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Information System Website-Based Profile of the Ibnu Nadzir Education Foundation with NLP Implementation for Smart FAQ

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Abstract

The rapid advancement of information technology has significantly transformed how educational institutions disseminate information to the public. Yayasan Pendidikan Ibnu Nadzir (YPIN), a character-based educational foundation in Batam City, Indonesia, still relies on brochures and verbal communication as its primary means of information dissemination. This approach leads to difficulties in accessing complete institutional information, a weak professional image, and recurring repetitive questions from prospective students' guardians. This study aims to design, implement, and evaluate a website-based profile information system for YPIN integrated with Natural Language Processing (NLP) to enable a Smart FAQ feature. The system was developed using the Agile Development method, encompassing iterative stages including requirements analysis, system design, development, testing, deployment, and review. The system design utilized UML diagrams, Entity Relationship Diagrams (ERD), and user interface mockups. The Smart FAQ feature was implemented using a text preprocessing pipeline consisting of case folding, cleansing, normalization, tokenizing, stopword removal, and stemming, followed by TF-IDF weighting and Cosine Similarity for measuring question-answer relevance. The system was successfully deployed on the domain ypin.or.id using PHP 8.7, MySQL, and HTTPS-secured hosting. Functional testing achieved 100% success, Smart FAQ accuracy reached 76%, and content validity by information system experts yielded a Content Validity (CV) score of 1.00, indicating very valid results. A user acceptance evaluation involving 18 respondents produced an average Likert score of 4.49, categorized as Excellent. These results demonstrate that the developed system effectively addresses the identified problems and improves information services and institutional professionalism at YPIN.

INTRODUCTION

The development of information technology, especially the internet, has provided great potential that can be used to improve the quality of information services in various types of institutions, ranging from companies to educational institutions. In educational institutions, information systems play an important role as a strategic means for the delivery of institutional profiles, promotion, administration, and other information dissemination needed by the community. The use of this website-based technology not only helps the public obtain educational information faster and easier, but is also able to build a better and professional image for the institution (Utami et al., 2023).

Yayasan Pendidikan Ibnu Nadzir (YPIN) is an educational institution located in Kp. Dalam Block A No. 14, Baloi Indah Village, Lubuk Baja District, Batam City. This foundation focuses on the implementation of character education based on the values of ahlussunnah wal jama'ah (aswaja), which is realized through book study activities and moral development. As a relatively new educational institution, and with a directed vision and program, YPIN has great potential to play a role in shaping the young generation with character and noble character in its environment.

Based on the results of an interview with the Foundation's Trustee, Mr. Ali Samani, on Monday, November 3, 2025 at YPIN, it is known that the foundation is still using brochure media and oral communication for information dissemination. This causes the community and prospective guardians of students to have difficulty obtaining complete and easily accessible information. In addition, the use of the media also makes the professional image of the foundation as a modern educational institution not well formed, so that the public has not obtained a strong picture of the quality and credibility of the institution. Another problem that arises is that many of the same questions are asked repeatedly by prospective guardians of students and the community, so that the process of delivering information takes longer because it has to be answered one by one (Abidah et al., 2025; Abdillah et al., 2025).

With the existence of a Website-Based Profile Information System, information can be accessed online by the public at any time so that the provision of data can always be up-to-date. This ease of access allows the process of delivering information to be faster and no longer dependent on brochure media. In addition, the profile information system also provides added value to improving the image of educational institutions and expanding the reach of information to the public (Ahmadar et al., 2021; Andria & Dewi, 2024; Cahyani et al., 2023). On the other hand, the development of artificial intelligence technology opens up opportunities for interactive features, such as (Sigh) et al ., 2022) (Andria & Dewi, 2024) (A. O. Sari & Kholil, 2025) Natural Language Processing (NLP), to improve the quality of digital services. The use of NLP in the automated question and answer system feature is able to speed up responses to repetitive questions, reduce the burden on officers, and provide a more responsive and personalized information access experience for users. Based on these findings, it is hoped that a profile information system equipped with NLP technology can be a solution to improve information services and support the professionalism of YPIN as a modern educational institution. (Fauzi & Sutabri, 2025)

Based on the description of the problem and potential solutions, the author chose this topic as the focus of the thesis entitled "Website-Based Profile Information System of the Ibnu Nadzir Education Foundation with NLP Implementation for Smart Faq". With this profile information system, it is hoped that the Ibnu Nadzir Education Foundation (YPIN) can not only present institutional information in a more professional manner and improve the institution's image, but also through the application of the NLP-based smart faq feature can facilitate access to information, by providing quick and accurate answers to every user question, thereby reducing the occurrence of repetitive questions (Lubis et al., 2022; Miswar, 2021).

