interoperability, Data Integration, Technology Scalability and Technology Security.
4. **Regulatory Compliance and Governance:** Assessing the extent to which both frameworks meet the regulatory and governance requirements set by the government.
To evaluate the ability of each framework to integrate new and existing technologies. This is to ensure that the selected framework can support the organization's technological innovation and digital initiatives.
The criteria used are: Compliance with local regulations, IT Governance, Risk Management, Compliance with international standards, Documentation and Reporting, Audit and Compliance, Information Security Policy, IT Asset

Management, Transparency and Accountability, and Continuous Improvement.

5. Practical Implementation and Application: Reviewing cases of the application of both frameworks in government institutions.

To review how the frameworks are applied in practice and how effective they are in supporting the day-to-day operations of the organization. This objective is important to understand the practical application and added value provided by each framework.

The criteria used are: Scalability, Ease of Implementation, Implementation Cost, Implementation Time, Resource Availability, Support and Community, Adaptability to Existing Systems, Documentation and Guidance, Maintenance and Updates, and Cross-Department Integration.

6. Performance and Efficiency: Evaluating the implementation results in terms of performance and operational efficiency.

To measure the impact of each framework on organizational performance and efficiency. This is to ensure that the framework is not just theoretical, but also provides real benefits in terms of improved performance and operational efficiency.

The criteria used are: Speed of Implementation, Effectiveness of Resource Use, Ability to Manage Complexity, Consistency and Standardization, Monitoring and Evaluation, Support for Change, Operational Performance, Risk Management, Cost Efficiency, and Reliability and Security.

7. Case Studies and Empirical Evidence: Collecting and analyzing case studies from various institutions that have implemented TOGAF ADM and SPBE Architecture.

Collect and analyze real-world evidence from the application of each framework in a variety of contexts. This helps in understanding the successes and challenges faced in implementation, and provides insights that can be applied in other contexts.

Evaluation

The evaluation is conducted by comparing the implementation results of both frameworks based on performance, efficiency, regulatory compliance, and the level of technology integration.

RESULT AND DISCUSSION

Implementation Results

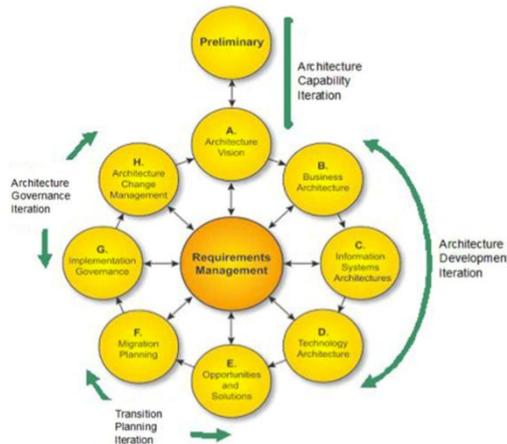
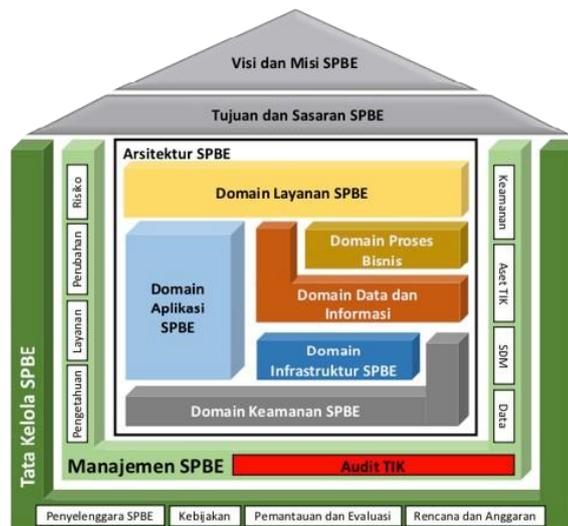


Figure. 2. TOGAF ADM Lifecycle

The implementation results show that TOGAF ADM (Desfray & Raymond, 2014) has advantages in clearer structure and composition, as well as flexibility in



adapting to changes. However, the SPBE Architecture excels in regulatory compliance and governance specific to the Indonesian government (Pemerintah Republik Indonesia, 2022).

Figure. 3. SPBE Framework

Evaluation Results

- Structure and Composition: TOGAF ADM is more structured with clear phases, while the SPBE Architecture has a specific focus on government applications.

- Flexibility and Adaptability: TOGAF ADM is more flexible in adapting to new technologies, while the SPBE Architecture is more specific but less flexible.
- Technology Integration: Both frameworks support technology integration, but TOGAF ADM has a more holistic approach.
- Regulatory Compliance and Governance: The SPBE Architecture is superior because it is designed in accordance with Indonesian government regulations.
- Practical Implementation and Application: Implementation cases show that a combination of both frameworks can yield better performance.
- Performance and Efficiency: The combination of both frameworks shows increased performance and operational efficiency.

Table 1. Evaluation Table

No	Category	TOGAF ADM	SPBE Architecture	Combination
1	Structure and Composition	High	Moderate	High
2	Flexibility and Adaptability	High	Moderate	High
3	Technology Integration	High	Moderate	High
4	Regulatory Compliance	Moderate	High	High
5	Practical Implementation	Moderate	Moderate	High
6	Performance and Efficiency	Moderate	Moderate	High

Table Explanation:

- High: Indicates strong performance or presence in a particular category.
- Medium: Indicates average performance or presence in a particular category.
- Low: Indicates weak performance or presence in a particular category.
- Long: Represents a long time required for implementation or achieving results.
- Moderate: Represents a moderate time required for implementation or achieving results.

