

Enterprise Architecture Zachman Framework in Ma'had Sunan Ampel Al'aly

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Abstract- Ma'had Sunan Ampel Al'aly is an educational institution under the auspices of the State Islamic University of Maulana Malik Ibrahim Malang which aims to create an academic culture to improve the religious knowledge of new students at the Maulana Malik Ibrahim State Islamic University of Malang. So far, there is no blueprint at MSAA, so it is necessary to make a blueprint as a guideline for designing the ma'Ahad system design. With the blueprint, ma'had will have system design guidelines. So that when there is a new policy it will be easier to re-plan. To create a blueprint you can use the enterprise architecture framework with the Zachman Framework method. Zachman Framework is one of the best known and used enterprise architecture frameworks. In this study the Zachman Framework was used to design the blueprint in Ma'had Sunan Ampel Al'aly.

Keywords—blueprint; enterprise architecture; Ma'had Sunan Ampel Al'aly; system design; Zachman Framework

I. INTRODUCTION

Ma'had Sunan Ampel Al-Aly is an educational institution under the auspices of the State Islamic University of Maulana Malik Ibrahim Malang which requires students to stay there for 2 semesters. MSAA aims to create academic culture and enhance the religious knowledge of new students at Maulana Malik Ibrahim State Islamic University of Malang.

Ma'had Sunan Ampel Al-Aly is divided into 2 namely: Ma'had Putra and Ma'had Putri. Ma'had Sunan Ampel Al-Aly has many fields that regulate affairs in Ma'had, such as: finance, human resources, facilities, infrastructure, and others. Because of the many fields that exist in Ma'had so there can be a risk of errors in data management. Therefore, the need for support from Information Technology in the form of blueprint is needed.

At present MSAA does not have a blueprint as a guideline for the design of the overall system design for the next few years. Blueprint can be created using the enterprise architecture framework with the Zachman Framework method. Zachman Framework is one of the best known and used enterprise architecture frameworks. The purpose of making a blueprint is so that Ma'had Sunan Ampel Al-Aly can carry out learning activities and achieve organizational goals well. On the basis of the problem presented in the background, the statement of the problem of this study is:

1. How to design a blueprint using the enterprise architecture needed by Ma'had Sunan Ampel Al-Aly?

With the blueprint, it is hoped that the stakeholders of Ma'had Sunan Ampel Al-Aly can carry out their tasks more easily and better and Ma'had Sunan Ampel Al-Aly can be more organized.

II. LITERATURE REVIEW

2.1 Ma'had

Ma'had is a word derived from Arabic which means institute, institution, academy. Ma'had is pesantren which is based on tertiary education. Usually a university under the auspices of the Ministry of Religious Affairs has a ma'had, it can also be interpreted as a boarding school. Islamic boarding school is an Islamic educational institution, where students usually live in dormitories with teaching material of classic books and general books, aiming to master the science of Islam and practice it as a guide to daily life by emphasizing the importance of morals in social life [1].

2.2 Enterprise Architecture

[2]Enterprise Architecture is a management practice to maximize the contribution of company resources, investment and system development activities to achieve its performance goals. To achieve the organization's mission through optimal performance of business processes with the efficiency of the information technology environment, the application of enterprise architecture must be included in the company's roadmap.

According to [3] "Enterprise Architecture: Organizing logic for business processes and IT infrastructure capabilities that reflect the integration and standardization requirements of the company's operating model".

2.3 Zachman Framework

Zachman framework was first introduced by John Zachman[4]. Zachman Framework does not determine where application development activities begin. The use of assumptions can be used to determine control over the scope of the system design. To confirm assumptions validation, organizations can use Zachman rows to cross with Zachman columns to get true drivers, namely: What, How, Where, Who, When and Why[5].

Zachman defines it as follows:

1. The columns in the matrix describe the data, functions, location (where the business is located), the people who should be there and involved in the organization, the time

for events that occur, and motivation determine how the business runs.

