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Enterprise Architecture Application for Strategy and Innovation: A Literature Review

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Abstrak

Pengembangan informasi pada saat ini menjadi kebutuhan yang pentig di berbagai bidang. Keselarasan antara teknologi informasi dan sistem informasi mendukung perusahaan dalam mengembangkan strategi bisnis. *Enterprise Architecture* adalah arsitektur untuk merancang sistem informasi dan teknologi informasi dalam suatu perusahaan atau organisasi. Penerapan *enterprise architecture* dalam suatu industri perusahaan digunakan untuk strategi bisnis, inovasi pengembangan dan tata kelola perusahaan. Dengan adanya arsitektur yang terstruktur dalam suatu perusahaan mengarahkan pemodelan kegiatan bisnis untuk mengoperasikan bisnis, mengintegrasikan berbagai sistem bisnis, mengelola teknologi informasi secara lebih efisien. Makalah ini bertujuan untuk memberikan tinjauan literatur tentang penerapan *enterprise architecture* dalam suatu perusahaan atau organisasi. Makalah ini membahas tentang penelitian sebelumnya dengan mengkategorikan berdasarkan tujuan dari penelitian, model *enterprise architecture* yang digunakan, dan kategori area penerapan. Hasil dari penelitian ini yaitu untuk menyediakan tinjauan literatur yang dapat digunakan dalam membantu suatu perusahaan dalam menerapkan *enterprise architecture* yang sesuai dengan strategi dan inovasi perusahaan untuk mencapai visi, misi dan tujuan. Selain itu dapat digunakan dalam menemukan topik penelitian baru tentang prospek masa depan dalam penerapan *enterprise architecture* guna pengembangan dan pegolahan sistem informasi maupun teknologi informasi di perusahaan atau organisasi.

Kata Kunci: Tinjauan Literatur, *Enterprise Architecture*, Strategi Bisnis, Perusahaan.

Abstract

Information development at this time is an important need in various fields. Alignment between information technology and information systems supports companies in developing business strategies. Enterprise Archive is an architecture for designing information systems and information technology in a Corporate or organization. Application. Enterprise Architecture in a company industry is used for business strategy, development innovation and corporate governance. With a structured architecture in a Corporate directing business activity modeling to operate a business, integrating various business systems, managing information technology more efficiently. This paper aims to provide a literature review on the application of Enterprise Architecture in a company or organization. This paper discusses the previous research by categorizing it based on the objectives of the study, the Enterprise Archive model used, the application area category. The results of this study are to provide a review of the literature that can be used to assist a Corporate in implementing Enterprise Architecture in accordance with the company's strategy and innovation to achieve its vision, mission and goals. Besides that, it can be used in finding new research topics about future prospects in implementing Enterprise Architecture for the development and processing of information systems and information technology in a corporate or organization.

Keywords: Literature Review, Enterprise Architecture, Business Strategy, Corporate.

1. Introduction

The era of globalization provides fast and accurate information for the needs of an organization or company industry. One of the factors that support the presentation of this information is Information Technology and Information Systems in increasing the needs and functions of existing services in various industrial fields. A company or organization mutually innovates strategies to implement appropriate information systems and information technology, so the company would gain competitive advantages over competitors.

Companies need harmony between information systems and information technology in building an Enterprise Architecture for company development. Enterprise Architecture is an architecture for designing information systems and information technology in a company or organization. The architecture used in modeling business processes and information characteristics to be in accordance with business strategies and business innovation. The existence of an Enterprise Architecture in the company can increase the efficiency of information technology operating costs and can reduce the risk of investing in information technology in the future [1]. Several companies have used Enterprise Architecture in business management and strategy to achieve the goals of these companies. One of them, the concept of a virtual company is an innovative business strategy that acts effectively in the IT field [2]. In addition, the existence of a business architecture in a company can integrate business strategy models, business operations, information technology governance and human resources to support the business activities of a company. The impact of architecture is categorized from each business architecture model, with impacts characterized as strategic benefits, IT infrastructure benefits, and operating benefits. One of the factors that influence the architecture in the company is leadership, because it has the right to make the basis for policies and rules that are used to achieve the goals set through governance [3].

The main purpose of this study is to provide a literature review on the application of enterprise architecture in a company that focuses on discussing previous research using a systematic literature review method. Identification and categorization based on research objectives, the Enterprise Architecture used, and the category of application areas.

