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Design of enterprise architecture for Yayasan Kemala Bhayangkari Indonesia Institute using TOGAF

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ABSTRACT

The World Health Organization has declared Covid-19 as a pandemic that has posed a contemporary threat to humanity. This pandemic has successfully forced global shutdown of several activities, including education activities. In this case, educational institutions also received some consequences like decreasing the number of students. This happed to Yayasan Kemala Bhayangkari (YKB) Indonesia, a government educational foundation which has more than 700 schools spread all over Indonesia face decreasing student year by year. This foundation is under bhayangkari's management. Bhayangkari is an organization that is managed by POLRI's wives. We see the schools where is out of Jawa Island, loss the students more than 50% due to covid-19 pandemic. Therefore, the design of Institution business architecture is needed to align business processes. This study begins with data collection by conducting interviews, observations, and literature studies, then performs an analysis using the TOGAF 9.1 framework. The results of this research, in the form of a blueprint which is a proposed application for Institution, it is hoped that the proposed applications can help this foundation in aligning business processes well and can achieve business goals. The conclusion of this research is that architectural design using the TOGAF 9.1 method can harmonize the business process activities of this foundation.

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INTRODUCTION

According to Huang et al. (2020), a novel corona virus, known as Covid-19, was discovered in the last month of the year 2019, in a seafood market in Wuhan, China. This pandemic has forced global physical closure of businesses, sport activities and schools by pushing all institutions to migrate to online platforms with no choice. Institution is one of the educational institutions in Indonesia. This educational foundation itself is an institution that organizes educational, teaching and learning activities. In its business activities, all of schools belong to Institution currently does not have an

integrated information system architecture and does not fully support existing business processes at this institution, such as the New Student Admission (PPDB) process, learning program planning, and other activities, which are still being carried out with the conventional way of recording or managing using Leger, Microsoft Excel and Microsoft Word. This is because this institution is currently not using and maximizing the use of information technology and information systems that can facilitate the management of diverse data at the institution. This paper will discuss about a proposed application for institutions that will be align with update business process which is standardized modern schools which is will be supported with update Information Technology in order to achieve their business goals. Besides that, it also will create new designs and strategies using Togaf 9.1 by providing comprehensive awareness of Covid-19 challenges. So, hopefully the final recommendations will delivery new strategy that can be adopted by teachers and students, facing the challenges and opportunities as the world battle to eradicate the pandemic.

RESEARCH METHOD

This study discussed the process of developing information technology (IT) blueprint needed to support performance improvement in the educational institution . Moreover, the method chosen in this study was TOGAF 9.1. The data was based on the result of the reference of the collection study compared the top four EA Frameworks, e.g., Zachman Framework, TOGAF, Federal Enterprise Architecture (FEA) Framework, and GartnerFramework through a Likert scale (1 = Very Bad, 2 = Inadequate, 3 = Good, and 4 = Very Good). There are some criteria were used to evaluate the four frameworks. TOGAF is showed the highest average score.

The data collecting technique was carried out through two techniques e.g., interviews and observation. These two techniques were chosen because they were the most suitable for extracting information and getting a clear picture of the object of research. In this matter, the object under study was the implementation of the educational process of the Institution. There were nine several stages set out in TOGAF as follows:

Phase A : Preliminary Phase

This phase required the preliminary phase to develop the architectural capabilities e.g., customizing TOGAF and defining architectural principles. The purpose of this phase was making the architectural processes successful. In this phase, the architecture must be specified through who, what, why, when, and where questions.

1. What was the scope of the business?
2. Who would be responsible for working on the architecture
3. Where the architecture would be allocated? How was its role?
4. How did EA determine? How
5. were framework and methods used to capture information?
6. When was the completion of the architecture?
7. Why was this architecture built? This related to the organizational goals; and, how did the architecture meet organizational goals?

Phase B: Business Architecture

This phase included the developing business architecture to support the architectural-agreed vision. At this stage, the general tools and methods for modeling were: Integration Definition (IDEF) and Unified Modeling Language (UML). They were used to build the required model. Some of the objectives of this phase were as follows.

1. Describing a basic business architecture description.
2. Developing business architecture objectives.
3. Outlining product and / or service strategies and geographic, informational, functional and

organizational aspects of the business environment based on business principles, business objectives and strategic drivers.

4. Doing the gap analysis between the current architecture and goals.
   Determining the relevant point of view that allowed the researcher to demonstrate how stakeholder intent was achieved in the business architecture.
5. Determining the relevant tools and techniques used in the selected viewpoint.