2. The rows describe the aspects of the development process, namely: scope, business models, information systems models, technology models, component models, and function systems.
3. Zachman Framework describes the organization architecture in general and describes it as a complex enterprise system. In the business world, organizations are required to make change management. The purpose of change management is related to competitive advantage between the organization and its competitors.
4. Zachman framework provides a basic structure that supports the organization, access, integration, interpretation, development, management and changes in the architectural representation of the organization's information system. Each object or description of an architectural representation is referred to as an artifact.

III. RESEARCH DESIGN AND METHODS

3.1 Research Design

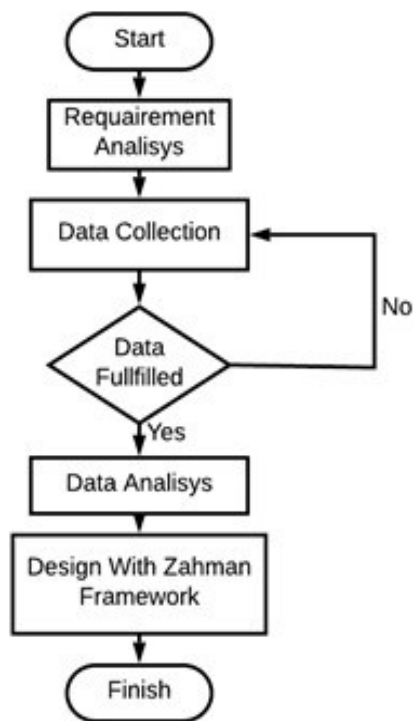


Fig. 1. Research procedure flowchart

The research is carried out through the following four stages:

1. Collecting global information about the condition of Ma'had Sunan Ampel Al-aly.
2. Analyzing the data that has been collected.
3. Conducting a requirements analysis.

4. Designing the system according to the requirements analysis.

3.2 Research Methods

The method used in this study is the Zachman Framework. [2]The Zachman Framework provides a basic structure that supports organizational development and management. Each object or description of the architectural representation is explained as follows:

- a. What column discusses the data available at Ma'had Sunan Ampel Al-aly. The sections to be described are scope and business model.
- b. How column discusses the processes that occur in Ma'had Sunan Ampel Al-aly. The sections to be described are scope, business model, system model, and technology model.
- c. Where column discusses the main business location of Ma'had Sunan Ampel Al-aly. The sections to be described are scope, business model, system model, and technology model.
- d. Who column discusses the human resources that play a role in Ma'had Sunan Ampel Al-aly. The sections to be described are scope, business models, system model.
- e. When column discusses the definition of activities and the allocation of time use for activities carried out by Ma'had Sunan Ampel Al-aly. The sections to be described are scope, business model, system model, and functioning system.
- f. Why column discusses the things that Ma'had Sunan Ampel Al-aly wanted to achieve. In this column, the sections to be described is scope.

IV. RESULTS AND DISCUSSION

The discussion of this research is in the form of a blueprint described in the columns of What, How, Where, Who, When, Why and How as follows:

4.1 WHAT

4.1.1 Scope

This section is a description of the list of important entities that play a role in the academic process at Ma'had Sunan Ampel Al-aly. The description is done textually, Ma'had Sunan Ampel Al-aly has the following business entities:

1. The Head of Ma'had
2. Board of caregivers
3. Academic and student administration staff
4. Linguistic staff
5. Teaching staff
6. Murabi / Murrabiah
7. Mu'alim / Mu'alimah
8. Musrif / Musyrafah
9. Mahasantri

4.1.2 Business Model

Business Model Ma'had Sunan Ampel Al-aly regarding the data needs of entities. The relational explanation of a Business Entity is as follows:

1. The head of ma'had is a mudir who is appointed by the chancellor, who has the task of carrying out Islamic education and guidance through the pesantren education model within the university.
2. Caregivers help carry out the duties of the head of ma'had in leading and coordinating the implementation of academic activities in each mabna (dormitory).
3. Academic and student administration staff serving the head of ma'had, caregivers, ma'had and mahasantri staff.
4. Linguistic staff helps mudir in leading and coordinating the implementation of language activities in Ma'had.
5. The teaching staff helps the mudir in leading and coordinating the mu'alim / mu'alimah who are appointed to teach in Ma'had.
6. Murrabi / Murrabiah helps the board of caregivers in leading and coordinating the activities in each mabna.
7. Mu'alim /, mu'alimah helps the mudir and the board of caregivers in teaching and learning activities in Ma'had.
8. Musyrif / musyrifah helps murrabi / murrabiah in leading and coordinating all activities in each room in mabna.
9. Mahasantri must follow all the rules and activities in Ma'had.

