

## INFORMATION SYSTEM ARCHITECTURE DESIGN USING TOGAF ADM AT THE BIN DAHLAN FOUNDATION PRIVATE ISLAMIC SENIOR HIGH SCHOOL

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### ABSTRACT

Strategic information systems planning plays a crucial role in ensuring alignment between organizational needs and the information technology support implemented. This study aims to design a strategic information systems plan for the Bin Dahlan Benteng Foundation Private Islamic Senior High School (MAS) using the Open Group Architecture Framework – Architecture Development Method (TOGAF ADM) framework. This method is used to analyze existing conditions, design the target architecture, and develop a targeted and efficient information systems implementation roadmap. The results indicate that the application of TOGAF ADM can help the institution identify gaps between the current system and the institution's strategic needs and produce development recommendations in the form of a structured medium-term IT architecture roadmap. With this strategic planning, it is hoped that the academic and administrative management processes at the Bin Dahlan Benteng Foundation MAS can be more effective, efficient, and integrated, and support the continuous improvement of the quality of educational services.

*Keywords: Strategic planning, information systems, TOGAF ADM, enterprise architecture.*

### 1 INTRODUCTION

The development of information technology over the past few decades has brought about significant changes in the way educational institutions manage their various activities. Information systems are no longer merely complementary but have become a crucial component in supporting administrative efficiency, increasing data transparency, and improving the overall quality of educational services [1]. With an integrated system, information management processes can be carried out more quickly, accurately, and easily accessed by those who need them.

However, considering the conditions at the Bin Dahlan Foundation Madrasah Aliyah, the use of information technology is still not optimal. Many important processes, such as student data processing, academic data management, and communication between the school and parents, are still carried out manually. This situation not only slows down processes but also has the potential to cause various problems such as delays in information delivery, data inconsistencies, and low levels of data accuracy, which are crucial for decision-making [2]. In the long term, this situation can hamper the effective management of educational institutions.

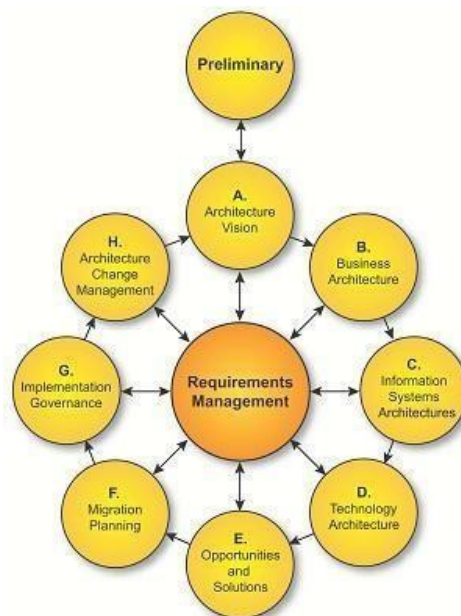
These issues demonstrate the need for strategic planning of information systems that are more focused, structured, and aligned with the needs and goals of the institution. One approach that can be used is TOGAF ADM (The Open Group Architecture Framework Architecture Development Method), a framework used to systematically and comprehensively design and develop information system architectures [3]. Through this approach, every critical aspect, such as business needs, data management, application design, and technology infrastructure, can be analyzed and designed in an integrated manner.

By using TOGAF ADM, organizations can ensure that the information systems they build are truly aligned with the institution's vision and mission and are able to meet existing operational needs [4]. This approach also helps create a more consistent, focused, and sustainable system in the long term.

Based on these conditions, this study aims to formulate a strategic plan for information systems at the Bin Dahlan Foundation using the TOGAF ADM method. The results are expected to produce an information system architecture design that can support administrative activities and the learning process more effectively and efficiently. Furthermore, this research is also expected to provide tangible benefits to schools by improving service quality, facilitating educators in managing information, and providing students and parents with faster, more accurate, and more transparent access to information.