Some of the steps taken in this phase were as follows.

1. Developing a description of the current business architecture to support the target business architecture.
2. Identifying reference models, viewpoints and tools
3. Complementing the business architecture
4. Conducting gap analysis and make reports

Phase C: Information Systems Architectures

At this stage, the information system architecture was developed. The definition of information system architecture in this stage included the data architecture and application architecture used by the organization. The data architecture focused more on how the data was used for the needs of business functions, processes, and services. The techniques used in this study were the Entity Relationship Diagrams, Class Diagrams, or Object Diagrams. The objective of this phase was developing the architecture in the data and application domains. The scope of the business processes supported in the phase C was limited to the processes supported by IT and the interfaces of those processes related to non-IT. The implementation of this architecture needed not to be in the same order, however, the precedence was needed.

Some of the steps required to create the data architecture were as follows:

1. Developing a description of the basic data architecture.
2. Reviewing and validating of principles, reference models, viewpoints and tools.
3. Creating architectural models
4. Choosing a data building block architecture
5. Completing the data architecture
6. Performing the gap analysis of current data architecture with target data architecture and create reports.

Phase D: Technology Architecture

Developing the technology architecture was started from determining the type of technology candidate by requiring Technology Portfolio Catalog including the software and hardware. In this stage, it also considered the alternatives needed in determining the technology. Some of the steps needed to create technology architecture were as follows:

1. Creating basic descriptions in TOGAF format
2. Considering different architectural reference models, viewpoints and tools.
3. Creating an architectural model from building blocks.
4. Selecting the portfolio services required for each building block.
5. Confirming that the business objectives are being achieved.
6. Determining the specification selection criteria.
7. Completing the architectural definition.
8. Conducting a gap analysis between current technology architectures and technology architectures target.

Phase E : Opportunities and Solutions

The EA team identifies opportunities and looks for the best solutions to any arising or previous issues. The phase identifies key phases, change parameters, top-level projects, and more. A firm

helping an enterprise achieve the proper infrastructure will repeatedly use TOGAF ADM Cycle. Doing so ensures that the best model is achieved without leaving any core elements. The EA team invests in proven methods to accomplish this

Phase F : a migration plan

Having a proper migration plan ensures a seamless transition. It incorporates all the essential elements and spells out the mode of implementation according to priority. Cost assessment, benefits, dependency evaluation, are some of the activities factored in.

Phase G : Implementation

The Implementation phase focuses on implementing the changes in the Architecture Roadmap and Implementation Plan. Also, it takes into account helpful information from other implementation projects. Good architecture governance helps to manage a project successfully while experiencing minimal risk.

Phase H : Architecture Change Management

Architecture change management involves ensuring the benefits expected from the target enterprise architecture are being achieved. As well, we make sure the target architect applies to the organization's current circumstances and ecosystem. It specifies the key attributes, target point, and how to manage the exercise. The phase works with the Architecture Requirements Management process and is continuous.

TOGAF Phase H - Applying Agile and our recorded Webinar True Life EA Webinar: Agile COVID-19 Response explain real-work realization of Enterprise Agility led by best-practice enterprise architects. Enterprise agility is all about the ability to respond to unanticipated opportunities and threats.

RESULTS AND DISCUSSIONS

Based on observations and interviews show that in this educational institution there is no blueprint for designing the architecture of enterprise information system that will support its business processes and it still using a manual process that will not be delivered properly. When creating an enterprise architecture blueprint, it will use the TOGAF 9.1. Architectural design enterprise will refer to the architecture of the vision phase, a phase of business architecture, the architectural phase of information systems and Technology Architecture Phases. This research is the blueprint for the guidelines for creating information systems so that they can support the ongoing business processes. The following are phases of the TOGAF 9.1.

Preliminary phase

This phase will explain preparation and initiation to EA, including the definition of organizational identification, the destination organization, organization model for the EA and principles of architecture. This foundation is going to be implementing of education institution and culture with the function as an organization is in charge has the task to develop and empower the workforce educators and educational personnel in the field of education. In preparation for the development of EA is designed to implement the blueprint of business process of education institute. The principle of architecture is the basis for the development of EA. Architecture principles developed to consist of business principles, principles, the principle of data and application of the principle of technology. The results of the interviews and document strategic planning studies can be identified as follows: the principle of a prescribed business will make educators and staff education to become a professional in accordance with the standards. By developing the professionalism of educators and educational staff of the institution will become the standard

institutions. The principle of data consists of data assets, shared data, the data can be accessed, and data security. The principles of technology change management consists of responsive and interoperability.