CONCLUSION

The conclusion of this study indicates that TOGAF ADM and SPBE Architecture have their respective strengths and weaknesses in supporting SPBE implementation in government institutions. Combining both frameworks can result in better performance, particularly in terms of structure, flexibility, technology integration, and regulatory compliance. More effective implementation of both frameworks is expected to improve the efficiency and quality of government services.

This study concludes that the selection of an Enterprise Architecture (EA) framework should be based on the specific needs of government organizations and the strategic objectives to be achieved. Both the TOGAF ADM framework and the SPBE Architecture offer different but complementary approaches in the context of modernizing government systems. A better understanding of the characteristics and practical implementation of each framework will help government organizations choose and implement Enterprise Architecture (EA) more effectively and efficiently.

In the year before the issuance of Presidential Regulation No. 132 of 2022, other Enterprise Architecture Frameworks were still used, so the implementation and standardization of SPBE may not have been fully structured as stipulated in the regulation. This indicates an evolution in the approach and framework tools used in the development of the Electronic-Based Government System in Indonesia, especially related to the use of Enterprise Architecture before and after the regulation was enacted.

There are no regulations that regulate the steps of the transition plan and architecture governance as contained in the TOGAF ADM cycle in phase E to phase H.

REFERENCES

- Angelina, Tiofenny Fajrillah, A. A. N., & Hanafi, R. (2022). Penyusunan Enterprise Arsitektur SPBE Pada Badan Perencanaan Pembangunan Daerah Dalam Program Perencanaan Pengembangan dan Evaluasi Pembangunan Daerah Provinsi Jawa Barat. *Jurnal Ilmiah Teknologi Informasi Asia*.
- Desfray, P., & Raymond, G. (2014). *Modeling enterprise architecture with TOGAF: A practical guide using UML and BPMN*. Morgan Kaufmann.
- Fathoni, Maulana Muhammad Falahah, F., & Izzati, B. M. (2020). Perancangan Enterprise Architecture Sistem Pemerintahan Berbasis Elektronik Pada Bidang Pertanahan Menggunakan Togaf Adm (studi Kasus: Dinas Perumahan Dan Permukiman Provinsi Jawa Barat). *E-Proceeding of Engineering*.
- Kuru, Gede Sudanta Nethan Gumilang, S. F. S., & Nugraha, R. A. (2021). MODEL ARSITEKTUR SISTEM PEMERINTAHAN BERBASIS ELEKTRONIK (SPBE) DOMAIN PROSES BISNIS PADA PEMERINTAH KABUPATEN KUNINGAN. *JUPI (Jurnal Ilmiah Penelitian Dan Pembelajaran Informatika)*.
- Niniekasari, Z., & Firmansyah, G. (2023). Efektifitas Arsitektur Sistem Pemerintahan Berbasis Elektronik (SPBE) Domain Proses Bisnis Pada Pemerintah Kabupaten Cirebon. *Konferensi Nasional Ilmu Komputer (KONIK)*.
- Pemerintah Republik Indonesia. (2022). *Peraturan Presiden Nomor 132 Tahun*

2022 tentang Arsitektur SPBE Nasional.

- Pratama, M. A. B., Gumilang, S. F. S., & Mulyana, R. (2021). Arsitektur Enterprise Sistem Pemerintahan Berbasis Elektronik (spbe) Pada Domain Data Arsitektur Di Lingkungan Pemerintah Daerah Kabupaten Sukabumi. *EProceedings of Engineering*, 8(5).
- Putri, Vina Dwiana Gumilang, S. F. S., & Nugraha, R. A. (2021). Arsitektur Sistem Pemerintahan Berbasis Elektronik (SPBE) Pada Domain Aplikasi di Lingkungan Daerah Kabupaten Kuningan. *JUPI (Jurnal Ilmiah Penelitian Dan Pembelajaran Informatika)*.
- Saharah, Nesya Viola Falahah, F., & Maulidya, B. (2020). Analisis dan Perancangan Enterprise Architecture Sistem Pemerintahan Berbasis Elektronik Pada Bidang Infrastruktur Pemukiman Menggunakan TOGAF ADM (Studi Kasus: Dinas Perumahan dan Pemukiman Provinsi Jawa Barat). *E-Proceeding of Engineering*.
- Suhendry, M. R., & Firmansyah, G. (2023). Comparative Analysis: Review Keselarasan Architecture SPBE Kabupaten Cirebon Dengan Perpres No. 132 Tahun 2022 pada Domain Aplikasi. *Konferensi Nasional Ilmu Komputer (KONIK)*.
- Wibowo, Y., & Firmansyah, G. (2023). Analisis Perbandingan: Tinjauan Kecocokan Arsitektur SPBE Kabupaten Cirebon dengan Perpres No. 132 Tahun 2022 dalam Bidang Pelayanan. *Konferensi Nasional Ilmu Komputer (KONIK)*.
- Yustisiawandana, F. T., & Aji, R. F. (2024). Perancangan Enterprise Architecture untuk Meningkatkan Indeks SPBE Pemerintah Daerah: Studi Kasus Kabupaten Tasikmalaya. *Jurnal Teknologi Dan Sistem Informasi Bisnis (JTEKSIS)*.