4.2 HOW

4.2.1 Scope

The following are the main processes in academics at Ma'had Sunan Ampel Al-aly:

1. Recruitment of mu'alim /mu'alimah
2. Placement of teaching and learning classes
3. Mahasantri study activities
4. Mahasantri obligation to follow all activities that have been determined

4.2.2 Business Model

This column describes the data needs of entities in the academic process that exist in Ma'had Sunan Ampel Al-aly:

1. The head of ma'had proposes mu'alim / mu'alimah to teach at Ma'had Sunan Ampel Al-aly.
2. Mu'alim / mu'alimah is determined to teach in accordance with the level of expertise in Al-Qur'an and traditional books that teach Islam.
3. Mahasantri perform learning process in accordance with the class that has been determined by going through the test reading Al-Qur'an and traditional books.
4. Mahasantri is required to carry out the learning process in Ma'had for 2 semesters in the first year.

4.2.3 System Model

The following is an overview of the activities carried out in the teaching and learning process at Ma'had Sunan Ampel Al-aly.

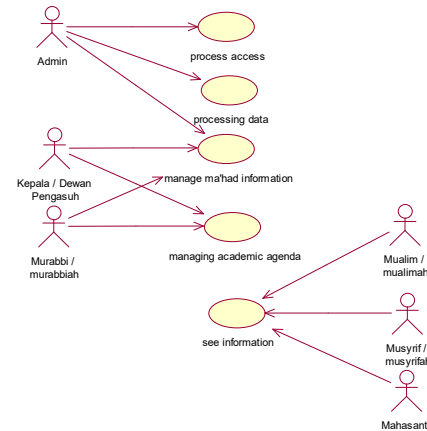


Fig. 2. Use case diagram of content management system Ma'had Sunan Ampel Al-aly

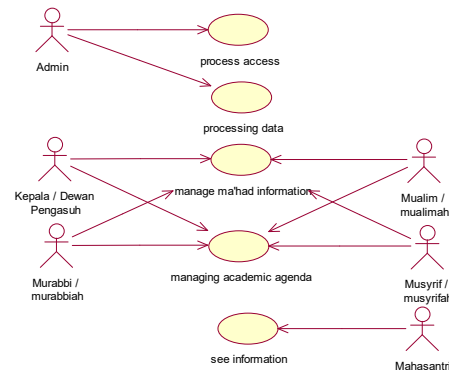


Fig. 3. Use case diagram of academic information system Ma'had Sunan Ampel Al-aly

4.2.4 Teknologi Model

Describing how the system works, such as for the interface of a content management system and academic information system at Ma'had Sunan Ampel Al-aly.



Fig. 4. Interface of the Ma'had Sunan Ampel Al-aly content management system

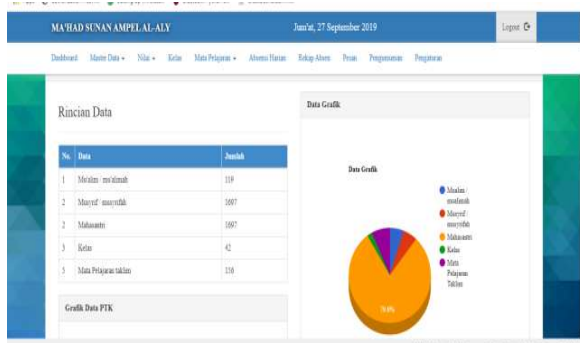


Fig. 5. Design of Academic Information System Ma'had Sunan Ampel Al-aly

Ma'had Sunan Ampel Al-aly.

a. Boys Dormitory



Fig. 6. Map of boys dormitory

Figure 6 description :