Based on the background that has been described, several problems have been successfully identified. First, the dissemination of information relies only on brochures and verbal communication, which results in the community and prospective guardians of students having difficulty obtaining complete and easily accessible information (Gani et al., 2023; Kala'lembang et al., 2021). Second, the use of brochure media and oral communication has made the professional image of the foundation as a modern educational institution not well formed, so that the public has not obtained a strong picture of the quality and credibility of the institution. Based on these identified problems, the main problems are formulated as follows: how to design a website-based Ibnu Nadzir Education Foundation Profile Information System using the agile development method, how to implement the website-based profile information

system using agile development, and what is the level of user acceptance and the effectiveness of the system in addressing the problems that have been identified (Hutauruk & Pakpahan, 2021; Oktavianus et al., 2025; Pasaribu, 2021).

The objectives to be achieved in this study are to design a website-based Ibnu Nadzir Education Foundation Profile Information System using the agile development method, to implement the website-based profile information system using the agile development method, and to evaluate and measure the level of user acceptance and the effectiveness of the system in providing solutions to the problems that have been identified.

This research provides both theoretical and practical benefits. Theoretically, this study contributes to the body of knowledge on information systems, particularly in the integration of Natural Language Processing (NLP) technology with educational institution profile information systems. It also extends the application of agile development methods in the context of non-profit educational institutions and provides empirical evidence on the effectiveness of TF-IDF and Cosine Similarity algorithms for handling repetitive questions in community information services. Practically, this research benefits the Ibnu Nadzir Education Foundation by providing a professional website-based information system that enhances the institution's credibility and public image, enables 24/7 access to institutional information for the community and prospective students' guardians, and reduces the burden on foundation administrators through the Smart FAQ feature that automatically answers repetitive questions, thereby improving service efficiency and responsiveness.

RESEARCH METHOD

This study employed a qualitative research approach with a descriptive orientation. The qualitative approach was chosen because it allows researchers to gain an in-depth understanding of the phenomenon under study, particularly regarding the design, implementation, and evaluation of a website-based profile information system integrated with Natural Language Processing (NLP) for Smart FAQ. The descriptive nature of this research is intended to systematically describe the stages of system development, the results of functional testing, the accuracy of the NLP algorithm, and the level of user acceptance of the system that has been deployed.

Research Time and Place

The time for the implementation of research at the Ibnu Nadzir Education Foundation, starts from November 2025 to January 2026 at the Ibnu Nadzir Education Foundation, Kp. Dalam Block A No. 14, Baloi Indah, Lubuk Baja, Batam City.

Data Type

In this study, the type of data used is qualitative. What was obtained using two main sources, namely primary data and secondary data.

Primary data

Primary data is the main information obtained by researchers directly during the implementation of the research. This data is sourced from the original party, such as respondents or informants who are related to the variables being studied. The primary data in this study are: (Shawn & Shawn, 2024)

1. Data from interviews with YPIN Trustees.
2. Data from observations on YPIN.

Secondary Data

Secondary data is research data obtained indirectly through various intermediary media. In other words, this data is not the result of direct collection by researchers, but rather comes

from previously available sources, such as documents, literature, or data collected by other parties. The secondary data in this study are: (Shawn & Shawn, 2024)

1. Thesis Writing Handbook at the Faculty of Science and Technology, Ibnu Sina University.
2. Journals and other reference sources on the internet.
3. A reference list of website-based profile information systems as a reference for designing a Website-based Ibnu Nadzir Education Foundation Profile information system.

Data Collection Methods

The data collection method used to obtain the required data, using several methods including observation, interviews, and literature studies.

