

ENTERPRISE ARCHITECTURE FOR DIGITAL TRANSFORMATION (EADT): AN INITIAL CONCEPTUAL FRAMEWORK FOR ACCELERATING DIGITAL TRANSFORMATION IN PRIVATE HIGHER EDUCATION INSTITUTIONS IN INDONESIA

YUDISTIRA SOEGOTO^{1,2,*}, HARJANTO PRABOWO¹,
HARYONO SOEPARNO¹,
HARCO LESLIE HENDRIC SPITS WARNARS¹,
YULDUZ KHAIRULLA KIZI KHUDOYBERDIEVA³

¹Computer Science Departement, Doctor of Computer Science,
Bina Nusantara University, Jakarta, Indonesia

²Management Departement, BINUS Business School Undergraduate Program,
Bina Nusantara University, Jakarta, Indonesia

²Department of Information System, Universitas Komputer Indonesia, Bandung, Indonesia

³Faculty of Exact Sciences, Chirchik State Pedagogical University, Uzbekistan

*Corresponding Author: yudistira.soegoto@binus.ac.id

Abstract

This study tries to develop an EADT model that can act as a bridge between the actual needs of Private Universities and the existing enterprise architecture framework. Because the research methodology being used applied the approach of DSRM with only three stages of problem identification, goal setting, and model design. The findings from the research provide evidence on how the main inhibiting factors for digital transformation in PTS are limited human resources, suboptimal digital infrastructure, organizational resistance, and weak integration of data and business processes. The model that had been proposed here for EADT gives an initial concept on which technology, governance, business process, and organizational culture components should integrate and support the acceleration of digital transformation in Public Transportation Service organizations. The expected results from this study will definitely be of theoretical contribution to enterprise architecture in general through its further development and practically contribute to leading members of Private Universities with the formulation of sustainable strategies on digital transformation in the future.

Keywords: Conceptual model, Design science research, Digital transformation, Enterprise architecture, Higher education.

1. Introduction

The impact of digital technology changes on higher education institutions represents a paradigm shift. Private Universities (PTS) within Indonesia are compelled to adapt at an accelerated rate so as to be able to compete at an international level. The impact on global digital disruption affects various sectors: industry, economy, and learning institutions. As an integral participant within Indonesian higher education, Private Universities (PTS) have struggled with aligning organizational strategy with digital transformation best practices [1]. Classic enterprise architecture models like TOGAF and Zachman have been employed for some time as tools for aligning business and information Technology strategy and implementation [2-5]. Nevertheless, these have not incorporated adaptability for addressing dynamic and disrupting forces within the digital paradigm [6].

Consequently, it sometimes becomes difficult for these institutions to undergo sustainable digital transformation due to fragmented approaches and a lack of consideration for human resource factors [7]. Digital transformation becomes an imperative for efficiency reasons, for the purpose of good academic service delivery, and for good relevance of graduates in the labour market. Despite the fact that processes related to digital transformations have been hindered on several occasions by various factors, starting from a human resources deficit and ending with institutional governance, thus and thus, a burning need emerges for the application of an enterprise architecture model that would exclusively and effectively accelerate digital transformations in Private Universities (PTS).

Enterprise architecture for digital transformation (EADT) would serve as the good conceptual foundation intended to merge strategy and processes together with technologies and institutional governance for the purpose of digital transformations. To fill this gap, this study proposes the concept of the enterprise architecture for digital transformation (EADT) as the initial approach and framework of integration of strategy, business, technology, and human resources. This paper utilizes the design science research (DSR) approach to construct a model of the final result and will be thoroughly studied based on the needs and problems of private universities within the Indonesian context. The originality of this paper surrounds the integration of several additional parts, including the concept of People and Strategy, within the framework of the enterprise architecture for digital transformation (EADT). The EADT model will expedite the digital transformation of Indonesian Private Universities (PTS) towards realizing the hope of *Indonesian Emas 2045*.

2. Methodology

This research uses formulate the design science research methodology (DSRM) approach [8, 9]. In general, design science research methodology (DSRM) consists of six stages, namely problem identification, goal setting, design and development, demonstration, evaluation, and communication [10, 11]. Even though DSRM has six stages, this research will focus on problem identification, goal definition, and design and development of the conceptual research model shown in Fig. 1 research methods.

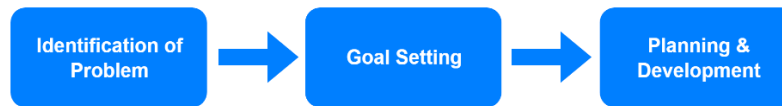


Fig. 1. Research methods.