## 2 RESEARCH METHOD

This study used a qualitative approach with descriptive methods. This approach was used to gain an in-depth understanding of the actual conditions of information system utilization at the Bin Dahlan Foundation Private Islamic Senior High School [5]. Data collection techniques were conducted through direct interviews with school officials, including the principal, school operators, and teachers as the main stakeholders, as well as observation. This study also included an analysis of administrative processes and operational activities such as new student admissions, learning processes, and school information archive management [6]. In addition, this research also included a literature review of journals and references related to strategic information systems planning and enterprise architecture implementation using TOGAF ADM [7]. The data obtained was then analyzed qualitatively by identifying system requirements, mapping business processes, and developing business, information, and technology architecture models according to the stages in the TOGAF ADM framework [8].



**Fig 1 Steps of TOGAF ADM**

The method used in this research is the Open Group Architecture Framework Architecture Development Method (TOGAF ADM), a framework used to systematically design, develop, and manage enterprise architecture. Figure 1 shows that the TOGAF ADM process consists of several interconnected stages, starting with the Preliminary Phase, which defines the scope, principles, and stakeholder identification in architecture development.

Next, in the Architecture Vision phase, the vision and primary objectives of the architecture are formulated, which the organization hopes to achieve through the implementation of information systems. The Business Architecture phase is used to analyze existing business processes to identify needs and opportunities for improvement. The Information System Architecture phase then focuses on designing the data and application architecture that supports key business processes. The Technology Architecture phase then determines the

necessary technology infrastructure, such as networks, hardware, and software, that support the information system. The Opportunities and Solutions phase identifies alternative solutions and implementation opportunities, while Migration Planning outlines the development steps from the existing system to the target architecture in stages. The next phase, Implementation Governance, ensures that system development is carried out in accordance with the established strategic plan, and Architecture Change Management is responsible for monitoring and updating the architecture to ensure it remains relevant to changing organizational needs. All of these phases fall within the Requirements Management cycle, which maintains consistency between each phase and the organization's business needs and strategic objectives.

### 3 RESULT AND DISCUSSION

This section discusses the results of the analysis and design of the information system at the Bin Dahlan Foundation Private Islamic Senior High School using the TOGAF ADM framework. The discussion is conducted in stages based on the phases in TOGAF ADM, starting from establishing the design basis to preparing an implementation plan and change management. Each phase provides interrelated contributions in building a complete and sustainable information system architecture design. Therefore, the following description is systematically arranged to demonstrate the alignment between organizational needs, proposed technology solutions, and implementation steps that can be applied by the school.

#### 3.1 Preliminary Phase

The Preliminary Phase is the initial stage in architectural planning that aims to prepare the framework, methodology, and management support before the system is designed. In this study, the TOGAF ADM framework was used because it is able to provide a systematic and comprehensive information system architecture development flow. At this stage, it was also determined that the scope of system development was focused on three main activities at MAS Yayasan Bin Dahlan: New Student Admission (PPDB), the Teaching and Learning Process (PBM), and Alumni Release.

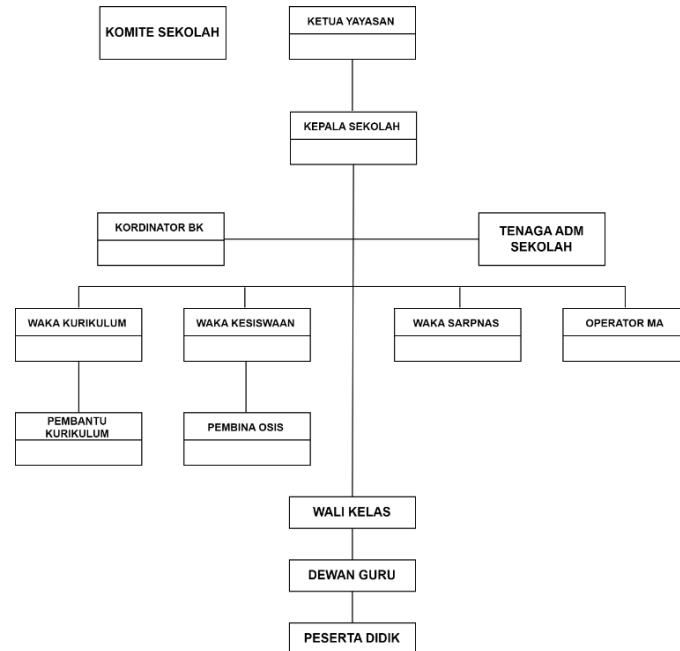
In addition, various architectural tools were determined, such as organizational structure analysis, business process mapping, and data collection through interviews. Equally important in this stage is the commitment from management. Although support has been given verbally, this commitment needs to be stated in the form of a written policy so that the system implementation can run sustainably.