Observations

The observation method is a data collection technique that is carried out by directly observing conditions or activities in the field. In this study, observations were made on the process of accepting new students, as well as the media used at the Ibnu Nadzir Education Foundation. (Fatimah et al., 2025)

Interview

Interviews are a data collection technique that is carried out through direct interaction between the researcher and the party providing information. In this study, an interview was conducted with Mr. Ali Samani, as the Trustee of the Ibnu Nadzir Education Foundation. (Fatimah et al., 2025)

Literature Studies

Literature study is a method of collecting information that is carried out by examining various written sources, such as books, scientific articles, official documents, and the results of previous research. In this study, a literature study was carried out by tracing various relevant written references to support the research, including a guidebook for writing Ibnu Sina University Thesis, a review of scientific journals related to the design of a profile information system, and an analysis of various existing profile information systems as a reference in designing the features and interfaces of the YPIN profile information system. (Fatimah et al., 2025)

Data Processing Methods

The data processing method is a systematic stage to transform raw data that has been collected from the field into structured information that is ready to be used in system development. In this study, data processing is carried out by combining the qualitative data analysis techniques of the Miles and Huberman Model with (Rusli et al., 2025) text mining processing techniques for the implementation of NLP. The stages of data processing carried out are as follows:

Data Reduction

Data reduction is a selection process, focusing on simplification, abstraction, and transformation of rough data that arises from field records. (Nurhuda & Sari, 2025)

Text Pre-processing

Especially for data related to NLP implementation, raw text data is processed to be structured. This stage aims to break down the raw data into smaller and easily analyzed parts through the following steps: (Syllables & Gold, 2023)

a. Case Folding, which is converting all letters in the document to lowercase letters to maintain data consistency.
b. Data Cleansing, which is the cleansing of data from irrelevant elements.
c. Normalization, which is standardizing words into standard words or standards in the Indonesian language.
d. Tokenizing, which is breaking sentences into chunks of words or small units called tokens.
e. Stopword Removal, removes words that are not important, and have no descriptive meaning in the search.

f. Stemming, converting the adjoining words into the form of the root word.

Transformation and Weighting

After the text data is clean, the process of transforming textual data into numerical data is carried out. The method used is TF-IDF (term frequency-inverse document frequency). This method calculates the weight of each word by combining the frequency of occurrence of the word in the document (TF) and the degree of uniqueness of the word in the entire document collection (IDF). (Syllables & Gold, 2023)

Data Presentation

Data presentation is a step of organizing information that has been processed to make it easier to draw conclusions and plan actions. (Nurhuda & Sari, 2025)

Troubleshooting Framework

Problem-solving frameworks are systematic steps taken by researchers to solve problems and achieve research goals. In this study, the problem-solving framework refers to the agile method cycle. The flow of the troubleshooting framework can be seen in the following Figure 3.1:

Get Started

The opening stage marked the start of the research process and the development of a website-based profile information system for the Ibnu Nadzir Education Foundation.

Problem Identification

At this stage, the problems that occur in YPIN are identified through observation, interviews, and literature studies.

Data Collection

After the problem is identified, the next stage is the collection of data which is used as the basis for the research. The data collected is sourced from primary data and secondary data.

Requirement

The requirement stage is the process of analyzing system needs based on primary data and secondary data that has been collected. The data obtained is reduced to filter relevant information as the basis for formulating system needs. At this stage, the needs of the system are formulated consisting of functional needs and non-functional needs.

Design

At this stage, the functional and non-functional needs that have been analyzed are translated into system design using various UML modeling diagrams, databases using erd, user interface design using mockups, and smart faq flow design.

Development

The implementation stage is carried out by translating the entire design into the form of program code. The database is also implemented according to the designed RD. At this stage, the implementation of the smart faq feature is also carried out, which includes pre-processing of text, word weighting using tf-idf, and calculation of similarity using cosine similarity.

Testing

The testing stage is carried out to ensure that the system runs according to the predetermined needs. The test was carried out through three approaches, namely functionality testing using black box testing, accuracy testing on NLP-based smart faq features , and testing by two information system experts. If the system passes the test, it will enter the next stage, but if it fails, it will return to the development stage.