1. Mabna Al-Farabi
2. Mabna Ibn Khaldun
3. New mabna (doesn't have a name yet)
4. Canteen
5. Mabna Ibn Sina
6. Mabna Ibn Rusdy
7. Mabna Al-Ghazali
8. Field
9. Mabna Al-Ghazali
10. At-Tarbiyah Mosque
11. Security Office
12. Ma'had Headquarters
13. Caregiver House

b. Girls Dormitory



Figure 7. Map of girls dormitory

Figure 7 description :

1. Mabna Ummu Salama
2. Mabna Asma' Binti Abi Bakar
3. Caregiver House
4. Mabna Khadijah Al-Kubro
5. Mabna Fatimah Az-Zahro
6. Ulul Albab Mosque

c. Floor plan of Ma'had Headquarters

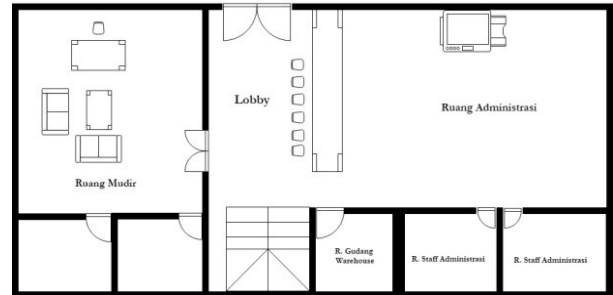


Fig. 8. Floor plan of the first floor of the ma'had headquarters

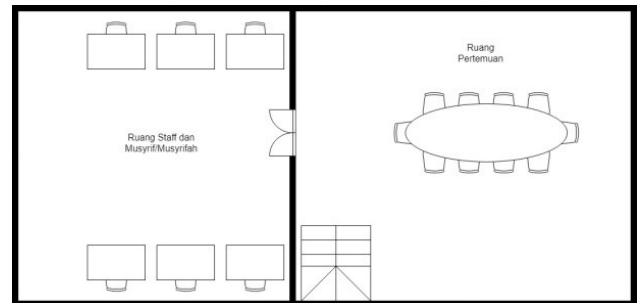


Fig. 9. Floor plan of the second floor of the ma'had headquarters

4.2.5 Business Model

This section describes the location of Ma'had Sunan Ampel Al-aly. Ma'had Sunan Ampel Al-aly is in the neighborhood of Maulana Malik Ibrahim State Islamic University Malang at Gajayana Street Number 50, Dinoyo, Lowokwaru, Malang City, East Java 65144.

4.2.6 System Model

In the system model section explains the local network topology that is in Ma'had Sunan Ampel Al-aly. Ma'had's local network is connected by using a router that gets access from the Faculty of Science and Technology of the State Islamic University of Maulana Malik Ibrahim Malang then in Ma'had is connected again to the wifi network on each floor.

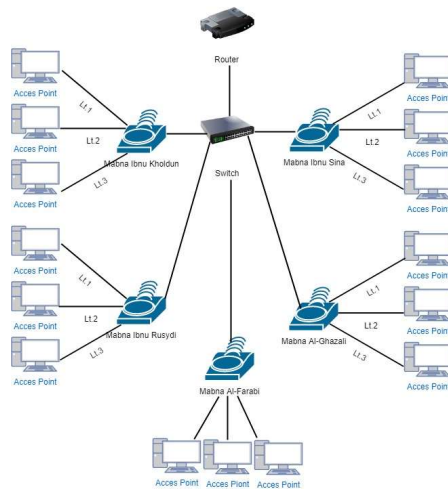


Fig. 10. Local network of boys dormitory

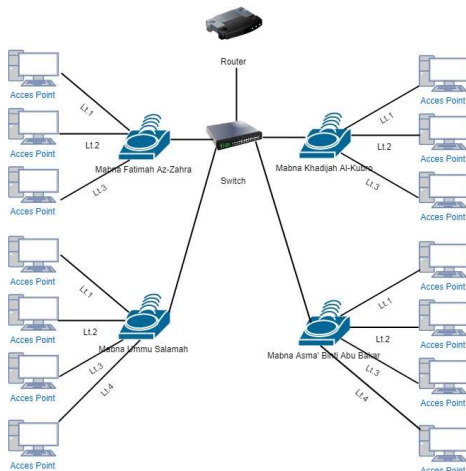


Fig. 11. Local network of girls dormitory

4.2.7 Technology Model

This section illustrates the internet network scenario at Ma'had Sunan Ampel Al-aly. Network at ma'had is directly connected to the university by going through the network from the university's communication center then to the faculty of science and technology then to ma'had and all university or ma'had data is accommodated to the server.