2. Related Works

Industry companies or organizations compete in implementing business strategies and providing fast and accurate information in achieving the goals of a company or organization. Companies or organizations will use Enterprise Architecture to design, develop, integrate, and process information systems and information technology to become more structured and efficient. Enterprise Architecture that is implemented must be in accordance with the vision, mission, strategy, and tactics to reach the goals and achieve the targeted results of the company. The business architecture is used in business process modeling, business innovation and information characteristics. Modeling of Enterprise architecture frameworks such as Zachman framework, COBIT, TOGAF, SOA, SAM, and others. Architectural modeling can be applied in a company or organization according to their individual needs.

There are previous studies that have discussed Enterprise Architecture used in education [4], business [5], organizational governance [6], health [7], education [8] and others. Based on Anjee Gorkhali's research on literature review on Enterprise Architecture, the paper provides a detailed overview of available research in the Enterprise Architecture field and groups them into 27 categories. Each category is summarized and can be used as a reference or research direction for each category described in subsequent research in that topic [9].

Based on Prince Kwame Senyo et.al's review of the research literature [10], reviewed several research studies on digital business ecosystems (DBE). The method used in the literature review is a five-stage systematic review process. There are 5 stages as shown in Figure 1.

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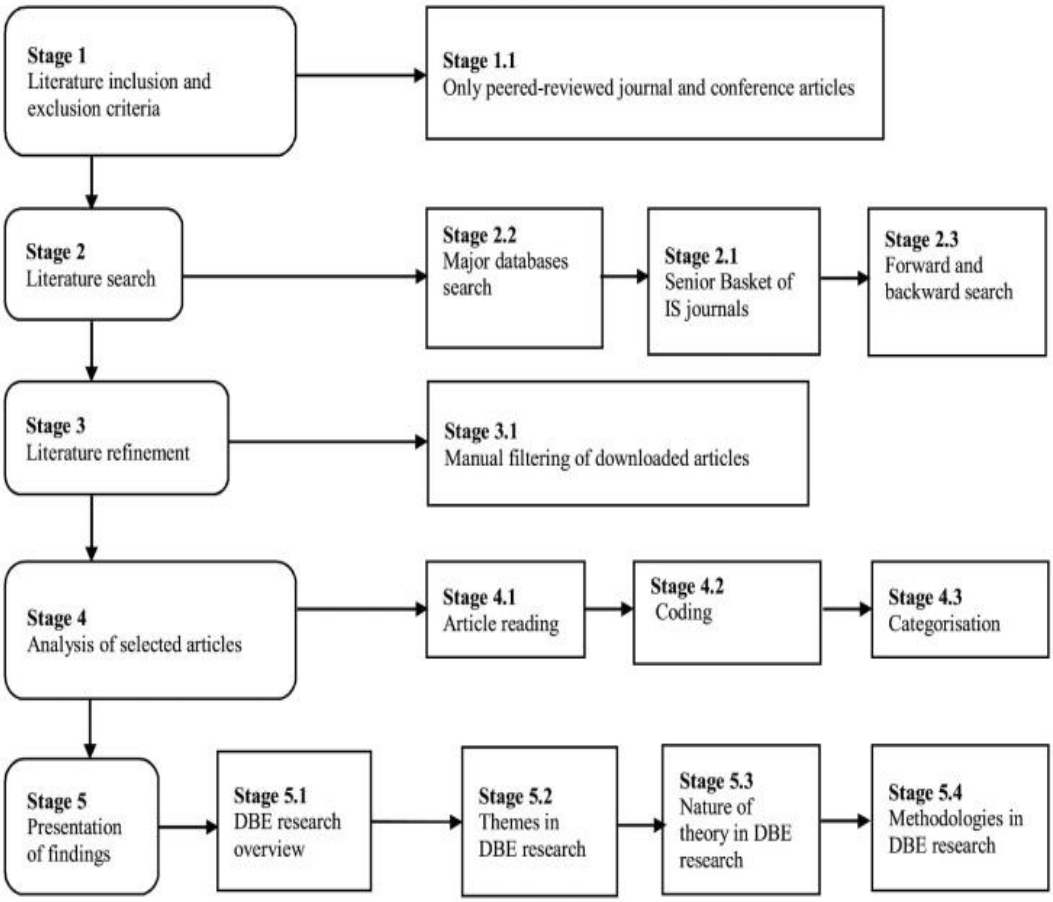

Figure 1. the five-stage systematic method in the literature review process [10]

Figure 1 explains the stages of the method used in the literature review process, there are 5 stages, namely the first stage of literature definition, inclusion and exclusion criteria, the second stage of literature search, the third stage of literature refinement, the fourth stage of analyzing the selected articles and the last stage of presenting findings.

