Designing of Enterprise Architecture for Interior Furniture Production Based on TOGAF 9.1

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Abstract. The purpose of this research is to plan and design an Enterprise Architecture according to the needs and capabilities of CV. XYZ. In this research, the method used to design Enterprise Architecture was The Open Group Architecture Framework (TOGAF) Architecture Development Method as a framework that would help to design the CV. XYZ. This research only used four phases of the nine phases of the existing Architectural Development Method. The output from the preliminary phase was input to the initial phase of the Architectural Development Method phase, in the architecture of the input vision resulting in the business process structure that would be proposed. In the next phase, the relationship between business processes and company divisions is illustrated. Which will later be the beginning of the development of information systems architecture and technology architecture. The conclusion of this research is the blueprint for corporate architecture design that will be recommended from the results of research that has been done correctly and is expected to help improve business processes to be more organized so that the company's vision and mission become clear in the interior production division of furniture at CV. XYZ.

1. Introduction
Enterprise Architecture (EA) design presents an overview of the appearance of interconnected parts and relational steps, in harmony with explaining each part element [1]. Enterprise architecture is technology planning and management that can help the development of companies by understanding the current condition of the company in terms of a holistic and interconnected perspective between existing technology resources, information flow, business processes, and strategy guidance [2]. With the architecture design, a good enterprise is expected to be able to the realization of harmony between technology information and business needs that can run business processes in accordance with the objectives and the target of the company [3]. Choosing the EA framework as an information system development will accelerate and simplify the development of architecture that allows architecture to be adapted to future organizational development (Fattah, 2012), because the creation of information systems is not adapted to technology architecture, can produce technology that is not aligned with organizational goals (Setiawan, 2009) [4].

The Open Group Architecture Framework (TOGAF) can support a complex, detailed framework and tools that are useful in supporting business development and helping improve the performance of IT infrastructure [5], the impact that will occur from the results of the EA Information Technology (IT) project as a basis for model planning, implementation, and control systems and information technology.
EA framework used in this research is a Framework for Open Group Architecture (TOGAF) consisting of four domain architecture, the business architecture, data architecture, applications architecture, and technology architecture [6]. Information technology can provide convenience and speed in business processes. CV. XYZ is a company engaged in the planning and production of interior furniture. According to Project Manager CV. XYZ, the furniture making refers to worksheet design from the architecture section, but for the production process do not use information systems to monitor material needs. So far only rely on conventional estimates and calculations. This is an unknown risk because of that CV. XYZ requires an information system that can provide better and more organized data reporting. The purpose of this research is to plan and design an Enterprise Architecture according to the needs and capabilities of CV. XYZ. Development of corporate architecture is very useful, including in terms of assets, costs, and capabilities. In this research, the method used to design Enterprise Architecture is The Open Group Architecture Framework (TOGAF) Architecture Development Method as a framework that will help to design the CV. XYZ. This research only uses four phases of the nine phases of the existing Architectural Development Method. The preliminary phase, architecture vision phase, business architecture phase, information system architecture phase and technology architecture phase. If the goal of decision-makers on the CV. XYZ realizes and understands how the conditions and needs of the Enterprise architecture actually can have an impact on increasing the subdivision. As a framework for supporting architectural enterprise that will be recommended to CV. XYZ uses TOGAF ADM method where each phase can be inserted and the business stages are more comprehensive.

2. Method
The methodology used was research obtained from the collaboration between researchers and resource persons in the environment that was used as the object of research and the stages that would be applied to companies based on criteria derived from the literature to take business architectural designs especially in the production section. The initial stage was carried out through direct observation, collection of materials regarding documents and through the interview stage. This research was conducted by direct observation and analysis of data collection, current state of the architecture, application of business model architecture, data architecture, technology architecture, and data by comparing the current architectural framework. TOGAF provided very clear detailed methods on how to create, control, and implement the corporate architecture and information systems that were the Architecture Development Method (ADM) [7, 8] (see Figure 1).
Figure 1. TOGAF ADM [7, 14]

The following was the explanation of the TOGAF phase in Figure 1:

Phase A:
Architecture vision was the stage initial of ADM (Architectural Development Method). This included information about the definition of the scope, identification of stakeholders, architecture vision, and approval.

Phase B:
The business architecture defined the initial state of business architecture and determined the business model or desired business activities based on business scenarios.

Phase C:
Information system architecture at this stage, there was more emphasis on the activity of information systems architecture developed.

