

## Alignment of Business Strategy and Information Technology in Special Economic Zone using Enterprise Architecture

Ahmad Ari Nugrahanto<sup>1</sup>, Viany Utami Tjhin<sup>2</sup>

<sup>1,2</sup>Information Systems Management, Universitas Bina Nusantara, Indonesia  
ahmad.nugrahanto@binus.ac.id, vjhin@binus.edu

### Abstract

*In recent years, companies engaged in co-working space have provided services to entrepreneurs, startups, freelancers, developers, businesses, and their teams through information technology, increasing their massification and access. These are generally provided based on the government's objective to meet industry 4.0 requirements. Still, the differences in digitization and the lack of standard e-service complicate the balance in their business. On the other hand, enterprise architecture can be used for standardization, convergence, and interoperability in e-business. Moreover, it allows a holistic perspective to view the information technology resources of co-working space businesses and align them with their business strategy. This research aims to list some gaps between existing business architecture with enterprise architecture in co-working businesses in Batam, Indonesia Special Economic Zone.*

### Keywords

enterprise architecture; the open group architecture framework; information technology; co-working business; local business



## I. Introduction

A co-working space is a shared office or building where entrepreneurs, startups, freelancers, developers, businesses, and their teams meet to work independently and socialize and collaborate on projects. A co-working space is not just a work office, but also builds a network and has fun.

In this context, the co-working space continues to be evaluated by the above stakeholders regarding the quality of the services they provide, especially related to the basic things needed, not only by the terms and conditions of the contract but also from Information Technology which is always up to date.

To support their management, co-working space businesses have incorporated Information and Communication Technology (ICT) in recent years, as a strategy that helps achieve their goals. The role of ICT is very helpful in providing services during the Covid-19 pandemic. The outbreak of this virus has an impact of a nation and Globally (Ningrum et al, 2020). The integration of ICT in the co-working space business means that there must be a big difference in providing services to stakeholders. This unequal integration of ICTs is multifactorial. Although the economic resources devoted to this task are a major factor, it is necessary to consider how these technologies are incorporated in the co-working space business processes. Incorporating ICT is not always an easy task for all co-working space businesses, as they do not always have clear guidelines or orientations on aligning their mission with the processes and technologies that support it.

As it becomes fundamental to have a global view of the issues to be addressed so that technology integration is planned and focused.

In this way, local businesses can relate the motivational aspect to the processes, services and technologies that support it. Moreover, within the framework of e-administration initiatives, it can be a path to follow to achieve standardization, convergence, and interoperability in local businesses.

Although the development of EA in the co-working space business is a topic that is rarely discussed, work that is oriented towards achieving standardization, convergence, and interoperability has been found.

Making an EA reference composed of a set of models and general construction principles for creating architecture will enable local businesses to address ICT integration issues. Moreover, these EA references are reusable with possible advantages for work efficiency, reducing errors, and speeding up solution development.

This method is generally defined and then initiated to present an EA reference which in this case includes additional services that the co-working business must provide in Batam, Indonesia Special Economic Zone for stakeholders in accordance with up-to-date Information Technology and can also be applied throughout the co-working business in Indonesia. This article is organized as follows. Section 2 defines the need for enterprise architecture. The method for the definition of a reference EA in section 3. In Section 4, the development of Reference and Result. Finally, Section 5 presents the conclusions and future research.

## II. Review of Literature

### 2.1 Coworking Business

The key characteristics of co-working spaces are stated as following. The purpose is to introduce and implement creative and boundaryless work, learning through collaborative environment. The types of space are different for every space environment; office equipment's such as rentable desks with open space, large meeting rooms, private offices, and coffee corners. The model of this space can be rented daily, weekly, or monthly and also provide the membership for the usage of meeting rooms (Sanny et al., 2019).

Spurred by technological, social, and economic forces, today's co-working spaces are born out of several generations of private and public sector-sponsored business stimulation efforts. As the latest evolution of more than 50 years of innovative workplace development, co-working spaces are the most influential type among all alternative workplaces, including incubators, accelerators, and innovation centers (Zhai, 2017).