#### 3.2 Phase A Architecture Vision

In this architecture phase, management needs are defined and represented in various important organizational elements, such as the vision and mission, organizational goals, scope, and organizational structure. Furthermore, this stage also identifies stakeholders and describes the current state of the system. This process aims to provide a comprehensive overview of the direction of system development to align with organizational needs and strategies.

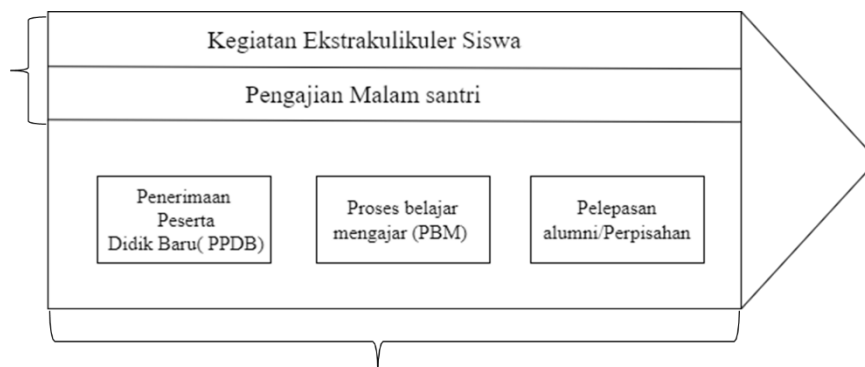
The vision of the Bin Dahlan Foundation Madrasah Aliyah is "Excellent, innovative, and insightful in science and technology, based on IMTAQ (Integrated Principles of Islamic Principles and Principles). This vision serves as the primary foundation for developing an information system that is expected to optimally support the achievement of school goals. Based on this vision, the developed information system is expected to improve administrative efficiency, strengthen data transparency, and support more effective communication between teachers, students, and parents. Thus, the system will function not only as an operational tool but also as a strategic tool for improving the quality of educational services.

This phase also identifies stakeholders involved in the system, including the principal, teachers, operators, school committees, and other interested parties. This identification is crucial for understanding the needs, roles, and contributions of each party in system development and implementation. In addition, the relationships between stakeholders and their roles in the system are depicted visually, as shown in Figure 2, making it easier to understand the flow of interactions and responsibilities of each party.



**Fig 2. Organizational Structure of the PP Bin Dahlan Foundation**

Activity groups are analyzed using the value chain to distinguish primary and supporting processes within the school.



**Fig 3. Value Chain MAS Bin Dahlan Foundation**

At MAS Yayasan Bin Dahlan, the results of the organizational activity identification are categorized into two main phases, as illustrated in Figure 3: the primary activity phase and the secondary activity phase. This classification is conducted to map all school activities according to their level of contribution to the core educational process.

The primary activity phase comprises activities that are directly related to the school's main educational functions. In contrast, the secondary activity phase includes supporting activities that facilitate the smooth implementation and development of the primary processes.

The primary phase consists of three key activities: New Student Admission (PPDB), the teaching and learning process, and alumni farewell activities. These three components form the core of academic operations at MAS Yayasan Bin Dahlan, as they represent the full educational cycle of students from enrollment to graduation.

