Designing Enterprise Architecture in Koperasi Karyawan using TOGAF Architecture Development

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Abstract. The Open Group shows that Enterprise Architecture (EA) can produce an IT blueprint that can be used to determine business, technology, and information to support the achievement of an organization's vision and mission. EA can also be seen as a model, a set of principles and methods used to produce the actual organizational structure of a company with business processes used including business operations, business planning, information technology, and information systems. EA is also in the form of models, graphics and narratives that will explain the scope of a company's business processes and design. Koperasi Karyawan TEKAD do not yet have information systems and operations are driven by manual system. The purpose of this study was to design an EA, specifically in Koperasi Karyawan using the TOGAF framework. In other words, this architecture was created by emphasizing the relationship between IT and business. The EA model is intended to maximize business alignment with IT in all situations, but depends on the nature of the business and the capacity in business and IT management in Koperasi Karyawan. This EA design produces a blueprint that can be used so that service quality and performance can be improved.

1. Introduction

The current condition is that Koperasi TEKAD has not used an information system to support its business. Based on interviews with administrators, information systems (IS) and information technology (IT) should have started to be built considering that their members are getting bigger. The administrators and managers also concurrently lecturers and university employees, often the affairs of Koperasi become unmanaged because it requires a long time. Information systems and information technology are expected to provide solutions to this problem. Koperasi as an organization can be seen as an enterprise, and to support the vision and mission of an organization requires an Enterprise Architecture (EA) plan.

Information systems and information technology not only provide increased efficiency and effectiveness of organizational performance, but also have become a major empowering organization to carry out business processes and achieve the business goals of the organization by: enabling new ways of managing the organization, increasing productivity and performance, developing new businesses and provide competitive advantage [1].
The Open Group suggests that EA can produce an IT blueprint that can be used to determine business, technology and information to support the achievement of the vision and mission of an organization [2]. EA can also be seen as a model, a set of principles and methods used to produce an enterprise organizational structure that is true to the business processes that are used include business operations, business planning, information technology and information systems. EA also takes the form of models, graphics and narration that will explain the scope of business processes and the design of an enterprise [3].

The purpose of this study is to design an EA, specifically in Koperasi Tekad using the TOGAF framework. In other words, this architecture was created by emphasizing the relationship between IT and business. The EA model is intended to maximize business alignment with IT in all situations, but depends on the nature of business and capacity in business as well as IT management in Koperasi.

2. Method
This research is a research and development (Research and Development) because this research aims to produce or develop a product in the form of a blueprint instead of research that finds theory. Because the output produced from this research is a product in the form of Blueprint Corporate Architecture in Koperasi TEKAD Semarang, the design uses the TOGAF ADM framework. The first stage as an introduction is to determine management requirements in full by the framework. At this stage, researchers conduct information searches and analyze needs by conducting interviews with Tekad Koperasi stakeholders. Stakeholders are manager and members of Koperasi. This aim is to determinate targets and desired steps with the new system.

The next step is to identify the problem. This stage is carried out by conducting interviews with stakeholders in this case the management and members of Koperasi Karyawan TEKAD. Then a meeting was held to determine the requirements. This is adjusted to the goals of the organization. Next, design the business architecture by showing the current architecture (baseline) and the proposed architecture. During this stage, a gap analysis is also carried out between the baseline and the target. Data architecture and applications are carried out at a later stage. And finally the architectural design of technology in this case in the form of network infrastructure and hardware design. The resulting blueprint is an amalgamation of business architecture design, data, applications, and technology.

3. Results and discussion
The Open Group Architecture Framework (TOGAF) is a framework and method that is widely accepted in the development of enterprise architecture. The Open Group Architecture Framework (TOGAF) provides a detailed method of how to create, run and implement enterprise architecture called the Architecture Development Method (ADM) [3]. ADM consists of several stages needed to build an EA, the ADM stages as shown in Figure 1, which is a flexible method that can search for various techniques in modeling that have been used in a design, because this method can follow developments as well during the design run. The Preliminary Phase describes the preparation and initiation activities required to prepare to meet the business directive for a newenter prise architecture. Based on observations and analyses conducted on all activities, there are several problems experienced in Koperasi Karyawan

a. Savings and Loans takes a long process. The submission process goes through several stages and takes a long time. Deposit and billing information not yet available. Information and reporting is done once during the Annual Member Meeting.

b. Reporting on trades is still manual and offline system. Trade is still very dependent on shopkeepers.

c. Access to information to members is still limited. The goods and services provided by cooperatives are still not widely available to members. So far, it is still through the WA group.
d. Includes policies and procedures that apply. Policies, procedures, goods, and services have not been widely used by members.

The solution to be able to overcome the problems in Tekad Employee Cooperatives is to implement an Koperasi Information System consisting of Savings and Loans, information and financial reporting.

![TOGAF ADM cycle](image)

**Figure 1. TOGAF ADM cycle**

Architecture Vision describes the initial phase of an architecture development cycle. It includes information about defining the scope, identifying the stakeholders. Koperasi TEKAD is growing bigger. This is indicated by the increasing number of members and also the investment and the money in it. The purpose and objective of this cooperative is to work in the field of Savings and Loans, Trade and Services. To achieve these goals and objectives the cooperative carries out business activities including savings and loan, food or snack sales, graduation photo services and toga rental. Four types of general architecture are part of the EA, including Business Architecture, Data Architecture, Applications Architecture, and Technology Architecture. Information Systems architecture is a combination of data architecture and application [3]. Figure 1 illustrates the vision and real principles regarding the development of EA, the principle is used as a benchmark to assess the success of EA development in an organization.
Figure 2. Baseline Business Process Koperasi TEKAD

Figure 3. Proposed Business Processes Koperasi TEKAD
TOGAF also has four types of architecture that can support the overall EA as follows:

1. Business Architecture
   Business Architecture describes the development of a Business Architecture to support an agreedArchitecture Vision. Modeling business processes in business architecture has a purpose, to provide a clear picture of the current state of the organization. The form of business process analysis in cooperatives for operational functions is illustrated by two things, the baseline or current conditions in Figure 2 and the proposed business processes in Figure 3.

2. Data Architecture
   This architecture describes the structure of data assets as well as organizational data management resources logically and physically. The data architecture component provides a structure for detailed documentation of information for organizations. Currently, Koperasi Karyawan TEKAD does not have a data architecture yet, so this stage will be proposed to design a data architecture so that it can be applied to support the business processes. Part of data architecture in this definition is made by identifying prospective class candidates.

3. Application Architecture
   An architecture that provides blueprints for use on individual application systems that are applied. Application architecture is the action that decides the development and application of solutions or services that are being made for the organization. The design for application architecture is a combination of processes that use parts of the overall application and business models, information and technology that can design an expected business application.

4. Technology Architecture
   The architecture needed to help spread business, data and application services to develop software and hardware capabilities. The technology architecture can include IT infrastructure, middleware, networks, communications, processes, and standards. Technology architecture is an approach to explain the structure and relationship of technology companies now and in the future to make the value of technology. Implementation of Governance phase and Change Management phase in this research are not discussed, will be continued in another research.

4. Conclusion
   Based on the discussion, it can be concluded that Koperasi Karyawan TEKAD currently does not have an information system to manage Koperasi operations. So in this study, the authors designed an enterprise architecture so that the systems designed can be integrated, and the design of the enterprise architecture uses the TOGAF ADM framework that starts from Architecture Vision phase to Architecture Technology phase which produces blueprint designs to be able to assist every activity in Koperasi Karyawan TEKAD.

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