**Table 1.** Types of Innovation Workspace

Workplace	Inception	Purpose
Incubator	1959	Rent empty space by stimulating commerce through grouping together small business. Later incarnations added business assistance and financing opportunities.
Innovation Center	1999	Provided office space and services to young companies, initially to tech startups. Focus on commercialization of innovation and entrepreneurship.
Accelerator	2005	Programming-based workplaces designed to help startup companies grow more rapidly by providing them with technical and educational assistance, mentoring, networking opportunities and workspaces.
Co-working Center	2006	A membership-based, interdisciplinary workplace for independent workers and startup companies, providing community, business services, collaboration opportunities and a place to focus on work as well as to participate in social and educational events.

(Rus & Orel, 2015) The active community in the co-working space is formed through the growth of strong bonds, based on trust built among members. This strong bond and mutual trust encouraged the process of information, ideas, and knowledge sharing. This bond was built because of continuous facilitated interaction and shared interest between members.

(Bouncken et al., 2016) The co-working space is one of the emerging business models that have gained much exposure in Asian countries, and the business itself has gained a lot of profits and advantages. The main focus of this business model is to build bonds with one another. Another factor that would predict whether the business model will prevail or not is the literal location of the co-working space. If it is close to the center of the city and supported by the right marketing tactics, there is a high possibility that the co-working space will be successful.

## 2.2 The Need for Enterprise Architecture

Enterprise Architecture (EA) refers to the definition and representation of a high-level view of an enterprise's business processes and IT systems, their relationships, and the level of standardization and integration, concerning these elements, throughout the enterprise. EA underpins decisions relating to data, applications, IT infrastructure (technical and human), and management responsibilities. It also informs and enhances strategies (business, operations, and IT) that enable organizations to accomplish their objectives. Yet, despite the allure that has often accompanied EA initiatives (especially from those in the IT sector), operations managers still struggle to capitalize on the promised benefits touted by IT executives and enterprise architects (Hazen et al., 2017).

EA can be comprised as a complete description of an enterprise. It describes the essential business artifacts and their relationship. Therefore, EA contains a set of principles, methods, and models that help enterprises design and realize its organizational structure and the fitting business processes, information systems, and infrastructure (Goerzig & Bauernhansl, 2018).

Besides this very general characterization of EA and its tasks, there are many different definitions and EA frameworks with different scopes and focuses. Important distinguishing features are the supported enterprise layers. There are five possible layers. In the strategic layer, EA defines products and interaction with suppliers and customers. In the organizational layer, the architect elaborates business processes, information flows and roles. The integration layer considers applications, services and interfaces. Whereas the software layer defines data structures and software components, the IT infrastructure layer works out hardware and network components as well as software platforms. Most EA approaches focus on organizational, integration, and software layer. The first well-known approaches were the Zachman framework and ARIS. Today, TOGAF is the most common framework (Goerzig & Bauernhansl, 2018).

## III. Research Method

Five stages are defined for the development of a reference EA (Gallegos-Baeza et al., 2021):

**Definition of the Organization:** This stage aims to explore the vision and mission of Co-Working Space Business in Batam, Indonesia Special Economic Zone for developing the reference EA. To review the law for the possibility of obtaining the vision and mission that it establishes for these organizations. to review the vision and mission of every involved organization that possesses them. motivational aspects of the organization The

vision and mission allow the extraction of the objectives and priority tasks of the kind of organization to consider. For example, organizations belonging to a specific region of the country.

**Selection of the Minimum Services of the Organization:** The minimum services that need to be covered by the target organizations are selected in this stage. All the potential services must be identified from sources such as laws, government documents, and organizational documents to achieve this. Once the potential minimum services have been established, criteria for selecting the set of services to be modeled must be defined. These criteria can be, for example, the impact of the service in the organization itself or its relevance for the target population. The reference EA should cover the services that can be considered as essential for the organization.

**Selection of the Framework for the development of the EA:** The objective of this stage is to select a framework for the development of the reference EA. To do this, several aspects should be considered, such as experiences of using the framework in the target context from literature, available documentation of the framework, requirements for its application, and experiences of those who will implement the EA. If those who will implement the EA do not have much experience with any framework, the ease of use and the available documentation become determinant aspects in the selection.

