Designing Enterprise Architecture for Marketing Advertising Media System Based On TOGAF Architecture Development Method

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Abstract. The purpose of writing this paper is to design an enterprise architecture that is able to meet the needs of business functions. The method used in this study was through collaboration between researchers and sources in the company which was the object of research and based on the application of various theory from the literature. The initial stage is through direct observation, collecting materials, and through interviews. The result of integrating two or more systems to be able to exchange data or information for being used later by the system that needs it, it will be the reason why the standardization of communication facilities used to communicate and data redundancies is needed. This paper will discuss the design of an integrated enterprise architecture marketing system based on the relevance of each function in an enterprise. The Conclusion of this study uses enterprise architecture planning methods based on the TOGAF framework approach. This designed model is expected to be a guideline when developing advertising services marketing systems in the future. The enterprise architecture design is more specialized in TOGAF ADM, which produces a blueprint.

1. Introduction

Enterprise architecture is an important thing in a company, to help achieve business functions. TOGAF is a methodology and framework of Enterprise architecture that has been proved and can be used by various types of organizations that function to improve business efficiency [1]. The enterprise architecture design is more specialized in the TOGAF Architecture Development Method (ADM). ADM is the core of TOGAF, which is a generic method that can be applied to different architectures [2].

PT. X is a company engaged in the field of advertising service providers in the city of Bandung. Advertising is drawing attention to something or giving information to someone about something [3]. There are various ways of giving information to someone, among others, can be from words, unofficially and without incurring enormous costs. To provide information for a large scale, it can usually be through media or public announcements, such as through television, radio, or advertising media provider services such as Neon Boxes, Billboards and LED displays so that information can be conveyed [3]. However, in order to market services provided to prospective customers, the marketing division of PT. X does not have a system that can support its function, so it is only done manually. This can interfere with the marketing activities of the company because in checking the availability of
media in a particular location, the marketing department must first contact the relevant department so that the availability function of the data does not work. To overcome this, the use of technology today has become a tool to support business activities. This greatly facilitates business people in getting information accurately and quickly, so that the objectives of a business or job can be achieved effectively and efficiently. It is critical to developing necessary planning as early preparation of a great system and service to meet the needs of the company and fulfill the company’s vision and mission [1].

From this, it was the initial idea of research need for Designing Enterprise Architecture for Marketing Advertising Media System at PT. X Based On TOGAF ADM. TOGAF can be used to develop a wide range of enterprise architecture and can be used in conjunction with any other framework that focuses on a particular sector as designed as a generic framework [1-4]. TOGAF as one of the work agreements that have support set to develop the Enterprise Architecture can be used to support the Enterprise Architecture at PT. X. The selected TOGAF is TOGAF ADM. TOGAF ADM is a generic method that can be applied to a broad range of different architecture [2].

Based on the following problem formulation, the purpose of the research is to produce a design of the Enterprise Architecture using TOGAF ADM which also produces information system architecture designs consisting of data architecture, application architecture, and information architecture. With this design, it is expected to provide benefits to PT. X fulfills the company’s business functions from future solutions presented in the final architecture.

2. Method

The methodology used was research carried out through collaboration between researchers and sources in the environment which was the object of research and based on practices originating from the literature to take information system architecture designs. The initial stage was through direct observation, collecting materials related to documents and through interviews.

This research was conducted at PT. X marketing section. PT. X is a company engaged in advertising service providers in the city of Bandung. PT. X itself has yet to have EA to support the process. So that the data needed in this study, obtained from interview activities with the marketing department and direct observation during marketing activities.

The EA blueprint was produced from data analysis data obtained, and the analysis carried out during the observation activities at PT. X marketing section (Figure 1).

Figure 1. Architecture Development Cycle.
TOGAF ADM was a result of the continuing contribution of a large number of architectural practitioners. This explained methods for developing and managing the life cycle of a company's architecture and forms the core of TOGAF. It integrated the TOGAF elements described in this document as well as other architectural assets available, to meet the business and IT needs of an organization [1]. The Basic Structure of the ADM is shown in Figure 1.

3. Results and Discussion

Based on observations made, marketing activities are carried out by the marketing department at PT. X cannot be implemented optimally, because no system can help the company's business functions. Especially when prospective service users want to know what location and media are still available and ready to use, also to find out the remaining time the media used is using, as a reference for prospective service users, when it can be used, where it is located and what media is used to advertise through PT. X.

In making an Information System blueprint application, it refers to TOGAF ADM, which divides the company's architecture into four categories: business architecture, data, applications, and technology. The stage of corporate architecture planning refers to the TOGAF ADM stage which consists of five phases of activities needed in building architectural information systems, including architectural vision, business architecture, information system architecture, technology architecture and opportunities, and solutions. Further explanation of each TOGAF ADM phase is as follows:

3.1. Preliminary Phase

In this phase, one of the things that are done to confirm the commitment of the stakeholders, the selection of the framework used, and the Enterprise Architecture design principles where it is inputted in this phase. As for the output generated from this phase, namely: commitment from stakeholders, the framework used, and architecture design guidelines [5]. Enterprise architecture principles can be seen in Table 1.

| Principle Category      | Principles Name                          |
|-------------------------|------------------------------------------|
| Business Principle      | Business Continuity                      |
|                        | Provide Benefit for Company              |
|                        | IT Responsibility                        |
|                        | Increasingly advanced business function  |
| Data Principle          | Data security                            |
|                        | Data Availability                        |
|                        | Data Accessibility                       |
|                        | Integrated data between units            |
| Application Principle   | Affordable cost                          |
|                        | Reliable                                 |
Easy to use

Technology Principle
- Responsive to all changes in the company
- Interoperability

3.2. Architecture Vision Phase

The objective of this phase is to develop a high-level aspirational vision of the capabilities and business value to be delivered as a result of the proposed enterprise architecture and Obtain approval for a Statement of Architecture Work that defines a program of works to develop and deploy the architecture outlined in the Architecture Vision [1].