3. Results and Discussion

3.1. Conceptual enterprise architecture

Bernard defines enterprise architecture (EA) as a harmonization process among strategy, business, and technology. Though this paradigm is useful to align technology investments from a value perspective, it does not handle organizational culture change or human resources capacity effectively. Figure 2 depicts the conceptual model of enterprise architecture. In this model, the base of strategy outlining the organizational vision, organizational mission, and organizational directions as a form of organizational policies is implemented by businesses through various business processes enabled by technology.

$$EA = S + B + T$$

Enterprise Architecture = Strategy + Business + Technology

Fig. 2. The conceptual enterprise architecture.

Strategy also defines the guidelines for the organization to achieve its goals and how to direct changes in technology and business processes. The Business component describes the organizational structure, business processes, services, roles, and operational activities that serve as a link between strategy and technology implementation [12]. Technology acts as the enabler through the application of infrastructure, application, as well as the use of digital platforms, aligning these to the organizational needs as opposed to being the end results themselves [13]. Enterprise architecture is efficient when strategy, business, and technology are aligned.

3.2. Conceptual digital transformation

The framework on digital transformation (DT) from Bonnet, Didier, and Westerman also emphasizes that DT is an end-to-end process in an organization, not just an information technology project, anchored on the convergence of three pillars: people, business, and technology. Yet the framework fails to address the issue of change sequencing process, decision-making, and governance. As depicted in Fig. 3, the integration of the three pillars likely people, business, and technology, is also the process of digital transformation, especially involving the governance and strategic alignment in the transformation process of the private universities in Indonesia.

$$DT = P + B + T$$

$$\text{Digital Transformation} = \text{PEOPLE} + \text{BUSINESS} + \text{TECHNOLOGY}$$

Fig. 3. The concept of digital transformation.

Literature suggests that the adoption of technology in digitization is, in fact, a function of the human resource, business, or organizational strategy. This is because the process of digitization is socio-technical, which is represented by the synergy between technology, business, or organizational structures, and strategy [14]. Human resources are an indispensable part of digitization, which is represented by technology, culture, or adaptability, and business, which focuses on the various processes as well as services designed to ensure strategic outcomes or performances [15, 16]. Technology acts as an enabling force that focuses on data, automation, or innovation, which remains effective in harmony with human readiness or business requirements [17].

3.3. Evolution of the conceptual model of EA and DT towards EADT

The conceptual evolution presented in Fig. 4 offers a powerful framework to bridge the theoretical and practical gap between enterprise architecture (EA) and digital transformation (DT). The emphasis of EA is on structural alignment between strategy and technology, while DT emphasizes changes in operations through and with people with technology. Combining these perspectives yields Enterprise Architecture for Digital Transformation, EADT, conceptualized as $S + B + T + P$, representing deep alignment rather than a sum of the parts. EADT robust DT with the explicit inclusion of the Strategy, S, domain, helping to overcome the ad hoc nature of many transformation initiatives, and extends EA with explicit inclusion of the People, P, domain to highlight themes of adoption, competency and organizational culture. Together, the four pillars of strategy, business, people, and technology are a holistic framework for effective digital transformation, as summarized in Fig. 5.

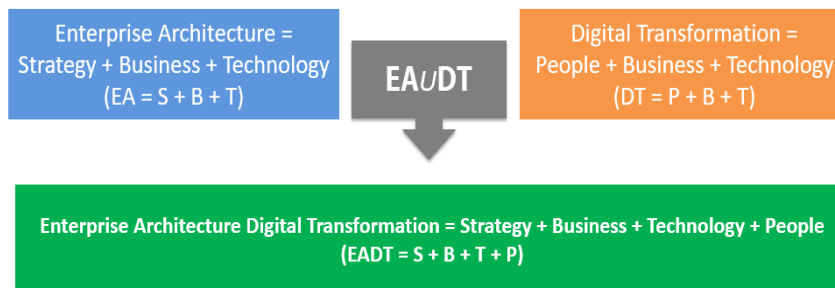


Fig. 4. Conceptual evolution of EA and DT towards EADT.

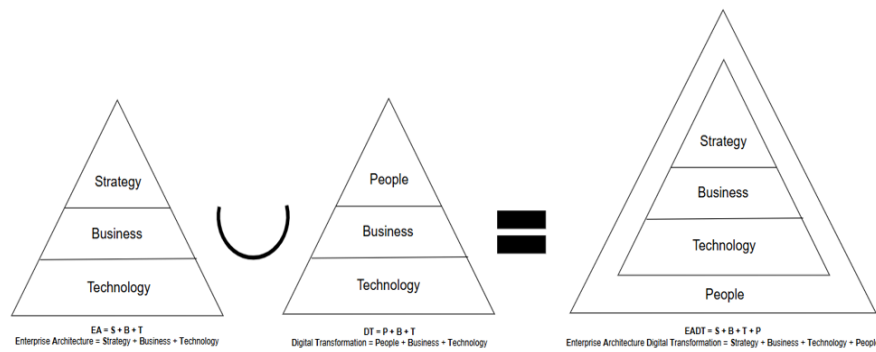


Fig. 5. Early model of EADT.

