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# Enterprise Architecture Planning for the Transformation of Career Development Center (CDC) Business Processes at Ma'soem University

Muhammad Fahmi Nugraha[1*], Rifdah Naasyiah[2], Doni Rizki Maulana[3]

[1,2,3]*System Information, Ma'soem University, Sumedang, Indonesia*

**Corresponding author email: famino22@gmail.com*

**Abstract**

The Career Development Center (CDC) at Ma'soem University supports students and alumni in preparing for the workforce through services such as counseling, psychological testing, tracer studies, and job vacancy information. However, the absence of an integrated system makes these services less efficient and difficult to manage. This study proposes a centralized information system using the Enterprise Architecture Planning (EAP) approach to support the CDC's digital transformation. The design includes data, application, and technology architectures aimed at improving service delivery and operational performance. The system development process involves observation, interviews, business process modeling (BPMN), and data structure design (ERD). The result is a system design with key modules supported by secure technological infrastructure. The system is planned to be implemented in stages and is expected to help the CDC operate more effectively and align with the needs of the industrial sector.

*Keywords:* CDC, Digital Transformation, Enterprise Architecture, Information System

## 1. Introduction

In today's digital era, higher education institutions are not only required to provide academic instruction but also to equip their students with strong career skills. The Career Development Center (CDC) is a unit established within universities to enhance the career readiness of students and alumni by offering job vacancy information, counseling, training, and industry engagement. The CDC plays a crucial role in improving access to information and building relationships with the industry (Orobor & Ahuruezenna, 2024).

The Career Development Center (CDC) at Ma'soem University serves as a strategic unit to address this challenge. It functions as a career development service center that helps students explore their potential, understand the work environment, and build connections with industry through various training and mentoring programs. The services offered by the CDC at Ma'soem University are diverse, ranging from psychological testing, individual and group counseling, advocacy, to career development initiatives such as career education, career consulting, job search training, industrial visits, job fairs, and tracer studies. In addition, the CDC also provides information on internships and job openings, as well as soft skill training, CV creation, and interview simulations. Partnerships with industry are a critical component to support graduates in securing relevant job opportunities.

However, with increasingly complex services and a growing need for data integration and operational efficiency, the CDC at Ma'soem University requires a more structured and strategic system planning approach. One possible approach to achieve this is Enterprise Architecture (EA). Enterprise Architecture is a framework for technology management and planning that integrates technological resources, information flow, business processes, and strategic guidelines to provide a holistic view of current developments (Guntara, et al., 2020)

The aim of this study is to design an Enterprise Architecture plan for the CDC at Ma'soem University as an initial step in transforming its business processes. By applying the EA approach, the CDC is expected to enhance service effectiveness, facilitate system integration, and provide a technological foundation that supports accurate and measurable decision-making.

## 2. Materials and Methods

The method used in this research is Enterprise Architecture Planning (EAP). EAP is a data quality planning

approach that is business-oriented and consists of data, application, and technology architecture, along with the implementation process of the architecture itself. This method helps organizations achieve their business objectives (Nugraha, et al., 2023). The stages in the EAP method include: planning initiation, business process modeling, identification of existing technology, design of data architecture, application architecture, technology architecture, and implementation planning (blueprint) (Fauzi, et al., 2022). The steps carried out in this research are as follows:

a. Observation and interviews with CDC personnel to collect data related to workflows, services, and systems currently in use.
b. Identification of system requirements based on the analysis of existing business processes.
c. Enterprise Architecture modeling using the EAP approach, which includes data architecture, application architecture, technology architecture, and implementation planning.
d. Implementation planning (blueprint).