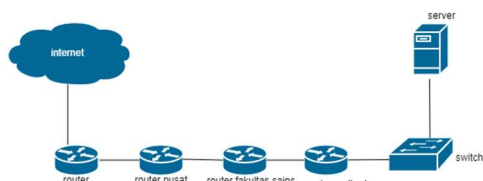


Fig. 12. Internet Network at Ma'had Sunan Ampel Al-Aly

4.3 WHO

4.4.1 Scope

The following is a list of organizational units that play an important role in the academic process at Ma'had Sunan Ampel Al-aly.

1. Chancellor
2. The head of the ma'had
3. Caregivers
4. PPK (the official in charge of making commitments)
5. Treasurer
6. Planning staff
7. Housekeeping staff
8. Academic and students staff
9. Administrative staff
10. Linguistic staff
11. Teaching staff
12. Maintenance staff
13. Technician staff
14. Murabi / Murrabiah
15. Mu'alim / Mu'alimah
16. Musyrifah / Musyrifah
17. Mahasantri

4.4.2 System Model

The system model is described in the organizational structure of Ma'had Sunan Ampel Al-aly

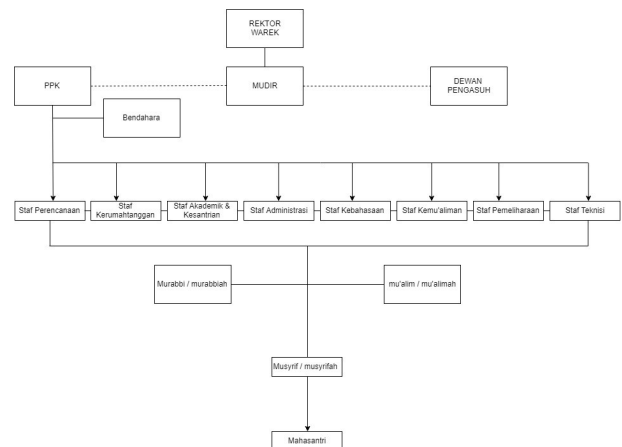


Fig. 13. The organizational structure of Ma'had Sunan Ampel Al-aly

4.4.3 Business Model

An explanation of the organization of each entity that is in the description of the organizational structure in Ma'had Sunan Ampel Al-aly.

1. The head of ma'had is the mudir who is appointed by the chancellor, under the authority and is responsible to the vice-chancellor.
2. Mudir as the head of ma'had has the task of carrying out education and fostering Islamic understanding through pesantren education within the university.
3. In carrying out duties in ma'had mudir assisted by a board of caregivers whose job is to become head of the Teaching,

Linguistic, Security, Student Affairs, Religious and Housekeeping.

4. The treasurer serves ma'had finance.
5. Each staff member has a head of their respective fields and helps mudir in carrying out tasks in accordance with their fields.
6. Murabbi / murabbiah are under the care of the caregiver who has the task of supervising and educating the mahasantri in ma'had which is assisted by the musyrif / musyrifah.
7. Mahasantri is required to participate in all types of activities in ma'had for 2 semesters.

4.5 WHEN

4.5.1 Scope

Discussing the academic process in Ma'had Sunan Ampel Al-aly:

1. Promotion of Ma'had Sunan Ampel Al-aly.
2. Teacher recruitment (mu'alimin / mu'alimah)
3. Murrabi / murrabbiah recruitment
4. Recruitment of musyrif / musyrifah
5. Acceptance of new students
6. The learning process
7. Mu'adaah (farewell ceremony)

4.5.2 Business Model

Discussing the details of the major event (scope) of the academic process in Ma'Ahad Sunan Ampel Al-Aly.