**Adaptation of the EA Framework:** This stage involves studying and adapting the selected framework for constructing the reference EA. To achieve this, the applicability of all of the steps or activities established by the framework must be analyzed, while also selecting the deliverables of each of them. This can be simpler if those who will develop the EA have experience using the framework. Otherwise, a considerable amount of time will have to be dedicated to studying the framework for its adaptation. In addition to the above, the notation used for modeling the deliverables and the reference EA must be defined.

**Development of the EA Reference:** The reference EA is developed in this stage. This is done based on realizing all the appropriate steps or activities of the selected framework. Based on this, the established artifacts and deliverables and the final model of the reference EA are generated.

This method requires to be systematic in its development. Moreover, it must be considered that this will be a reference model for the organizations to develop their own EAs based on it. Every organization can then incorporate new elements that reflect their particular reality in the different layers in their own EA. For example, this can be to achieve coherence regarding the elements that the organization already has implemented.

## **IV. Results and Discussion**

Using the 5-stage method defined in the previous section, the municipal reference EA for Chilean municipalities has been developed. The realization of each stage is presented in the following subsections.

### **4.1 Stage 1. Definition of the Organization**

This stage consisted of the generic definition of the co-working business through the establishment of a generic vision and mission and the business objectives that derive from them. This process is shown in Figure 1 and 2.

The vision is a general image of what an organization is or wants to be. On the other hand, the mission indicates the essential activity of the organization and continues its course tied to its vision (Walters & Plais, 2017).

In the co-working business context of Batam, Special Economic Zone, there is no generic vision or mission, so these have been constructed based on the information contained in their webpages.

Based on this generic vision and mission, the following business objectives are derived:

- To satisfy the necessities of the local community through the provision of e-services. Particularly, the minimum e-services established by the country.
- To possess a modern management, applying continuous improvement in e-services through technology for the benefit of the community.
- To promote the interaction of the co-working community using e-services.