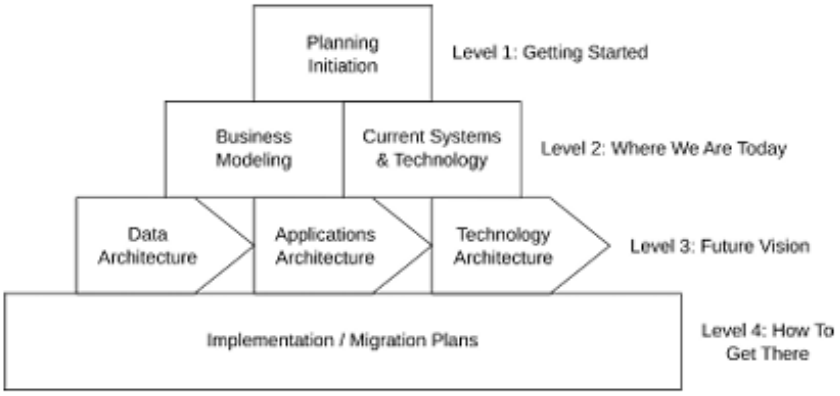


**Figure 1:** EAP Stages

Data collection was conducted directly through semi-structured interviews with the head of the CDC and staff involved in service operations. Field observations were carried out to gain a real-world understanding of the workflow processes. Supporting tools used in system modeling included Business Process Modeling Notation (BPMN) and a context diagram to describe data flows and involved actors. The results were evaluated by comparing the existing conditions with the proposed architectural design to assess potential improvements and service efficiency.

## 3. Result and Discussion

### 3.1. Planning Initiation

a. This stage includes defining the scope and objectives of the Enterprise Architecture Planning (EAP) at the Career Development Center (CDC) of Ma'soem University. The primary focus is on CDC's core activities, such as counseling, psychological testing, providing job/internship vacancy information, and collaboration with industry.
b. The CDC's vision and mission as a career service center are emphasized in the architectural planning to ensure alignment with the strategic goals of Ma'soem University.
c. The defined scope involves the digitalization of career development services, which are currently conducted manually or are not yet fully integrated.

### 3.2. Business Modeling

Business modeling aims to define the business activities within an organization and describe the key functions carried out. These functions can then be broken down into a number of sub-functions according to the organization's activities.

a. Business Process Identification

The business processes at CDC are designed based on the value chain concept and are illustrated using Business Process Model and Notation (BPMN) to depict the relationships between activities. Core activities such as counseling services, psychological testing, and job vacancy information fall under primary activities, while data management and tracer studies serve as supporting activities.

- Value Chain
  The value chain concept applied at CDC aims to identify points where value can be added throughout the service delivery process. By mapping each activity in a structured way, the organization can evaluate the effectiveness and efficiency of each business function and continuously improve its operations.

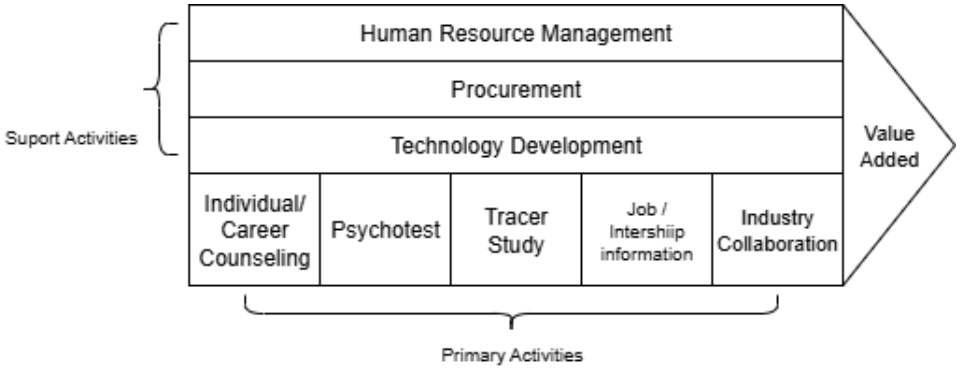


**Figure 2:** Value Chain of CDC Ma'soem University

b. Business Process Model and Notation (BPMN)
After identifying the activities through the value chain, the next step is to develop a more detailed service flow model using Business Process Model and Notation (BPMN). BPMN modeling is used to represent the sequence of activities (Fanani & Setiawan, 2022). The following is the BPMN diagram for core activities at CDC Ma'soem University:

- BPMN for Individual/Career Counseling
  After the counseling session ends, the student proceeds based on the counselor's guidance. If necessary, they attend follow-up sessions; otherwise, they act independently on the counselor's recommendations, such as attending training or searching for job vacancies. This process marks the end of the individual counseling service.