Every domain is represented using a pyramid model that signifies the component dependencies in the context of Private Universities in Indonesia. The integration ($\cup$) of enterprise architecture (EA) and digital transformation (DT) creates a holistic model that is known as enterprise architecture for digital transformation (EADT). The pyramid model represents that strategy is the key driving force at the top, achieved by business processes, facilitated by technology, and most importantly, supported by people, who provide a base for it. The model signifies that technology is an enabler, where adoption, human competencies, and organizational influence will ensure that a model remains stable. It is described as $EADT = S + B + T + P$, which covers the shortcomings in current models, along with joining the requirements of both traditional EA model and current DT Models, applied in Private Universities (PTS) in Indonesia.

Contrary to the conventional enterprise architecture (EA) models, enterprise architecture for digital transformation (EADT) covers the technological aspects in a more encompassing way by incorporating the People (P) elements, such as the social aspects, organizational culture, and business values, which are often left out in models like TOGAF and pose as a challenge during the implementation of digital transformation. This moves fall in line with the current research on digital transformation, suggesting the necessity of mapping the technological aspects along with the organizational aspects during the process of digital transformation [15]. EADT further enhances the Digital Transformation models by giving prominence to Strategy (S) at the beginning of the framework, indicating the shortcoming in the area of strategy and governance and emphasizing the necessity of having a strategic vision and mission during the process of digital transformation. This has been emphasized in Vial's study of digital transformation, suggesting the sociotechnical nature and strategic fit during the process of digital transformation [14, 16]. The integration between strategy, business, technology, and people (S+B+T+P) enables the EADT framework in offering a more holistic outlook towards the implementation of organized and rapid digital transformation in the domain of Private Higher Education.

The results suggest that the addition of the People (P) dimension to the enterprise architecture for digital transformation (EADT) framework complies with existing research, which argues that conventional models of enterprise architecture lack relevance, having technical elements centred on structure with little regard to people and cultural dimensions, resulting in resistance within organizations [18,

19]. Within the context of private Indonesian universities, the success and adaptability of digital transformation efforts rely greatly on the readiness of the organizational human resources and organizational cultures. The Strategy (S) component should be positioned first in the model, indicating that having direction and proper governance strategies in place constitute an important oversight within digital transformation efforts to avoid scattered initiatives that hinder successful transformation [14, 16, 20].

In this study, the barriers have also been determined and include limited digital skills, weak integration of data, and limited cultural integration, among others, and this corroborates the findings of the global educational digitalization challenges [7]. Organizational culture was reported to play a major role and impact the success of digital transformation initiatives [19-23], thus placing People (P) not only within the EADT model but as the cornerstones of the model. Technological value is achievable only when technology and relevant business strategies and processes are well aligned [17, 24, 25].

4. Conclusion

This research will be conducted to further refine the Enterprise Architecture for Digital Transformation model by providing an adaptive approach for Private Universities that are confronted with, or alternatively need to be adapted to, digital change. From the results, it can be seen that mainstream EA frameworks are still inadequate due to the limited concern for people, organizational culture, and strategy. The EADT model fills this gap because it focuses on balancing Strategy, Business, Technology, and People and is adaptive. Key factors influencing the success of digital transformation include readiness of people, integration of data and processes, and alignment of strategy. Private Universities may get closer to strategic alignment by adopting EADT, thus enhancing their digital implementation and, finally, planning changes. Future studies should preferably target empirical validation to study the relationships among the components in more depth.

References

1. Musahid, F.N.; Fawzi, F.S.; Maghfuriyah, A.; Hertin, R.D.; Wijaya, H.; Anjara, F.; and Istiqomah, N.A. (2024). Digital transformation: A strategic imperative for modern enterprises. *Journal of Economics, Assets, and Evaluation*, 2(1), 1-7.
2. Sowa, J.F.; and Zachman, J.A. (1992). Extending and formalizing the framework for information systems architecture. *IBM Systems Journal*, 31(3), 590-616.
3. Indrawan, B. (2019). Perancangan enterprise architecture universitas berdasarkan tri dharma perguruan tinggi menggunakan zachman framework (studi kasus: Universitas komputer indonesia). *Jurnal Tata Kelola Dan Kerangka Kerja Teknologi Informasi*, 5(2), 43-49.
4. Hakim, M.L.; and Putra, Y.H. (2024). Perancangan enterprise architecture planning sebagai blue print sistem informasi pada badan keuangan daerah kota Singkawang. *Jurnal Tata Kelola dan Kerangka Kerja Teknologi Informasi*, 10(2), 70-80.