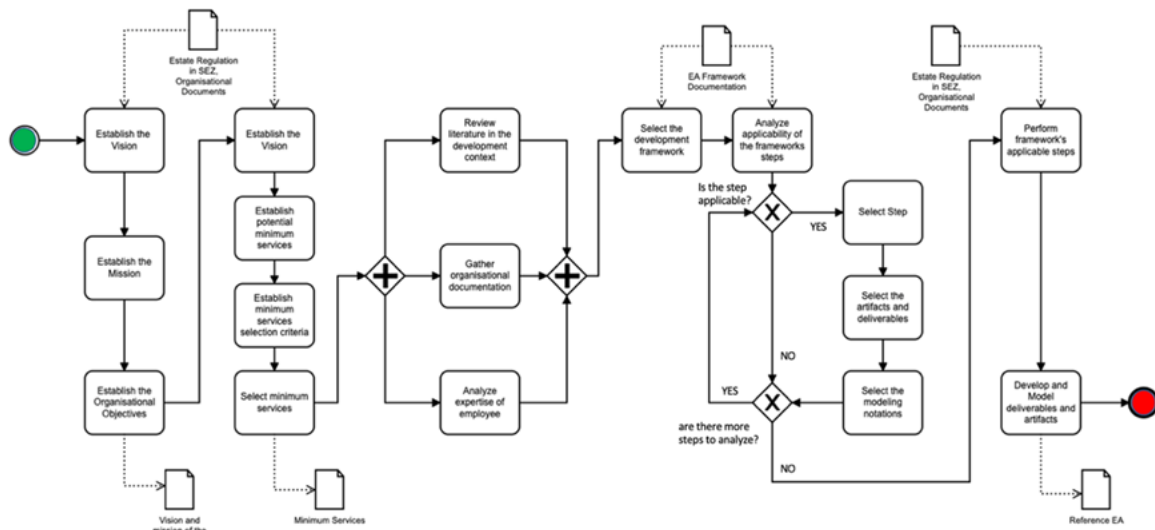


Figure 1. Reference EA Development Method

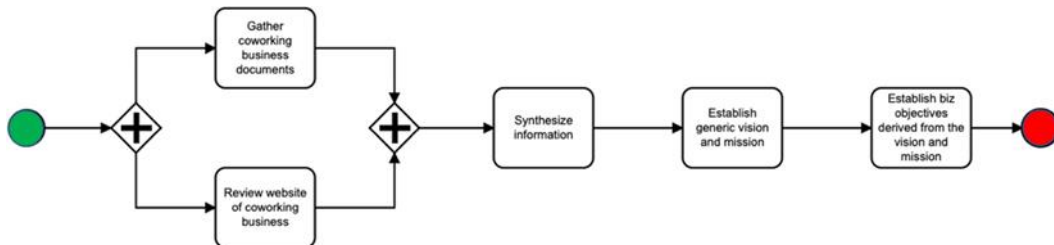


Figure 2. Definition of the Organization

#### 4.2 Stage-2. Determination of the Minimum e-Services of Coworking Business

The e-services that can be define and describe in co-working business are shown in Table 2. (Al-Hashem, 2020).

E-Service innovation refers to the service process or service product that is depend on advanced information and telecommunication technology or systematic techniques to provide benefit to both the customers and service producers, and can be new solution in the customer interface, new channels of distribution, new models of business operations with business partners, new organizational architecture, managing and organizing customer services in novel ways, adopting new technology in the business processes and improving the overall performance through human resource management (Al-Hashem, 2020).



**Table 2.** E-Service Innovation Definition and Description Contract Definition and Description

<b>Contract</b>	<b>Definition and Description</b>
E-Service Innovation (ESI)	The process of creating and adding value to services electronically.
	The process of creating new business models of services that lead to customer satisfaction in order to differentiate the organization from others in the market space.
	Service innovation is considered a transformation process of how the service is designed, developed and managed.

Based on multiple sources, the e-services that can be implemented through coworking business were identified, as shown in Figure 3.

### 4.3 Stage 3. Selection of a Framework for the Development of the Reference EA

For the selection of the framework for developing the EA, aspects such as the ease of use, provided documentation and experience of the stakeholders in relation to the framework, must be considered. Moreover, taking into consideration that, as mentioned in Section 2, TOGAF has been the most utilized development framework in the municipal context in recent years (Gallegos-Baeza et al., 2021) it has been selected as the framework for the development of the reference municipal EA. Once the framework has been selected, it is important to study it to apply it correctly. The tasks of this stage are shown in Figure 4.

### 4.4 Stage 4. Adaptation of the Framework for the Development of the EA

In this stage, the selected framework must be adapted by determining the phases, activities and artifacts that are of use for the development of the reference EA. In this case, the TOGAF framework provides the Architecture Development Method (ADM) for the development of an EA (The Open Group (2018b) TOGAF, n.d.). However, before using this method, it was necessary to analyze the applicability of its phases and establish the deliverables, artifacts, and modeling notations appropriate to the use context.

TOGAF covers the development of four related kinds of architecture, which are commonly accepted as subsets of an EA: (i) the Business Architecture, which is occupied of the business strategy, governance, organization, and key processes of the organization; (ii) the Data Architecture, which establishes the logical and physical data structure that an organization possesses; (iii) the Application Architecture, which identifies individual applications to implement, as well as their interactions and relations with the business processes of the organization; and (iv) the Technology Architecture, which analyses the software and hardware capabilities that are required to support the implementation of business, data and application services. The TOGAF-ADM considers nine phases for its application (The Open Group (2018b) TOGAF, n.d.). Out of these, the following were considered applicable for the current process, as shown in Figure 7: Preliminary, Architecture View (A), Business Architecture (B), Information Systems Architecture (C), and Technology Architecture (D).

### 4.5 Stage 5. Development of a Reference co-working business EA

(Gallegos-Baeza et al., 2021). Once the minimum e-services and the framework for the development of the EA and its adaptation were selected, the reference municipal EA was developed. Figure 5 presents the phases of TOGAF- ADM that were performed, as well as the input and output of each of them. The following subsections present the views

that will be the base for developing the reference EA, for each of the phases of TOGAF and the main layers of ArchiMate presented in Figure 4.