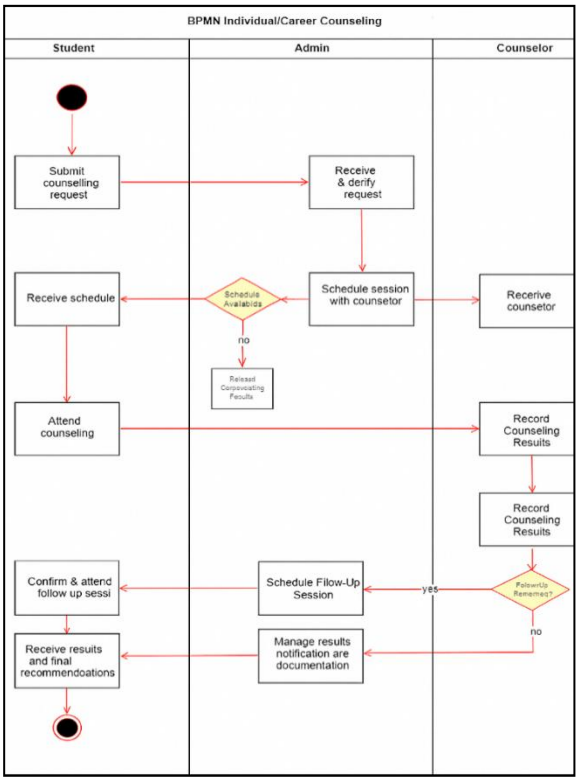


**Figure 3:** BPMN for Individual/Career Counseling

- BPMN for Psychological Testing (Psikotest)
  Psychological testing is one of the CDC's services aimed at assessing students' potential, interests, and personality traits as a foundation for career decision-making. The psychotest process follows a specific

workflow to ensure structured and effective execution.

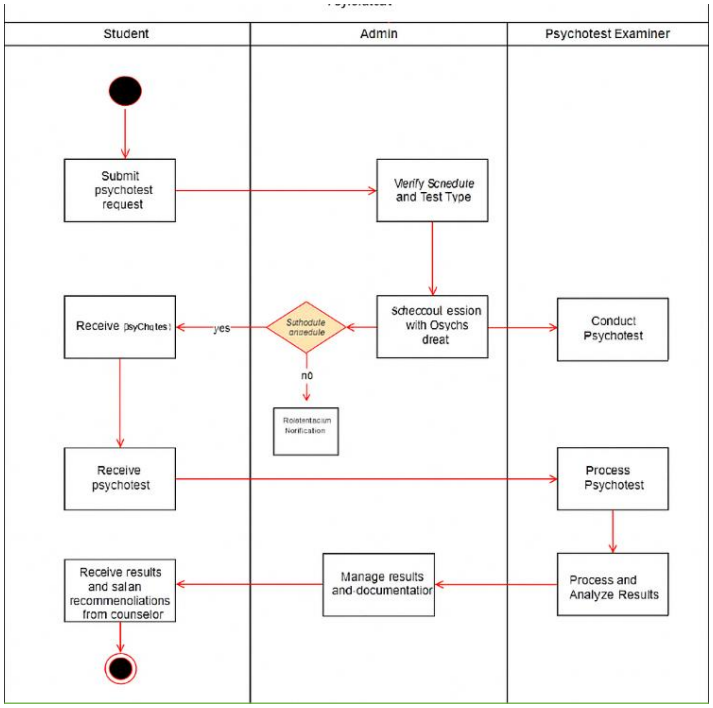


**Figure 4:** BPMN for Psychological Testing

- BPMN for Tracer Study
  The tracer study is a process of tracking alumni, conducted to collect data on employment situations, the relevance of competencies, and feedback on the campus learning experience. This process is carried out systematically to support the evaluation and improvement of educational and career services.

