Designing Enterprise Architecture for Sports Information System Platform Using the Open Group Architecture Framework Architecture Development Method

I Saepurrahman¹, I D Sumitra ¹,²
¹Department of Magister Information Systems, Universitas Komputer Indonesia
²Department of Information System, Universitas Komputer Indonesia
Email : iip.saepurrahman@gmail.com

Abstract. The purpose of this study to along with the development of information technology PSSI ASPROV JABAR, wants to develop information systems but does not have a corporate blueprint in designing information systems. The method used enterprise architecture design is based on TOGAF ADM literature study. The design of an enterprise architecture information system for sports platforms will be designed using TOGAF ADM, in developing the information system phase, the Architecture Phase Architecture, the Business Architecture Phase, the Information System Architecture, and the Architectural Technology Phase. This research produces a blueprint that will be used to create information systems that can support ongoing business processes. TOGAF ADM is designed as a general framework and has good alignment between business and technology. The conclusion of this research is that the company's architectural design using TOGAF ADM can be used in PSSI ASPROV JABAR according to the documents and processes that are running and can produce a blueprint for creating information systems so that they can support ongoing business processes.

1. Introduction

TOGAF (The Open Group Architecture Framework) is a EA framework for designing, planning, building and managing IT infrastructure organization which provides a details method and set of supporting tools. TOGAF is used by organization to design and implement enterprise architectures which give guarantee of a design and a procurement specification that can facilitate and benefit an open systems implementation with reduced risk. The results of using TOGAF in designing of enterprise architecture, reflecting stakeholder needs is achieved, using best practices, and to consider both current and future business needs [1]. TOGAF is a framework - a detailed method and a set of supporting tools - for developing an enterprise architecture. It may be used freely by any organization wishing to develop an enterprise architecture for use within that organization [2]. TOGAF ADM (Architecture Development Method) The TOGAF ADM is the result of continuous contributions from a large number of architecture practitioners. It describes a method for developing and managing the lifecycle of an enterprise architecture, and forms the core of TOGAF. It integrates elements of TOGAF described in this document as well as other available architectural assets, to meet the business and IT needs of an organization [2]. When developing information systems companies can use TOGAF ADM, but TOGAF has a weakness in the difficulty to use and is quite difficult to learn because it is designed as a generic corporate architecture framework, TOGAF then becomes very large and complex, presenting artifacts that depend on needs so that they do not can be used, and requires adjustments in its use [3]. Enterprise Architecture is a method for harmonizing business strategies and Information Technology strategies [4].

Football, with more than 270 million footballers around the globe, is one of the most popular sports in the world [5]. Football Association of Indonesia (PSSI) born in Yogyakarta on April 19, 1930 as a manifestation of the demands of the national movement to achieve Indonesian independence, therefore the Football Association of Indonesia is one of the Nation and State Struggle Organizations carried out through football [6]. In each province there is a representative namely the Provincial Association (ASPROV) including the province of West Java which has a goal of continuously developing and promoting football,
regulate and monitor it in the entire territory of the Unitary Republic of Indonesia in the spirit of fair play and unite it through education, culture and human values, especially through the development of young players, holding internal competitions in all forms and levels at the national level, by determining right, the area of victory that is recognized in accordance with the objectives of the formation of various soccer leagues, Arranging regulations and provisions regarding the conduct of football and ensuring their enforcement, Protecting the interests of Members, Preventing all violations of the Statute, rules of instruction and decisions issued by FIFA, AFC, AFF and PSSI and Game Rules and ensure that all of these regulations are obeyed by all members, Establish appropriate methods and systems to prevent the intervention of any party that results in the loss of sportsmanship values in soccer. Control and supervise all forms of friendly matches that take place in the territory of Indonesia, Maintain international relations in the field of sports with other Football Associations in all forms and sports activities, Host of competitions at international level and other levels [6]. ASPROV PSSI JABAR has a chair namely Mr. Tommy Aprianto and secretary Mr. Dedy Permana Hidayat, who has a term of office for 5 years [7]. PSSI consists of 34 Provincial Associations (ASPROV) [8] in accordance with the number of provinces in Indonesia.

The aims of this study will be carried out in the ASPROV PSSI JABAR aims to assist in the creation of the company's blueprint architecture to help solve the problem of information flow in existing business processes and as a guide when developing information systems. The design of enterprise architecture information systems for sports platforms will be designed using The Open Group Architecture Framework (TOGAF) Architecture Development Method (ADM), in developing the phase information system that is carried out, namely Phase Vision Architecture, Business Architecture Phase, Information System Architecture and Phase Technology Architecture. This research produces a blueprint that will be used for making information systems that can support ongoing business processes.