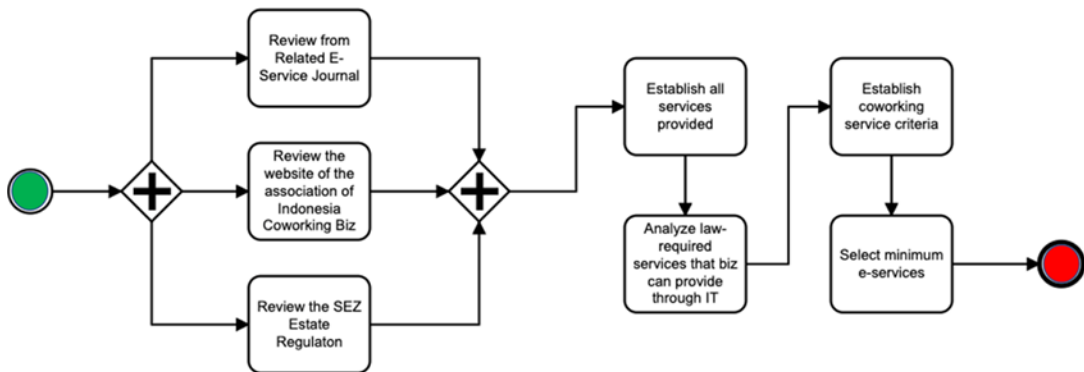


Figure 3. Stage-1. Determination of The Minimum E-services of Coworking Business.

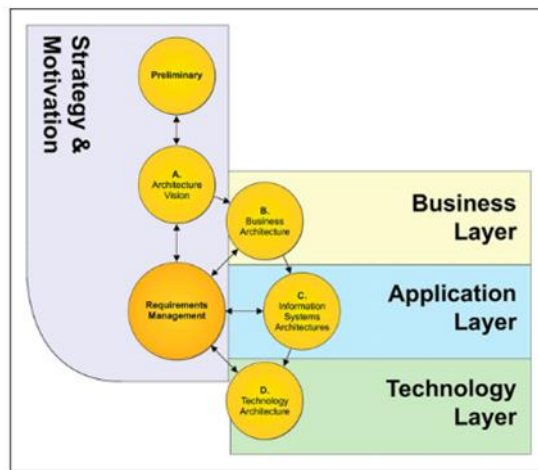


Figure 4. Selected TOGAF-ADM Phases

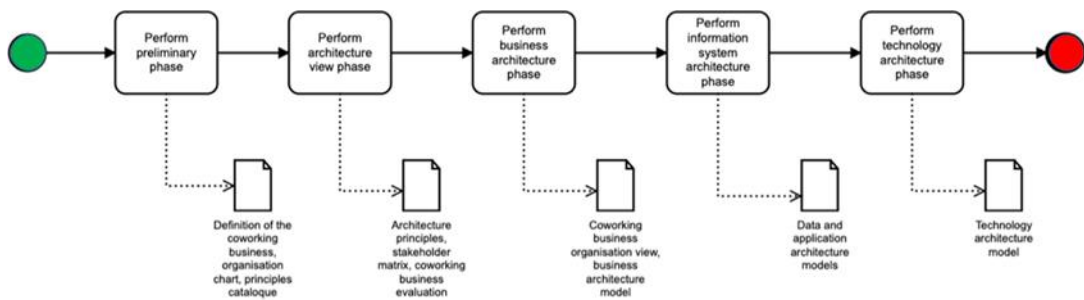


Figure 5. Stage-1. Development of the Reference Coworking Business EA

## V. Conclusion

The realization of this work has provided two main contributions. Firstly, the development of a reference business EA for coworking business, that considers a set of minimum e-services that every co-working should provide. This reference business EA for coworking business in special economic zone could be of use for business to evaluate the breaches that their EAs possess compared to the reference EA, as well as to address the problem of incorporating ICT while considering a holistic view. Moreover, this reference EA could be reutilized with the advantage of allowing to reduce the required work, the

errors and to accelerate the development of solutions. Also, this would allow obtaining a more homogeneous situation among the various municipalities of the country regarding the perceptions of community on service provision.

Secondly, the definition of a generic 5-stage method for developing reference co-working business EAs based in a set of minimum e-services that any set of this kind of organization must provide. The proposed method was defined and specified using the TOGAF framework and the ArchiMate modeling notation.

Regarding future work, three lines are highlighted: (i) the realization of a guide that allows analyzing the breaches between the developed reference EA and the EAs that model the current situation of the distinct co-working business; (ii) increasing the number of performed case studies, covering co-working business of different types (size, geographic location, income, etc.); and (iii) studying the applicability of the proposed met.

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