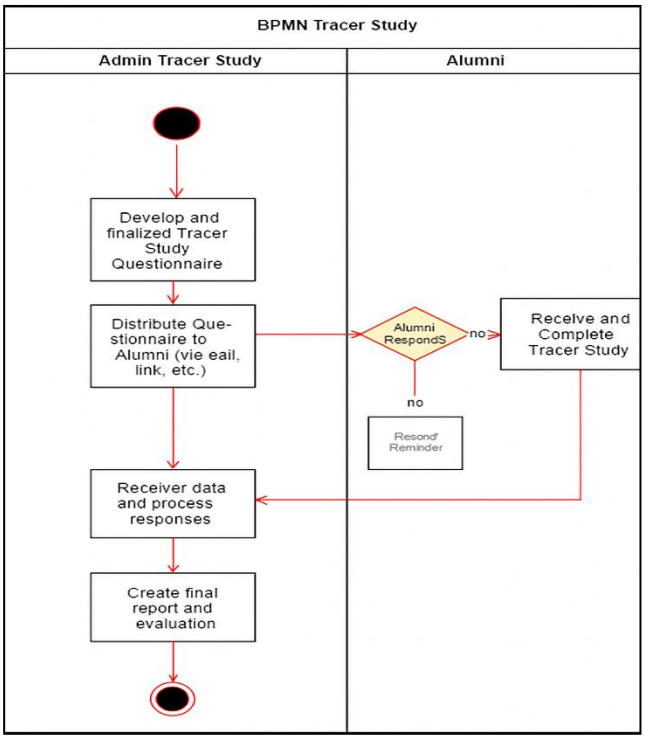


**Figure 5:** BPMN for Tracer Study

- BPMN for Job/Internship Vacancy Information
  The job or internship vacancy information service aims to bridge students and alumni with the professional world by providing updates on relevant and credible opportunities.

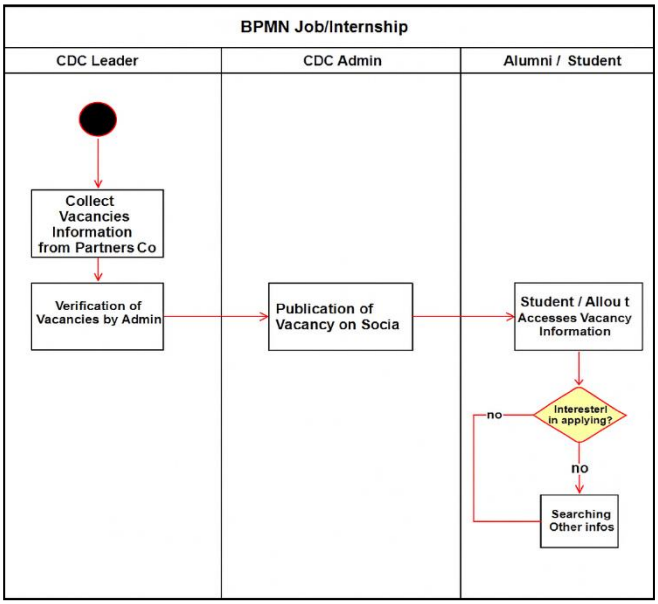


**Figure 6:** BPMN for Job/Internship Vacancy Information

- BPMN for Industry Collaboration
  Industry collaboration is a strategic partnership process between the CDC and companies/institutions aimed at creating opportunities for recruitment, internships, or other development programs.