In this phase, identification of the business goals and strategic drivers of the organization is needed. The architectural vision can be determined based on the current condition of the company and the mission of the company itself.

3.3. Business Architecture Phase

In this stage, business architecture describes the current organizational architecture and develops it by devising a strategy in order to achieve the stated business goals by conceptualizing information systems-based business solutions based on current conditions. In the marketing department, there are several activities carried out to market services to prospective service users, and the marketing section is also one of the most important parts of the company. As seen in Figure 2 explains the examples of how to analyze business processes at PT. X for marketing operational functions.

![Figure 2. Marketing Operational Use Case](image)

3.4. Information System Architecture Phase

This phase involves two architectures, namely data architecture and application architecture, focus on identifying and defining applications and data that support business architecture.

3.4.1. Application Architecture Phase

The objectives of the Application Architecture part of Phase Application Architecture is developed the Target Application Architecture that enables the Business Architecture and the Architecture Vision
while addressing the Request for Architecture Work and stakeholder concerns. A platform is needed for the marketing department that can function adequately, online and real-time based so that the marketing department can get information anytime and anywhere because the marketing department spends more time working outside the office area. This has an impact on achieving business functions, especially in the marketing department.

The application architecture is associated with data and system users; the description of the application is separated into two, logically and physically [1]. As seen in Figure 3, Logical application components emphasize how to describe system requirements logically through procedures, functions, and services in the system.

![Logical application architecture](image)

**Figure 3.** Logical application architecture

### 3.4.2. Data Architecture Phase

In data architecture, data used by the marketing department such as the availability of media, the remnants of contracts from the media that have been used, and the price of media which is from other units. Which aims to improve coordination and synchronization of business processes and information can be delivered in a timely, accurate, and relevant manner. Once the data is integrated, it is expected to be able to make information that is timely, accurate and relevant. Table 2 explains the gap between the target and the current situation and the recommendation for fulfilling the target. The target covers two things regarding integration and framework implementation.

| Target                                      | Baseline                                      |
|---------------------------------------------|-----------------------------------------------|
| 100% Business services and processes can be integrated | No system can integrate services between parts |

Recommendation:
An integrated system is created to support business for business processes.

Implementation of the framework. The framework has not been implemented

Recommendation:
Determine which Framework will be applied, conduct training for staff and carry out the integration process between applications.

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Table 2. Data Architecture GAP Analysis
The data architecture, as shown in Figure 4, is made through the identification of business function entities and organizational entities. Identification results are mapped into class diagrams.

![Figure 4. Data architecture for business functions marketing operations](image)

3.5. Technology Architecture Phase

This stage defines a technological architecture that can support the vision. Based on the analysis that has been done before, carried out a design for an information system that can be integrated with other parts of the company. Can be seen in Figure 5, the selection of technology for technology platforms in applications, ranging from the application software, operating systems, networks and security technology, and internet architecture that supports applications.

![Figure 5. Technology architecture for models internet architecture](image)
Enterprise Architecture helps an enterprise to captures the essentials of the business, IT, and its evolution. Enterprise Architecture is a coherent principle, methods, and models used in the design and realization of organizational structures, business processes, information systems, and Enterprise Infrastructure [6]. From previous studies using TOGAF ADM, among others, stated that in its implementation, TOGAF ADM does not always have to use the whole phase. The use of ADM in designing an enterprise architecture must be applied sequentially between phases, and the whole process [7]. However, as long as the ADM cycle takes place, there must be a validation of the results of the original situation, either in whole or in certain phases. It considers the scope, time, schedule, details and objectives to be achieved from each phase. The logical and conceptual analysis in this discussion still covers all domains of architecture, namely business, data, applications, and technology.

Consideration of time and research needs, doing this research using ADM only carried out until the fourth phase. In overcoming a problem as well as research objectives to be achieved, the results of architecture that are most relevant to business problems handled by EA, are things that must be considered in a focused manner by the organization [8]. The appropriate definition of each ADM phase still opens space for implementation flexibility for EA architects in determining what activities are needed for an EA project with a set of possible results. Documentation of design rationale, suggested by ADM to know and determine the architecture needed [9]. In some cases of enterprise architecture adaptation with TOGAF, it can ignore most of the core recommendations, and most of it build enterprise architecture based on conventional ideas that make more sense [10]. Various kinds of architectural models can be created or produced by TOGAF to facilitate work and carry out integration, in order to adapt in the future [11].

4. Conclusion
Based on the results of the study, the conclusions obtained are the enterprise Architecture planning using TOGAF ADM using part of the entire ADM phase, can be done at PT. X, in accordance with existing documents and processes that have been running, to produce a blueprint for the application of Information System that can support business functions. Also for Designing Enterprise Architecture to develop business processes requires the commitment and support from stakeholders. As for the solutions offered for the marketing department of PT. X is based on mobile and web, which includes integration with other units.

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