2. Method

The method used in enterprise architecture design is based on TOGAF ADM literature study, direct observation and interviews with stakeholders. In the initial stage, it is direct observation, collecting documents in the business process and conducting interviews with my interests. Research conducted at PSSI ASPROV JABAR. Documents obtained from direct observation of each business process and interviews with stakeholders, then problems are obtained, Vision Architecture, Business Architecture, Information System Architecture and Technology Architecture. So that it can be made a blueprint for enterprise architecture by referring to the corporate architecture framework used today. The Basic structure of the TOGAF ADM can be seen in Figure 1.
TOGAF ADM is a result of the continuing contribution of a large number of architectural practitioners. This explains methods for developing and managing the life cycle company’s Architecture and forms the core of TOGAF. It integrates 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].

3. Results and Discussion

Based on observations and interviews indicate that in PSSI ASPORV JABAR there is no blueprint for designing an enterprise information system architecture that will support business processes and still use manual processes that cause information and data not to be conveyed properly. When creating an enterprise architecture blue print, it will use TOGAF ADM. The stages of the enterprise architecture design will refer to the TOGAF ADM stage which consists of Phase Vision Architecture, Business Architecture Phase, Phase Information System Architecture and Phase Technology Architecture [1]. This research that has been done can produce a blueprint as a guideline for creating information systems so that they can support ongoing business processes. The following is a further explanation of each phase of the TOGAF ADM

3.1. Phase Vision Architecture

The purpose of the Phase Architecture Vision is to find out the scope of enterprise architecture design according to the vision and mission of the PSSI ASPROV JABAR. PSSI ASPROV JABAR provides stakeholders and person in charge based on the organizational structure. The method used in enterprise architecture design is based on TOGAF ADM literature study, direct observation and interviews with stakeholders. The design of enterprise architecture is carried out for approximately three months. Along with the development of information technology and the lack of guidance in developing information systems in PSSI ASPROV JABAR, a company blueprint architecture is needed to assist in resolving existing information flow problems and as guidelines when developing information systems. Analyze documents from business processes that are running on PSSI ASPROV JABAR so that you get a system requirement in designing a sports platform information system at PSSI ASPROV JABAR.

3.2. Business Architecture Phase

The Business Architecture Phase aims to ensure that the enterprise architecture design will be made in line with needs based on the vision and mission, work units, and stakeholders in the PSSI ASPROV JABAR (Table 1).

| No | Issues | Architecture Current | Method | Architecture Expected |
|----|--------|----------------------|--------|-----------------------|
| 1  | Still doing business processes using manual documents so that the business process runs takes a long time | The entire business process is still using manual documents | The process of automation with information data based on documents in the business process is running | The business process runs by using an information system |
| 2  | There has not been an alignment between the achievement of vision and mission with information technology architecture | To carry out the process of achieving the vision and mission have not used information technology architecture | Evaluation using information technology architecture | Alignment of vision and mission can utilize information technology architecture that has been tested |
| 3  | The process of collaboration with parties (field, sports shop, payment) is still manual | To collaborate with other parties is still manual | Integrating service | The collaboration process can use information systems |

From Table 1 gap analysis it can be concluded that it is necessary to harmonize the achievement of vision and mission with a vision of technology architecture that will help to run business processes using information systems to avoid long time use.
3.3. Information System Architecture Phase

At this stage it is explained how the information system enterprise architecture will be developed. In the Information System Architecture phase can be seen from two (2) aspects, namely the application architecture and data architecture. The explanation of the two aspects is as follows:

3.3.1. Application Architecture.

Application architecture explains the needs of sports platform information systems in the PSSI ASPROV JABAR which will be designed to run well, on time and online. With the implementation of an online sports platform information system so that it can be accessed anytime and anywhere. Sports platform information system in PSSI ASPROV JABAR needed is a single system that can be managed by each work unit. Stakeholders in the PSSI ASPROV JABAR dynamic and real-time information system in accordance with the need to achieve the vision and mission. Figure 2 illustrates the application architecture offered, namely digital touch points in the form of web and mobile that access applications using the internet and firewalls as network security (Figure 2).