Deployment

The deployment stage is the process of implementing a system that has passed all stages of testing to the actual use environment. At this stage, the website-based YPIN profile information system is published so that it can be accessed by end users, both the general public and foundation administrators, in accordance with their respective roles and functions.

Review

The review stage is carried out to evaluate the system based on the results of questionnaires from users. This evaluation aims to assess the impact of the system in overcoming the problems that have been identified.

Finish

The final stage which signifies the entire system development process and system feasibility evaluation has been completed.

RESULTS AND DISCUSSION

Design

The design stage includes four main aspects, namely designing uml diagrams, designing databases using erd, designing user interfaces using mockups, and smart faq system flows.

UML (Unified Modeling Language) Design

The UML design designed in this study includes use case diagrams, activity diagrams, sequence diagrams, and class diagrams.

Use Case Diagram

Use case diagrams describe the interaction between actors and systems. The YPIN Profile Information System involves two main actors, namely General Users (the community/guardians of students) and Administrators (foundation administrators).

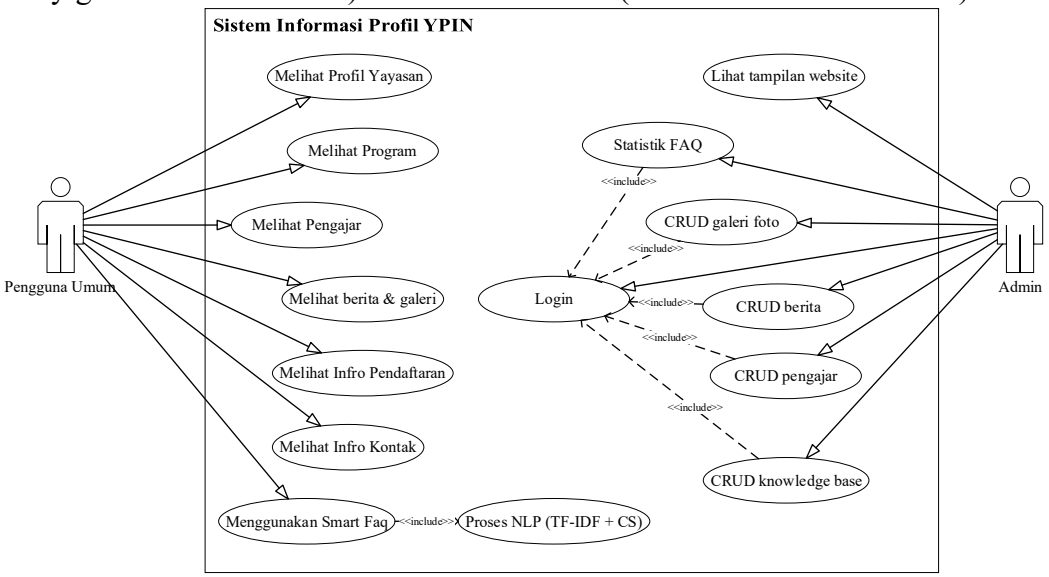

Figure 1. Use Case Diagram YPIN Profile Information System

Source: System Design Results, 2026

Based on Figure 1, the system has 15 use cases consisting of 8 use cases for general users and 7 use cases for administrators. Use cases related to the use of smart faqs are the main distinguishing feature of this system compared to previous information dissemination systems.

Activity Diagram

An activity diagram describes the flow of activities or processes that occur within the system. This study designed six activity diagrams to model the flow of the main functionalities of the system, namely the use of smart faq by general users, access to information by general users, administrator login, add data (create), edit data (update), and delete data (delete). The six activity diagrams are presented as follows.

a. Smart Usage Activity Diagram FAQ

The smart faq usage activity diagram describes the flow of interaction between users, systems, and databases in an automated Q&A process, starting when the user opens the smart

faq widget, types a question, and submits it. The system then processes queries on all data retrieved from the database. The system will then send the answer with the highest score to the user.

b. Activity Diagram Access Information by General Users

The activity diagram of access to information by general users on the YPIN website describes the user's navigation flow starting from opening the website to the system displaying the home page. The user can then select the navigation menu as per the information needs, and the system will display the selected page.