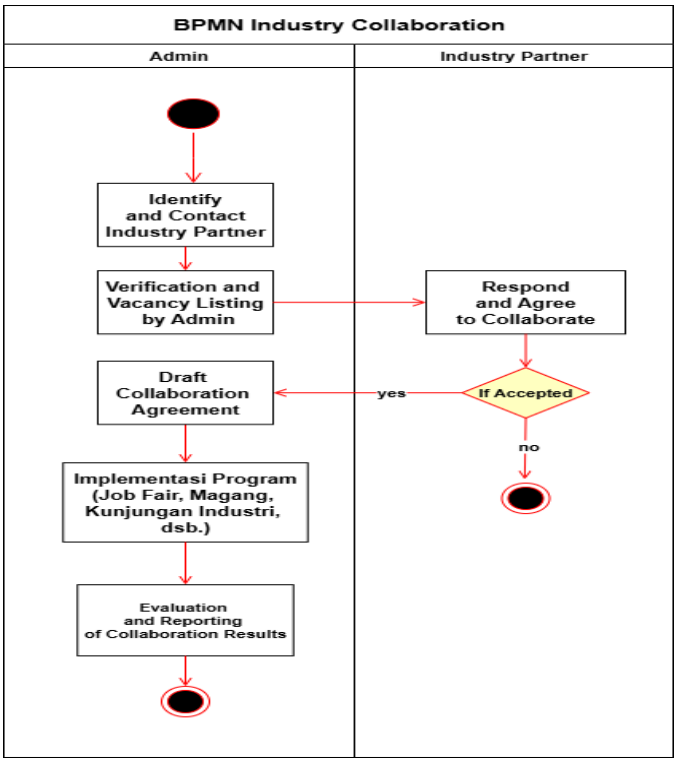


**Figure 7:** BPMN for Industry Collaboration

After mapping the main activity flows through BPMN, the next step is to model the supporting activity processes.

b. Relationship Between Business Functions and Organizational Units
To ensure effective service delivery at the Career Development Center (CDC), it is essential to understand how core business functions are carried out by the various organizational units involved. Business functions such as counseling, psychological testing, tracer studies, job vacancy information, and student advocacy do not operate independently; instead, they are coordinated through specific assigned roles.

**Table 1:** Matrix of Business Function and Organizational Unit Relationships

| Business Processes / Organitation | Students/ Alumni | Academic Staff | Job Bureau Team | Tracer Study Team | Psychological Test Team | Industry Collaboration |
|---|---|---|---|---|---|---|
| Implementation of Counseling | 2 | 2 | 2 | 2 | | |
| Filling Alumni Results | 2 | 2 | | 2 | 2 | |
| Publication of Vacancy Information | 2 | 2 | | 2 | | |
| Collaboration Program Implementation | 1 | 2 | | | | 2 |
| Problem Solving | 2 | 2 | | | | 2 |
| Situation of Consultation | 2 | 2 | 2 | | | |
| Student Assistance | 2 | 2 | 2 | | | |

The following matrix table illustrates the relationship between CDC's core business functions and the organizational units involved in their execution. The number 2 indicates a primary role or direct executor of a function, 1 indicates involvement as a supporter or service user, while blank cells signify that the unit is not directly involved in the corresponding business function.

c. Information System Process Flow

The service process flow within the CDC describes the connection between each service activity and its executing unit to ensure coordination. These interconnected processes range from the implementation of counseling and psychological testing to the publication of job vacancy information and follow-up of partnership programs. Each activity involves different organizational roles based on the responsibilities and functions of each unit in supporting students' career readiness.

d. Current Systems and Technology

Currently, the systems and technologies used by the CDC at Ma'soem University remain limited and are not fully integrated. Most processes are still carried out manually, including recording counseling sessions, registering psychological test participants, and disseminating job vacancy information, which still relies separately on social media platforms.

There is no centralized system to manage alumni data, tracer study questionnaires, and follow-ups on industry partnerships. This condition results in duplicated tasks, delays in information distribution, and difficulties in conducting comprehensive service monitoring and evaluation.

**Table 2:** Software Used

| No | Software Type | Product | Purpose |
|---|---|---|---|
| 1 | Operating System | Windows 10 | Connects hardware with CDC service applications |
| 2 | Data Processing | Microsoft Word | Creates documents and reports for counseling and tracer study services |
| | | Microsoft Excel | Processes data from psychological tests and alumni tracer studies |
| | | Microsoft PowerPoint | Prepares training materials and CDC activity presentations |

**Table 3:** Hardware Used

| No | Hardware | Specification / Example Product | Usage Description |
|---|---|---|---|
| 1 | Computer | HP Pavilion 20-C006L | Used by staff for CDC service operations |
| 2 | Storage Media | Local files (Microsoft Office) | Not yet connected to a centralized database |
| 3 | Input Devices | a. Monitor<br>b. CPU<br>c. InFocus | For user interaction and presentation needs |
| 4 | Output Devices | a. Mouse<br>b. Keyboard<br>c. Printer | Used in daily CDC service system operations |

- Analysis of the Current Condition

Based on observations and interviews, the current systems and technologies used by the Career Development Center (CDC) at Ma'soem University are still limited and not fully integrated. Most operational processes are carried out manually, such as recording counseling services, conducting psychological tests, and

disseminating job vacancy information via social media, without a robust centralized data system. The absence of an integrated system has resulted in duplicated tasks, delays in information dissemination, and difficulties in monitoring and evaluating services comprehensively.