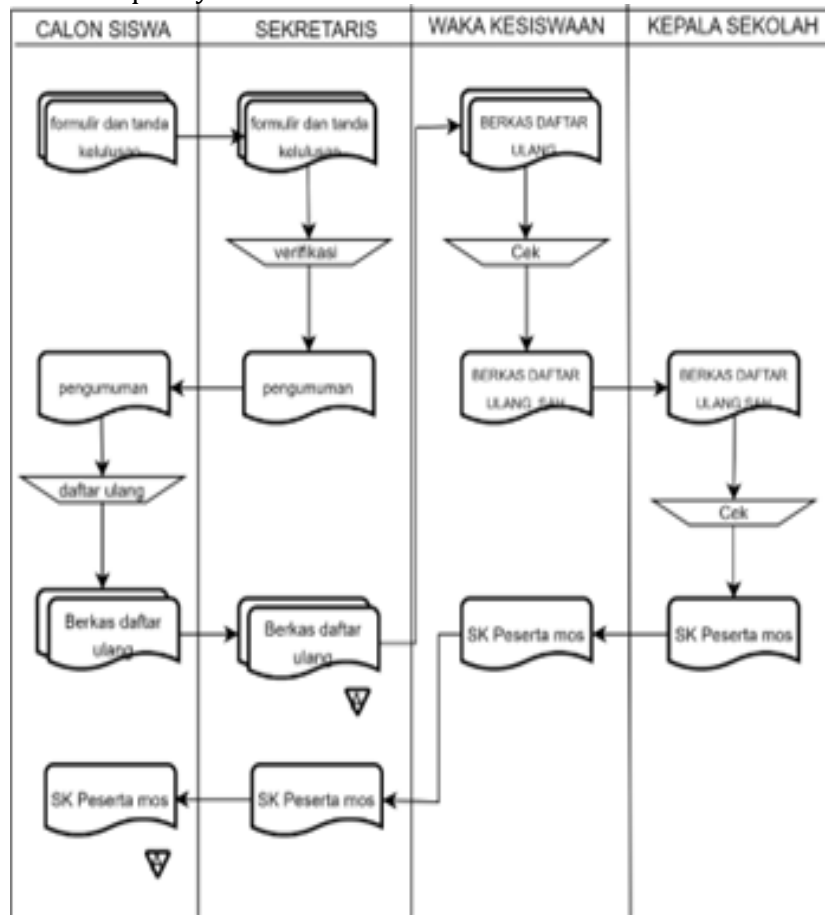
Meanwhile, the secondary activity phase includes extracurricular programs and evening religious study groups. These activities support the development of students' character, skills, and spirituality, thereby contributing to the achievement of holistic educational objectives.

### 3.3 Phase B Business Architecture

This phase will discuss the current state of business process activities at MAS Yayasan Bin Dahlan, and propose business process improvements through business architecture modeling in the form of a flowchart or information system flowchart. This modeling aims to provide a

clearer picture of the current process flow and serve as a basis for designing a more effective and efficient system in the future.

Currently, the New Student Admissions (PPDB) process at MAS Yayasan Bin Dahlan is still conducted conventionally. This process is not supported by a computerized information system, so all stages, from registration to processing prospective student data, are still carried out manually. This situation is considered inefficient because it can slow down the administrative process, increase the risk of data recording errors, and complicate the management and storage of information. If this situation continues, it could hinder the development and improvement of the institution's service quality in the future.



**Fig 4. Current PPDB System Flowchart**

In Figure 4, students who wish to register themselves at MAS Yayasan Bin Dahlan first bring a form and a graduation certificate, which are submitted to the school secretary for later verification in order to obtain graduation information, after the prospective student is declared to have passed, the prospective student brings a re-registration file in the form of a certificate and a passport photo which is then submitted back to the secretary who will then send the file to the student affairs vice principal to be checked whether it is appropriate or not if it is appropriate then the results of the file are submitted to the principal to obtain a student registration certificate, after all files are declared appropriate then the prospective student will receive a student registration certificate.