Figure 2. Proposed Application Architecture

3.3.2. Data Architecture.

In the data architecture, stakeholders in PSSI ASPROV JABAR need centralized and integrated data from various work units that aim to improve coordination and synchronization of business processes and information can be delivered on time, accurately and relevant. After integrated data, it is hoped that it can make information that is timely, accurate and relevant (Table 2).

Table 2 GAP Analysis Information System Architecture

| No | Issues                                                                 | Architecture Current | Method                                    | Architecture Expected                      |
|----|------------------------------------------------------------------------|----------------------|-------------------------------------------|-------------------------------------------|
| 1  | There is no information system to support integrated business process needs | All business processes have not used information systems | Creating an integrated information system that can support all business processes. |                                           |
| 2  | All business processes are not yet integrated with the application     | Integration uses manual communication | Service Oriented Architecture (SOA)        | Integrated information system using SOA   |

Table 2 explains the information system gap analysis table it is concluded that the implementation of Service Oriented Architecture (SOA) is needed in the information system integration process that can support business processes.

3.4. Phase Technology Architecture

This phase aims to make modeling hardware, software and computer networks to implement the results of phase information system architecture.

Solutions offered for Technology Architecture for software and software that illustrate that later the JABAR PSSI ASPROV information system can be integrated with other information systems in accordance with business process requirements, and can be seen in Figure 3.
Solution offered for computer network technology architecture that describes that the PSSI ASPROV JABAR information system that will be made is web-based and mobile and has good security to prevent crime and can be seen in Figure 4.
From research that has been done using TOGAF ADM for sports information systems in PSSI ASPROV JABAR can integrate data from each work unit and can be implemented in PSSI CENTER by adjusting existing business processes. TOGAF ADM is designed as a general framework and has good alignment between business and technology. TOGAF can produce various architectural models or facilitate work and facilitate to integrate, adapt to the future in scalability and extensibility [9]. Although the TOGAF method is done for an item but the TOGAF method can be adjusted as a tool for the center [10].

4. Conclusion
Based on the implementation of TOGAF ADM in PSSI ASPROV JABAR, conclusions can be reached namely, the process of designing enterprise architecture using TOGAF ADM can be used in PSSI ASPROV JABAR in accordance with documents and processes that are running and can produce blueprints to create information systems so they can support ongoing business processes, the solutions offered for mobile and web-based sports platform information systems and integration technology platforms for each proposed information system are Service Oriented Architecture (SOA).

Acknowledgement
Alhamdullillah, the author said to Allah SWT who bestowed his mercy and gifts to the author, the author also gave thanks to Irfan Dwiguna Sumitra, Ph.D. who involved the author in this study to assist experts in dealing with moral or moral problems so the author can complete this research.

References
[1] The Open Group: TOGAF Version 9.1 Evaluation Copy, The Open Group. 2011
[2] A Josey and the TO Group 2011 TOGAF® Version Enterprise Edition - An Introduction San Francisco CA
[3] M N Mahrin, F Nikpay, P Nikfard and B D Rouhani 2013 A Comparison of Enterprise Architecture Implementation Methodologies International Conference on Informatics and Creative Multimedia Pp. 1-6
[4] Dede Rusil, Yoanes "Designing an Enterprise Architecture (EA) Based on TOGAF ADM and MIPI ", International Conference on Information Technology Systems and Innovation (ICITSI), 2017
[5] FIFA (2012) 270 million people active in football. http://www.fifa.com/mm/document/affederation/administration/01/28/72/70/hof-ee.pdf
[6] Statuta Persatuan Sepakbola Seluruh Indonesia, 2011
[7] Asosiasi Provinsi Jawa Barat. https://www.pssi.org/about/members/provincials/jawa-barat
[8] Agenda dan Jumlah Voter Kongres PSSI 2019. https://www.pssi.org/news/agenda-dan-jumlah-voter-kongres-pssi-2019
[9] Zenon Chaczko, Christopher chiu, Avtar Singh, Kohli and Venkatesh Mahadevan, “Smart Hospital Management System: An Integration of Enterprise Level Solutions Utilising Open Group Architecture Framework (TOGAF)”, 3rd International Conference on Computer Science and Information Technology2010
[10] Ian Yosef Matheus Edward, Wervyan Shalannanda, Susmini Indriani Lestariningati, Aldo Agusdian. “E-Government Master plan design with TOGAF framework”, 8th International Conference on Telecommunication Systems Services and Applications (TSSA), 2014