- Data Architecture
  The designed data architecture refers to the main service entities of the CDC, including students/alumni, counselors, partner companies, service activities (such as counseling, psychological tests, and tracer studies), as well as supporting documents like test results, CVs, and referral letters. The data is structured in a relational format, enabling inter-entity connections and facilitating integration between system modules.
- Candidate Data Entities
  At this stage, data entities are determined to support the execution of existing business functions. Entity identification is based on business functions designed within the CDC business model. Referring to the value chain and main activities at Ma'soem University's CDC, several key entities have been identified as the foundation for developing the data architecture. These entities represent critical data objects involved in various services such as counseling, psychological testing, tracer studies, job vacancy dissemination, and industry collaboration. The identified data entities are as follows:

**Table 4:** Candidate Data Entities

| No | Entity | Description | Attributes |
|---|---|---|---|
| 1 | Student / Alumni | Stores personal data and service interaction history with the CDC | Student ID, Name, Study Program, Counseling History, Test Results, Employment Status |
| 2 | Counselor | Information on staff providing counseling/psychological testing services | Counselor ID, Name, Specialization, Schedule, Service History |
| 3 | Company / Partner | Data of partner institutions or job/internship providers | Company ID, Institution Name, Type of Partnership, Job Vacancy List |
| 4 | Service Activity | Activities attended by students/alumni | Activity ID, Service Name, Date, Type of Service (e.g., test, training) |
| 5 | Test / Evaluation Result | Stores outcomes of assessment-based services | Result ID, Test Type, Score, Recommendations, Counselor Notes |