This research is a literature review of published research studies on the application of Enterprise Architecture to corporate strategy and innovation. The originality of this research lies in the systematic literature review process which has 3 stages, namely search, elimination and category identification. Search for journals or previous research that has been published in international journals, international conferences or accredited national journals. The elimination process is carried out to select journals that are in accordance with the scope and year of publication between 2018-2023. And then identify categories based on research objectives, the Enterprise Architecture model used, and application area categories.

3. Methodology

The methodology used is a systematic literature review to review previous research regarding the application of Enterprise Architecture which determines corporate strategy and innovation. There are 3 stages in the literature review process namely search, elimination and category identification. The flow diagram in the research methodology is shown in Figure 2.

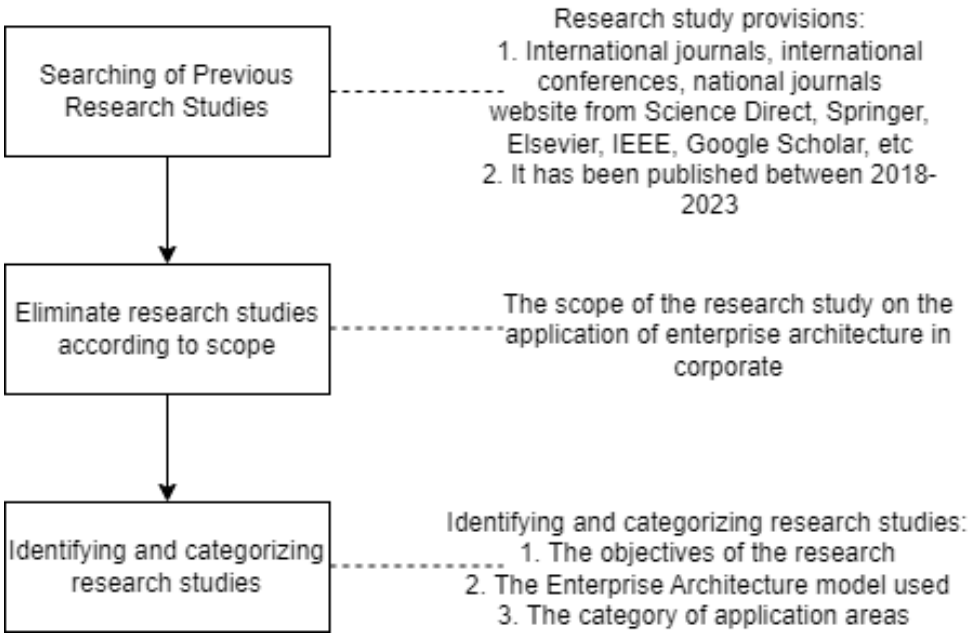

Figure 2. Flow diagrams of the methodology stage

Figure 2 represents the stages of the research methodology. Stage 1 is looking for research studies that have been published in international journals or international conferences and national journals between 2018 and 2023. The website used is Elsevier, Springer, Google Scholar, Science Direct, Research Gate, IEEE, Sinta DIKTI, etc. Stage 2 is to eliminate and select previous research studies on the application of Enterprise Architecture in companies. Stage 3 is identifying and categorizing research studies based on the objectives of the research, the Enterprise Architecture model used, and the category of application areas within the company according to the research study.

4. Results and Discussion

At this stage, discuss the results of the literature review. After searching for and eliminating research studies, there were previous research studies published in international journals and international conferences and national journals from 2018-2023. The results of the research studies were selected based on the application of Enterprise Architecture in the company. Next, identify the categories of research studies based on the objectives of the study, the enterprise architecture model used, and the category of application areas. First identification is categorizing research studies based on the objectives of the research as in Table 1.

Table 1. Categories based on research objectives.

Research Category Based on Objectives	References
Enhancing and supporting strategic, innovation between business and IT.	[11][12][13][14][15][16][17][18]
Planning and developing information systems.	[19][20][21][22][23]
IS / IT governance, validation, and evaluation	[24][4][25][26]
Implementation of Enterprise Architecture (EA) in the company / organization	[27][28]
Designing innovative service systems in smart tourism	[29][30][31]
Analyze and integrate into business processes	[32]

Research Category Based on Objectives	References
Enterprise Architecture (EA) is used as a system management concept	[7] [33]
The Concepts of Digital Infrastructure	[34]

Table 1 is the result of categorizing research studies based on the objectives of the research. The first rank is that the existence of Enterprise Architecture can be used to improve and support the strategy between business and IT. With the Enterprise Architecture, a company can determine the business direction and business model in accordance with the vision, mission, and goals of the company. The second rank is planning and developing information systems., in a company that has not implemented Enterprise Architecture, it is very suitable for designing and developing information systems that can be used to be more structured, efficient, and effective. In addition, the existence of Enterprise Architecture in the company can be used for governance, auditing, validation, and evaluation of Information System / IT.