The recommended improvement proposal is to change the manual service system to a computerized system at MAS Yayasan Bin Dahlan Benteng, This change will enable the implementation of an online new student registration system, online new student registration. This change will improve the efficiency, accuracy, accessibility, and quality of service at MAS Yayasan Bin Dahlan as a whole.

### 3.4 Phase C Information System Architecture

In the Information System Architecture phase, several aspects of an enterprise will be outlined, including the depiction of data architecture, applications, and proposed applications and their mapping for each business function in the school's administrative staff sector.

**Table 1. Process Application Proposal**

Entity	Main Data	Function
New Student Registration	Prospective student identity	Initial system input
File Verification	Documents & Eligibility	Validation
Re-registration	Administrative Data	Finalization of student status

### 3.5 Phase D Technology Architecture

At this stage, the technology architecture functions to identify the current technology platforms and make proposals for the use of technology platforms for applications in the PPDB MAS field of the Bin Dahlan Foundation.

**Table 2. Technolofy Architecture**

Utilization of Information Technology	Description
Data Processing	Using office applications, most data is in hardcopy form, and only a small amount is in softcopy.
Operating System	Windows 11
Printing Tools	Printer Epson L5190

### 3.6 Phase E Opportunities and Solutions

Activities in the field of school PPDB personnel have not utilized or implemented a computer-based information system. The analysis results show that all proposed information systems are not found in the current system. The information system gap reflects the current situation and the proposed information system.

**Table 3. Information System Gap**

Current	Main Data
There is no PPDB information system	PPDB application

### 3.7 Phase F Migration Planning

Determining application implementation priorities: Prioritizing application architecture implementation is based on the organization's needs, ensuring that application implementation is prioritized. From an organizational perspective, this will improve organizational performance.

**Table 4. Application Proposal**

Current	Description
Website of MAS Bin Dahlan Foundation	The Bindahlan Foundation's PPDB website facilitates online registration for new students with comprehensive information, a fast process, and an easy-to-use interface.

### 3.8 Phase G Implementation Governance

In this phase, implementation governance aims to develop recommendations for implementing the previously proposed application systems and technologies. Information technology (IT) management regulates all processes of planning, implementation, operation, security, service continuity, and evaluation of the use of information and communication technology. Two aspects of IT governance are considered: Organizational Governance, School

Administration, and Organizational Governance. This includes defining the vision and mission, organizational activities, and managing information and communication technology.

Information Technology Governance: The process of managing information and communication technology in the School Administration requires a dedicated department. To date, based on direct observation, there is no dedicated department for information and communication technology, which is intended to maximize the management of information technology.

### 3.9 Phase H Architecture Change Management

This section presents the research results. The results may be supplemented with tables, graphs (pictures), and/or charts to clarify the data presentation. The discussion section outlines the data processing results, logically interprets the findings, and links them to relevant sources.

**Table 5. Architectural Change Management**

Aspects	Forms of Change
Human Resources	System Usage Training
Organization	Digital Work Culture Adaptation
Technology	System Maintenance and Updates

## 4 CONCLUSION

Strategic planning of an information system using the TOGAF ADM framework has provided tangible benefits for the Bin Dahlan Foundation Private Islamic Senior High School in improving the quality of governance and educational services. The implementation of a web-based PPDB system enables a faster, more efficient, and more transparent new student registration process, minimizing recording errors and reducing the risk of data loss. Furthermore, data integration within a centralized database simplifies the process of managing, searching, and presenting the information needed by the school in a more accurate and structured manner.

From a management perspective, this information system architecture design helps the school determine a more focused direction for system development that aligns with the institution's vision and needs. Meanwhile, for teachers and administrative staff, this system facilitates faster and more efficient data processing and report preparation. For students and parents, the integrated information system allows for easier, faster, and more accurate access to information. Thus, the results of this planning not only impact the school's operational effectiveness but also support the creation of more modern, adaptive, and sustainable educational services..

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