Architecture vision

Vision architecture delivers enterprise architecture vision is proposed. A high-level description of the basic architecture and architecture target architecture vision is provided by a domain that includes business, data, application, and technology with the objective to achieve a target architecture that integrates business applications, technology infrastructure, and the needs of the organization. Determining the vision of architecture is an important step to analyse the value chain of the organization. The result is an analysis of the value chain that includes the domain and business functions and supports the core business functions in the organization. The purpose of the analysis of the value chain is to process identification in the Organization and providing the highest margins to its stakeholders.

In this phase, the need is to identify the business goals and strategic drivers of the organization. The vision of architecture can be determined based on the company's current condition and mission of the educational institute itself.

Core activity includes,

1. Inbound Logistic : A new student admission
2. Operation : Learning and teaching process
3. Outbound Logistic : Student
4. graduation
5. Marketing and Sales : Promotion for siblings
6. Service : Free consultation for parents

Supporting activity includes,

a. Human Resource : Training and payroll
b. Procurement : Miscellaneous and Educational facilities
c. Firm infrastructure : finance departmenet

Business Architecture

In this stage, the business architecture describes the architecture of the current organization and expanding it with drawing up strategies to achieve business goals stated by conceptualizing information systems-based business solutions based on the current conditions.

Figure 1. A new student admission

Figure 2. Learning and teaching process

Information System Architecture

This phase involves two data architecture, including architecture and application architecture, focused on the identification and determination of the applications and data that supports the business architecture.

Application Architecture

The purpose of the application architecture section of the application architecture phase is to develop the target application architecture that allows the business architecture and vision architecture that can function adequately based online and in real-time so that all of the Program and Reporting at the institution can obtain information anytime and anywhere. This had an impact on the achievement of business functions, especially in this institution.

To fulfil institute requirement, we are going to develop three application, includes :

1. A new student admission application
2. Learning and teaching application
3. Finance management application
4. Learning program application

Data Architecture

In the architecture of data, stakeholders of the institution requires an integrated and centralized data from various work units aimed at improving the coordination and synchronization of business processes and information can be delivered timely, accurate and relevant. After the data is integrated, it is expected to create information that is timely, accurate and relevant.

Technology Architecture Phase

At this stage to explain the technology architecture can support the vision and business strategy. Building design for the information system that can be integrated with the other parts of the company based on the analysis that has been done before. It can be seen in the selection of technology for platform technologies in applications, ranging from application software, network and security technology, and the internet architecture that supports the application.

Figure 3. Technology and network architecture

In designing and developing enterprise architecture that fits the needs of educational institute, some things that should be considered include business goals, business drivers, business constraints. In addition, companies should also consider the scope of architectural design company itself as well as the scope of application of the framework for enterprise architecture will be used. Because the proposed method using the TOGAF 9.1 framework as a basis in the process of development, this method also provides a tested and repeatable process for developing the EA as given by the TOGAF 9.1. Method Development IEA provides the process step by step in the overall process of development which includes project planning on phase 1 (start), assess the current state of the in phase 2 (identify), the design of future detailed in phase 3 (sets), planning transitions in phase 4 (plans) and implementation in phase 5 (implement). It also provides the institution design, compliance documents,standards, and guidelines in phase 3 (determine) to guide institution entities in applying EA in their environment. It concerns changes in the future by providing evaluation and monitoring mechanismsand uses recurring processes in the business and it can cause the spread of new Stage 6 (evaluation).

Implementation of the business transformation depends on the vision given by leaders and its managers on the project organizational transformation, where the establishment of the office architects is fundamental to solve business problems through a framework architecture. The institute also should be managed based on the reference model that corresponds to the current state, this model should be launched in long-term projections, and it will improve the structure of the business where the institution.

CONCLUSION

The conclusion of the implementation of the TOGAF 9.1 in YKB Indonesia can be reached that is the process of designing enterprise architecture using the TOGAF 9.1 can be used in the institute in accordance with documents and processes that are currently running and able to produce a blueprint for making the reporting information system so that they can support business processes ongoing, solutions offered for reporting information system mobile and web-based technology platform and integration for each proposed information system is a Service Oriented Architecture (SOA). And we hope for the next research can be created a platform that can integrate and connect all of school's branch of Yayasan Kemala Indonesia in 36 provinces.

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