The application of Enterprise Architecture must be adapted to technology, infrastructure, human resources, and future investment. Technology is used in processing information systems to be faster and more accurate. Infrastructure is used for infrastructure and liaison within a company. Meanwhile, human resources act as the influential main actors in Enterprise Architecture, because they are required to be intelligent human resources who are responsive to change and willing to learn in company development. With the implementation of Enterprise Architecture in the company, it can be used as a future investment in the company.

After categorizing based on the objectives of the research, then categorizing the research study based on the Enterprise Architecture model applied in the research study as shown in Table 2.

Table 2. Category by Enterprise Architecture model

Research Category Enterprise Architecture Model	References
TOGAF	[7][19][35][11][4][30][36][37][16][18][38]
COBIT	[25][15][39][40][22][38]
Zachman framework	[20][27][21][12][13]
Service Oriented Architecture (SOA)	[34][41][42]
Structure-Behavior Coalescence architecture	[31][32]
EA3 Cube Framework	[23]
Enterprise architecture management (EAM)	[33]

Table 2 is the result of categorization based on the Enterprise Architecture model which is applied in the design, development, business strategy, and innovation of the company. The most widely used Enterprise Architecture models are TOGAF, COBIT, Zachman Framework, and SOA. In the application of the TOGAF framework for the application of *Health Minimum Services Standards (HMSS)* [19] information systems blueprint, there are 4 architectural categories, namely business architecture, data architecture, application architecture, and technology architecture. The planning stage of Enterprise Architecture refers to the TOGAF ADM stage which consists of five (5) phases of activities required in building an architectural information system, including: architectural vision, business architecture, information system architecture, technology architecture, and also opportunities and solutions.

In implementing the COBIT framework, it can be used to identify IT governance and process management to explain the achievement of strategies with business objectives. The domain in the management area consists of four domains, namely (1) aligning, planning, managing, building, (2) obtaining

and implementing, (3) providing, service and support, (4) monitoring, evaluating, and assessing. The application of the COBIT framework can address issues of governance and management of IT processes within the company to explain the achievement of harmony and security [25].

After categorizing based on the Enterprise Architecture model used in research studies, then categorizing research studies based on the area of application in the research study as shown in Table 3.

Table 3. Category by area of application.

Research Category By Area of Application	References
Tourism industry	[5][29][43][30][2]
Public Sector	[36][44][34]
Health	[7][19][23]
Automotive company	[22][45]
Organization	[27][20]
Logistics company	[15][38]
IT finance	[40][32]
Education	[18] [26]

Table 3 is the result of categorizing research studies based on their application areas. the most used area of application is the tourism industry. In the tourism industry area, Enterprise Architecture can be used as business innovation, tourism recommendations / predictions, and can be applied to smart tourism. The application of Enterprise Architecture in the tourism industry can be used as a business strategy in introducing and developing tourism spots. In addition, with the existence of Enterprise Architecture by innovating the concept of smart tourism, it can be used as an attraction for visitors to come to these tourism places.

5. Conclusion and Suggestion

Based on the results of a review of research studies on the topic of implementing Enterprise Architecture in companies, it is concluded that Enterprise Architecture can be used to improve and support strategic between business and IT, planning and developing information systems and governance innovation, validation, and evaluation of information system and IT in a company. The most commonly used Enterprise Architecture models are TOGAF, COBIT, Zachman Framework, and SOA. Areas of application can be in the tourism industry, public sector, health, logistics, automotive, organization, and others. The application of Enterprise Architecture is important for planning, understanding, managing strategy and innovation in a corporate or organization.

The results of this study are to provide a literature review that can be used in helping a company implement an Enterprise Architecture in accordance with the company's strategy and innovation. In addition, it can be used in finding new research topics about future prospects in the application of Enterprise Architecture in a company or organization. In further research, the literature review of the application of Enterprise Architecture in companies or organizations can be developed by categorizing based on the uses, advantages and disadvantages of each Enterprise Architecture model and its architectural design.

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