- Entity Relationship Diagram (ERD) Modeling

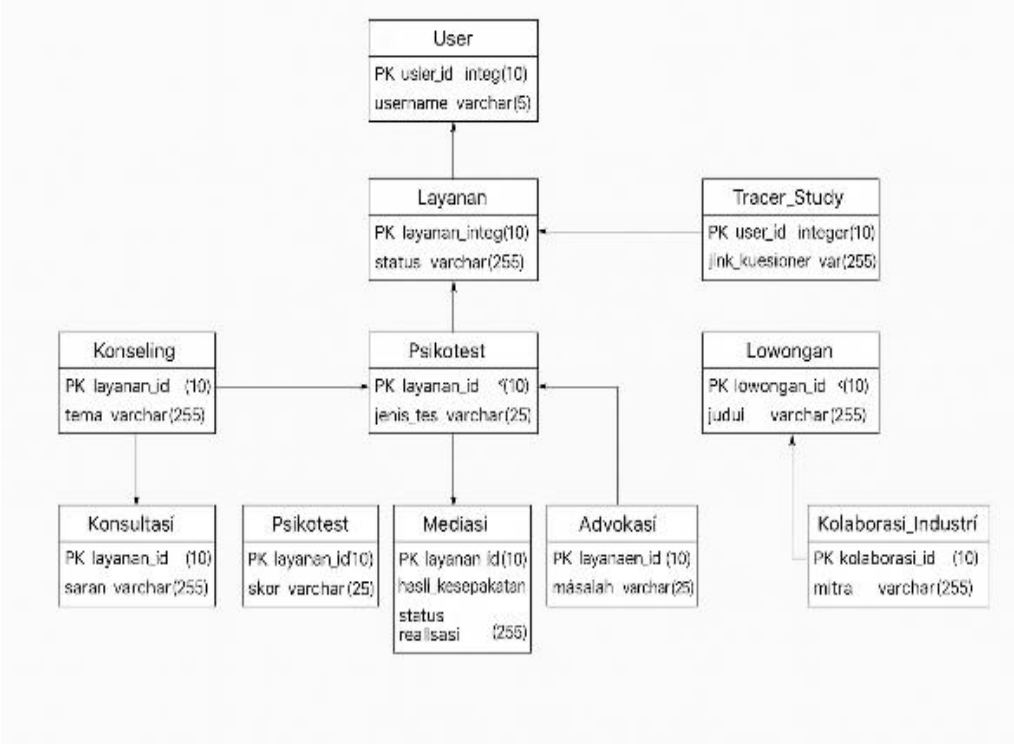


**Figure 8:** CDC ERD

- Application Architecture

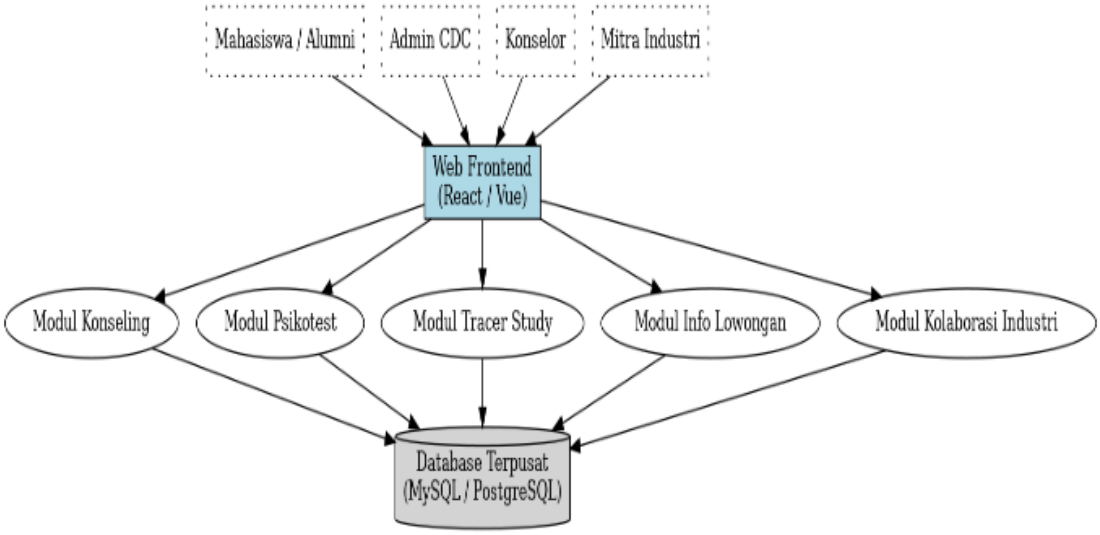


**Figure 9:** Application Architecture

At this stage, the definition of the information system that serves as the main candidate for building an integrated service application for the Career Development Center (CDC) at Ma'soem University is carried out. This application architecture provides a comprehensive definition of the core functions that must be performed by the system to manage data, facilitate services for students/alumni, and support CDC's business functions in an integrated manner. The application architecture is determined through the following steps:

- Grouping application systems based on an Application Portfolio directly related to CDC's main business functions—such as counseling services, psychological testing, tracer studies, job vacancy information, and industry collaboration. This grouping also takes into account the key data entities previously defined in the ERD model.
- From the grouping results, the required application modules to support CDC services can be identified. These include: Counseling Module, Psychological Test Module, Tracer Study Module, Job Vacancy Module, and Industry Collaboration Module. Each module communicates through a frontend interface and connects to a centralized database, with user access rights managed based on roles.

- Software Specifications
  A critical component in supporting the operation of the system at the Career Development Center (CDC) of Ma'soem University is the selection of software that meets proper standards. The software must be legally licensed and capable of supporting service activities such as counseling, tracer studies, and job recruitment. The integrated information system is expected to be web-based and accessible via modern browsers, with security enforced through the HTTPS protocol. The primary software solutions used by CDC include:

**Table 5:** Software Specifications

| No | Software System | Description |
|---|---|---|
| 1 | CDC Information System | Web-based application built using PHP, MySQL, and the Laravel Framework |
| 2 | Operating System | Windows 10 Pro (licensed) |
| 3 | Database Server | MySQL 8.0 |
| 4 | Web Server | Apache 2.4 |
| 5 | Browser | Latest versions of Google Chrome / Mozilla Firefox |
| 6 | Antivirus | Windows Defender + Smadav Pro |

- Hardware Specifications
  The computers used by CDC staff and administrators must have sufficient capacity to run the information system and support applications smoothly. These specifications are adjusted to meet the minimum IT

standards within the university environment.