5. Prapenan, G.G.; and Sumitra, I.D. (2023). Perancangan enterprise architecture sistem manajemen heksa proses produksi menggunakan TOGAF ADM. *Jurnal Tata Kelola dan Kerangka Kerja Teknologi Informasi*, 9(1), 42-54.
6. Alghamdi, H. (2025). Integrating emerging technologies into enterprise architecture: Challenges and opportunities. *Access Journal*, 6(1), 8-24.
7. Hashim, M.A.M.; Tlemsani, I.; and Matthews, R.D. (2022). A sustainable university: Digital transformation and beyond. *Education and Information Technologies*, 27(7), 8961-8996.
8. Hevner, A.R.; March, S.T.; Park, J.; and Ram, S. (2004). Design science in information systems research. *MIS Quarterly*, 28(1), 75–106.
9. Schoormann, T.; Möller, F.; Kruse, L.C.; and Otto, B. (2024). BAUSTEIN—A design tool for configuring and representing design research. *Information Systems Journal*, 34(6), 1871-1901.
10. Kurniawan, B.; Meyliana, M.; Warnars, H.L.H.S.; and Suharjo, B. (2024). Development of intelligent tutoring system model in the learning system of the Indonesian national armed forces completed with bibliometric analysis. *ASEAN Journal of Science and Engineering*, 4(2), 207-220.
11. Kurniawan, B.; Meyliana, M.; Warnars, H.L.H.S.; and Suharjo, B. (2023). Designing a learning system based on intelligent tutoring system using design science research. *Journal of Engineering Science and Technology*, 18(3), 1438-1446.
12. Batmetan, J.R.; Rawis, J.A.; Lengkong, J.S.J.; and Rotty, V.N.J. (2023). Future trends for direction in enterprise architecture: Systematic literature review. *International Journal of Information Technology and Education*, 2(3), 1-20.
13. Kemalasari, A.A.; and Sutrisno, S. (2024). Optimizing enterprise architecture: The role of TOGAF in driving organizational transformation. *Indonesian Journal of Enterprise Architecture*, 2(1), 23–30.
14. Elia, G.; Solazzo, G.; Lerro, A.; Pigni, F.; and Tucci, C.L. (2024). The digital transformation canvas: A conceptual framework for leading the digital transformation process. *Business Horizons*, 67(4), 381-398.
15. Kraus, S.; Jones, P.; Kailer, N.; Weinmann, A.; Chaparro-Banegas, N.; and Roig-Tierno, N. (2021). Digital transformation: An overview of the current state of the art of research. *Sage Open*, 11(3), 1-15.
16. Verhoef, P.C.; Broekhuizen, T.; Bart, Y.; Bhattacharya, A.; Dong, J.Q.; Fabian, N.; and Haenlein, M. (2021). Digital transformation: A multidisciplinary reflection and research agenda. *Journal of business research*, 122, 889-901.
17. Hanelt, A.; Bohnsack, R.; Marz, D.; and Marante, C.A. (2021). A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of Management Studies*, 58(5), 1159-1197.
18. Zhou, Z.; Zhi, Q.; Morisaki, S.; and Yamamoto, S. (2020). A systematic literature review on enterprise architecture visualization methodologies. *IEEE Access*, 8, 96404-96427.
19. Baojing, Z.; Alias, N.; and Yaacob, M.H. (2025). The relationship between organizational culture and digital transformation in SMEs: A systematic review. *Multidisciplinary Reviews*, 8(5), 2025162-2025162.

20. Korachi, Z.; and Bounabat, B. (2020). General approach for formulating a digital transformation strategy. *Journal of Computer Science*, 16(4), 493-507.
21. HosseiniNasab, S.M. (2025). A maturity-driven selection model for effective digital transformation governance mechanisms in large organizations. *Kybernetes*, 54(9), 5106-5132.
22. Brunetti, F.; Matt, D.T.; Bonfanti, A.; De-Longhi, A.; Pedrini, G.; and Orzes, G. (2020). Digital transformation challenges: strategies emerging from a multi-stakeholder approach. *The TQM Journal*, 32(4), 697-724.
23. Singh, A.; Klarner, P.; and Hess, T. (2020). How do chief digital officers pursue digital transformation activities? The role of organization design parameters. *Long Range Planning*, 53(3), 101890.
24. Ahmad, T.; Aakula, A.; Ottori, M.; and Saini, V. (2022). Developing a strategic roadmap for digital transformation. *Journal of Computational Intelligence and Robotics*, 2(2), 28-68.
25. Otia, J.E.; and Bracci, E. (2022). Digital transformation and the public sector auditing: The SAI's perspective. *Financial Accountability and Management*, 38(2), 252-280.