1. Ma'had promotion is carried out by the university. Automatically students who are accepted at Maulana Malik Ibrahim State Islamic University Malang must stay in ma'had for 1 year.
2. The recruitment of mu'alim / mu'alimah is done by the head of ma'had.
3. Recruitment of murabbi / murabbiah is done by the head of ma'had and assisted by a board of caregivers.
4. Recruitment of musyrif / musyrifah is done by the head of ma'had and assisted by a board of caregivers.
5. Admissions of new students are accepted by the university, because students who are accepted at Maulana Malik Ibrahim State Islamic University Malang are required to stay in ma'had for one year.
6. Teaching and learning activities carried out by all entities that play a role in Ma'had Sunan Ampel Al-aly.
7. Mu'adaah (farewell ceremony) activities are carried out by all entities that play a role in ma'had sunan ampel al-aly.

4.5.3 System Model

Describing the arrangement of time based on a specific time period for each academic activity.

1. University promotion is carried out approximately 6 months before the registration period.
2. Mu'alim / mu'alimah recruitment is done at the beginning of the academic year when the student will stay at ma'had.
3. Recruitment of murabbi / murabbiah is done during the second semester when the student is still living at ma'had because prospective applicants for murabbi / murabbiah are

intended for UIN Malang students who have completed at least undergraduate education.

4. Recruitment of musyrif / musyrifah is carried out during the second semester when mahasantri still live in ma'had because prospective musyrif / musyrifah applicants are intended for UIN Malang students who are still active at least 3 semesters.
5. For the admission time of university students is determined by the University (around April to July).
6. Teaching and learning activities carried out for one year (two semesters) each period.
7. Mu'adaah (farewell ceremony) activities are held once a year each student will leave Ma'had.

4.5.4 Functioning system

The overall academic process in the academic calendar.

TABLE I
Ma'had Sunan Ampel Al-Aly Academic Calendar Table

No.	Date	Activities
1	August 5, 2019	Ma'had Validation
2	Agustus 11, 2019	Ta'aruf Ma'had
3	August 22-29 2019	Written test and oral test for ma'had placement
4	September 3, 2019	The beginning of the learning process in ma'had
5	September 14-15 2019	Hajj ritual simulation
6	September 21, 2019	Hajj rituals
7	September 26, 2019	The activity of khatm al-quran
8	October 14-17 2019	Ma'had 1st semester midterm exams
9	October 19-20 2019	Islamic Students Day Fair
10	October 22, 2019	Reflection Symposium on Islamic Students Day
11	October 31, 2019	The activity of khatm al-quran
12	November 28, 2019	The activity of khatm al-quran
13	November 29, 2019	Guidance and monitoring of the Mahasantri Qur'an learning process
14	November 30 – December 3, 2019	Ma'had 1st semester final exam

4.6 WHY

4.6.1 Scope

Ma'had Sunan Ampel Al-Aly is united in the same vision, mission and goals stated in the bylaws statement. Following is Ma'had Sunan Ampel Al-Aly's vision, mission and objectives outlined in the scope.

1. Vision

Has aqidah, knowledge, good deeds and akhlaqul karimah

2. Mission

- Delivering mahasantri to have the strength of aqidah, spiritual depth, nobleness of morality and the power of science.
- Organizing al-Qur'an learning and study of the book of Salaf.
- Provide Arabic and English language skills.
- Carry out integrated tutoring between Ma'had and University activities..

3. Goals

- Generating mahasantri with good personality who have the strength of aqidah, spiritual depth, nobleness of morality and extensive knowledge.
- Improve the quality of reading the Qur'an and deepening the book of Salaf.
- Create bi'ah lughawiyah which is conducive to the development of Arabic and English languages.
- Generating students who have advantages in scientific integrity.

V. CONCLUSIONS

Based on the results of architectural modeling Blueprint using the Zachman framework, some conclusions can be drawn as follows:

1. Based on the results of the Ma'had Sunan Ampel Al-Aly Blueprint Architecture Enterprise with the Zachman Framework method, this helps organizations in having a well-integrated system design guide.
2. A mahad blueprint has been produced from the Arsiterture Enterprise framework using the Zachman Framework. Blueprint Mahad is used as a guideline for the design of the overall system design for the next few years.
3. Zachman Framework is used to model an enterprise architecture that describes each step of the process more easily understood and the things to be made are written explicitly.

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