**Table 6:** Hardware Specifications

| No | Hardware | Specification |
|---|---|---|
| 1 | Desktop Computer | Asus M3400 Desktop PC |
| 2 | Processor | Intel® Core™ i5-11400 |
| 3 | Memory | 32 GB DDR4 |
| 4 | Storage | 512GB SSD + 2TB HDD |
| 5 | Printer | Standard LaserJet and Inkjet printers |
| 6 | Input Devices | Keyboard, Mouse, Scanner |

- Technology Architecture
  Following the application architecture stage, the next step involves developing a **technology architecture** that supports the operational environment of the CDC's integrated service application, data management, and the execution of business functions. This technology architecture is intended to ensure that the system operates in a stable, secure manner and is accessible to all stakeholders according to their roles.

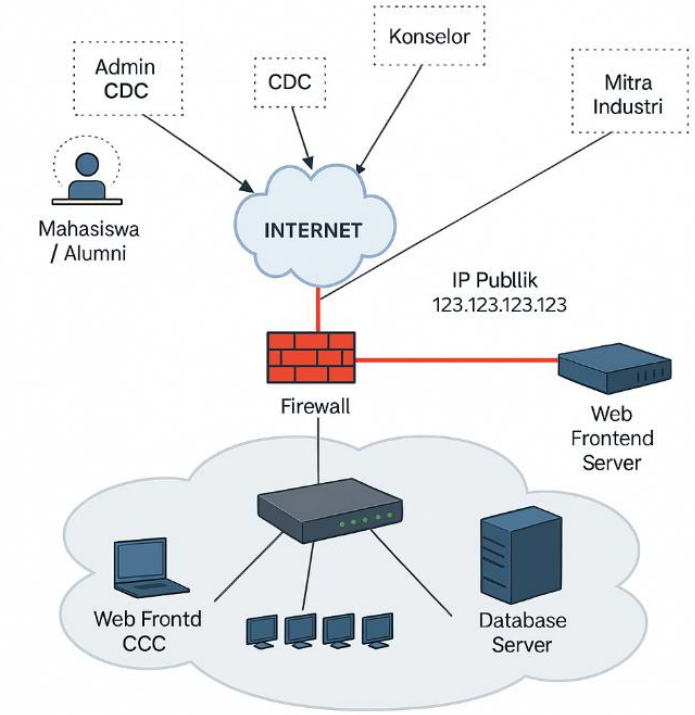


**Figure 10:** Network Technology Architecture

- Implementation Plan
  Once the application and technology architectures have been designed, the next step is to develop a step-by-step implementation plan. This phase ensures that each component of the system runs properly, is well integrated, and is ready to be used by all CDC service users. The implementation stages for the CDC Information System at Ma'soem University are planned as follows:
  - Development of Core Modules
    The initial phase focuses on developing the main modules: Counseling Module, Psychological Testing Module, and Job Vacancy Information Module. These are prioritized due to their high usage by students and alumni and their direct impact on career readiness.
  - Alumni Data and Tracer Study Integration
    Once the core modules are operational, the next phase involves developing the Tracer Study Module, including integration with existing alumni data. This data serves as a foundation for tracking and systematically analyzing graduate outcomes.

- Internal System Testing
  The system will be tested internally by CDC staff to validate technical functions and workflow logic before it is launched to end users.
- User Training and System Launch
  All users—including students, administrators, and industry partners—will receive system training. After that, the system will be officially launched and actively operated.
- Regular Monitoring and Evaluation
  The CDC will conduct routine evaluations to ensure the system runs smoothly, identify technical issues, and implement improvements based on user feedback.

## 4. Conclusion

Based on the analysis and discussion conducted, the following conclusions can be drawn:

a. In planning the information system architecture for the Career Development Center (CDC) at Ma'soem University, the Enterprise Architecture Planning (EAP) approach was applied by following a systematic sequence of stages: planning initiation, business process modeling, data architecture identification, application architecture design, technology architecture, and the implementation (blueprint) stage.
b. With a well-structured information system planning, the CDC of Ma'soem University is expected to develop integrated digital services including counseling, psychological testing, tracer studies, job vacancy information, and industry collaboration. The results from this planning phase will serve as the foundation for step-by-step implementation to support the effectiveness and efficiency of CDC services in accordance with its established goals

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