Phase D:
Technology architecture built the desired technological architecture, starting from determining the type of technology candidates needed.
3. Results and Discussion

Based on observations and interviews, it can be seen that the business processes that are running in the interior production of furniture at CV. XYZ requires a corporate architecture blueprint consisting of 4 categories: business architecture, data, applications, and technology. The stage of corporate architecture planning is supported by the TOGAF ADM framework. Improving the framework for managing the use of all Architectures Development Method (ADM) guidelines and techniques, architectural connectivity TOGAF framework, company of sequence, TOGAF model and skills framework, according to the TOGAF survey results [8], what will be done in this study uses four phases as recommendations including: architectural vision phase, business architecture phase, information system architecture phase, technology architecture phase. The explanation for each TOGAF ADM phase is as follows:

3.1. Preliminary Phase

The purpose of this phase is to prepare an enterprise architecture analysis to be carried out so that it is expected to be in accordance with what is needed in the company. In this phase the catalog framework will be produced as follows:

1. Business Architecture
   a. Produce productive resources
   b. Prioritizing work safety
   c. Environmentally-friendly production process

2. Data Architecture
   a. Data is a company asset
   b. Data can be accessed (accessible)
   c. Data can be trusted
   d. Data is protected and guaranteed security

3. Application Architecture
   a. Ease of use
   b. The accuracy of the application with the business
   c. Application flexibility
   d. Application security

4. Technology Architecture
   a. Ease of technology
   b. Technology security
   c. Technology interoperability

3.2. Architecture Vision Phase

The architecture vision phase is intended to state that architectural design is made according to the needs of the organization and ensure that some aspects analyzed for this phase include vision and mission, organizational goals, strategy objectives, scope, and stakeholders.

3.3. Business Architecture Phase

The business objective of the architecture phase is to explain a number of supporting factors to the target that will explain the functions that exist inside the CV. XYZ. Some functions of this business consist of production functions. In the production function, there are several operational activities which are the main activities in the production factor. Also there are 4 important interrelated elements in the production process including production plan, material preparation, product manufacture, product control. All of the 4 elements have stages of each related function. The following is the production function as seen in Figure 2.
3.4 Information System Phase

Information system architecture phase will describe the aspects of application architecture and data architecture that will be linked to the intended production process where the needs will produce inputs and outputs that are expected and aligned with the needs of the production process. Based on the results of research from 4 production elements that are needed a consistent flow, including starting from production planning if assisted with impact information technology will accelerate the exchange of data in the process of scheduling and planning in accordance with the implementation, preparation of materials will be helped by a clear schedule and planning, also with the manufacturing process. With the support of the compatibility of materials and manufacturing process, data can be easier, and at the supervision stage in production with the help of information technology, it is expected that errors found in the control phase can be minimized. The following is a diagram that will describe the entity that must be done to help achieve the information system phase, as seen in Figure 3.
3.4.1. Application Architecture
The application architecture that is needed is an information technology system that can provide convenience in accessing it and supporting the smooth production of interior furniture in CV.XYZ it is online-based so that it can be flexibly accessible anytime and anywhere. The information technology system needed must be dynamic and real-time according to the timelines so that it can help as decision-makers by the leaders.

3.4.2. Data Architecture
Existing Data Architecture must be able to be made centrally so that every available data can be managed with efficient time and speed when accessing it so that each related part in handling it is more appropriate to avoid delays in sending and reporting so as to increase cooperation and coordination of each related part.

3.5 The Technology Phase
Architecture that will be designed is the technology needed as support and specifications that need to be adapted to the needs so that the information technology system runs, which can launch the company's business processes in application, data and database storage in the CV. XYZ which is currently not fully supported by information systems that are expected to be able to be connected between divisions that should be available to the company in order to create business goals, the results of this research are illustrated as there are 4 client computers that are connected to online-based servers to achieve fast and accessible access to data and customers easily with no time limit. The following is a description of the diagram and its layout as seen in Figure 4.

Figure 3. Logical Application
From the analysis of technological requirements that have been described, it is necessary to design that can help deal with problems in the company. So the solution is to make infrastructure design. Web Service is a design that can be used to build applications. With the concept of web service-based, applications can be made online to facilitate access anywhere and anytime so that the exchange of data between units can be more efficient and flexible.

Planning with the TOGAF ADM framework enterprise architecture includes: modeling business design architecture generated by businesses that are related to scope application based on data analysis needs, technology platforms to support the proposed application need to rejuvenate hardware and improve the technology. This enterprise architecture modeling provides guidance in making blueprints for information system development for data implementation, application, business and technology [9]. The use of TOGAF can produce planning in the form of a list of applications and technology design that fits the needs of the organization. The use of TOGAF produces the required architectural design technology and architectural design is recommended the application by the functional field and the priorities it builds is determined by the organization's stakeholder agreement [10].

4. Conclusion
Based on the results of architectural enterprise design in the production section at CV. XYZ can be concluded that the design of EA using the TOGAF ADM Framework is carried out only until the technology architecture phase because it is based on the company's needs to do production based on previously agreed orders between the company and the customer which then after the negotiation and planning phase-space measurement and material selection and design recommendations are offered as shadows of requests that have been mutually agreed upon. To support business processes that will be applied to the company, an Enterprise Architecture will be implemented later so that the proposed
information system can be in accordance with the business needs of the CV. XYZ which will later be integrated with each other between sub-parts of the company.

Acknowledgement
We would like to express our sincere gratitude to Assoc. Dr. Ir Eddy Soeryanto Soegoto, M.T as Rector of the Indonesian Computer University, and all parties involved.

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