c. Activity Diagram Login Administrator

The administrator login activity diagram describes the authentication flow that begins when the administrator accesses the login page and the system displays a form containing a username and password. The administrator then fills out the form, the system checks the match of the data to the database. If it doesn't match, the system displays an error message and asks the administrator to try again, while if it's valid, the system creates a login session and directs the administrator to the dashboard page as the main page of the administration panel.

d. Activity Diagram Add Data (Create)

The Add Data activity diagram describes the flow of adding new data in the administrator panel, starting when the administrator clicks the Add button on the content management page until the system displays the input form. The administrator then fills in the entire field and presses the Save button, then the system runs the INSERT INTO query on the appropriate table to save the data, then displays a success notification and directs the administrator back to the data list page to see the addition results.

e. Activity Diagram Edit Data (Update)

The Edit Data activity diagram describes a data update flow that begins when the administrator selects the data in the table and clicks the Edit button, then the system retrieves the data by id using the SELECT query and displays the completed form. The administrator makes the changes and presses the Save button, then the system runs the UPDATE WHERE id query to update the data on the database.

e. Activity Diagram Delete Data (Delete)

The Delete Data Activity diagram describes a data deletion flow that begins when the administrator selects the data in the table and clicks the Delete button, and then the system executes the DELETE WHERE id query on the corresponding database table and checks the results. Then, the system displays a success notification and removes the data from the list.

Sequence Diagram

Sequence diagrams depict the sequence of interactions between objects in a system based on the time dimension. This study designed six sequence diagrams that represent the flow of the main functionalities of the system, namely smart faq, administrator login, access to information by general users, add data (create), edit data (update), and delete data (delete). The six sequence diagrams are presented as follows.

a. Sequence Diagram Smart FAQ

The Smart FAQ sequence diagram depicts the interaction between the user, the faq widget, the nlp process, and the database that starts when the user opens the widget and the system displays it, then the user enters and sends the question processed through preprocessing, tf-idf, and cosine similarity using data from the database, then the system will return the best answer.

b. Sequence Diagram Login Administrator

The administrator login diagram sequence describes the authentication flow between the administrator, the login page, the AuthController, and the database that starts when the administrator opens the login page and fills in the credentials, then the data is sent to the AuthController to be validated and checked to the database using the SELECT query; if the

credentials are valid, the system creates the session and directs to the dashboard, while if it is invalid the system displays a "login failed" message and prompts the administrator try again.

c. Sequence Diagram of Access to Information by General Users

The information access sequence diagram describes the interaction between the user, the website page, the PageController, and the database that begins when the user opens the website and the system loads the home data through the controller of the database, then displays it to the user, when the user selects the navigation menu, the system again requests the corresponding page data to the database through the controller and displays the selected page.

d. Sequence Diagram Add Data (Create)

The sequence diagram describes the process of adding data by administrators through interaction with admin pages, contentControllers, and databases, starting from clicking the Add button to filling out and submitting forms, and then the data is processed by the controller; if valid, an INSERT query is made and the system displays a success notification and redirects to the data list, while if it is invalid the system returns an error message to be corrected.

e. Sequence Diagram Edit Data (Update)

The sequence of data edit diagrams describes the data update process that starts when the administrator selects and edits the data, then the system retrieves the data from the database to display on the form, after updating the data is sent to the controller for validation, if valid the UPDATE query is performed and the system displays a success notification and redirect, while if it is invalid, the system displays an error message to the administrator.

F. Sequence Diagram Delete Data (Delete)

The delete data diagram sequence describes the data deletion process that begins when the administrator selects the data and presses the Delete button, then the system displays a confirmation; if approved, the controller executes the DELETE query to the database and returns the success status displayed as a notification as well as updating the data list, while if canceled, the process is stopped and the data is retained.

Class Diagram

The class diagram describes the structure of the classes involved in the system along with the attributes, methods, and relationships between classes. The YPIN Profile Information System is built using native PHP with a class-based procedural paradigm, so that the class diagram reflects the main classes that are implemented, namely databases, nlp, and page classes (news, gallery, teacher, knowledgebase, and logfaq).

Entity Relationship Diagram

The database design was carried out using an entity relationship diagram (erd) to describe the entity structure, attributes, and relationships between tables used in the system. The YPIN Profile Information System database consists of twelve main tables.

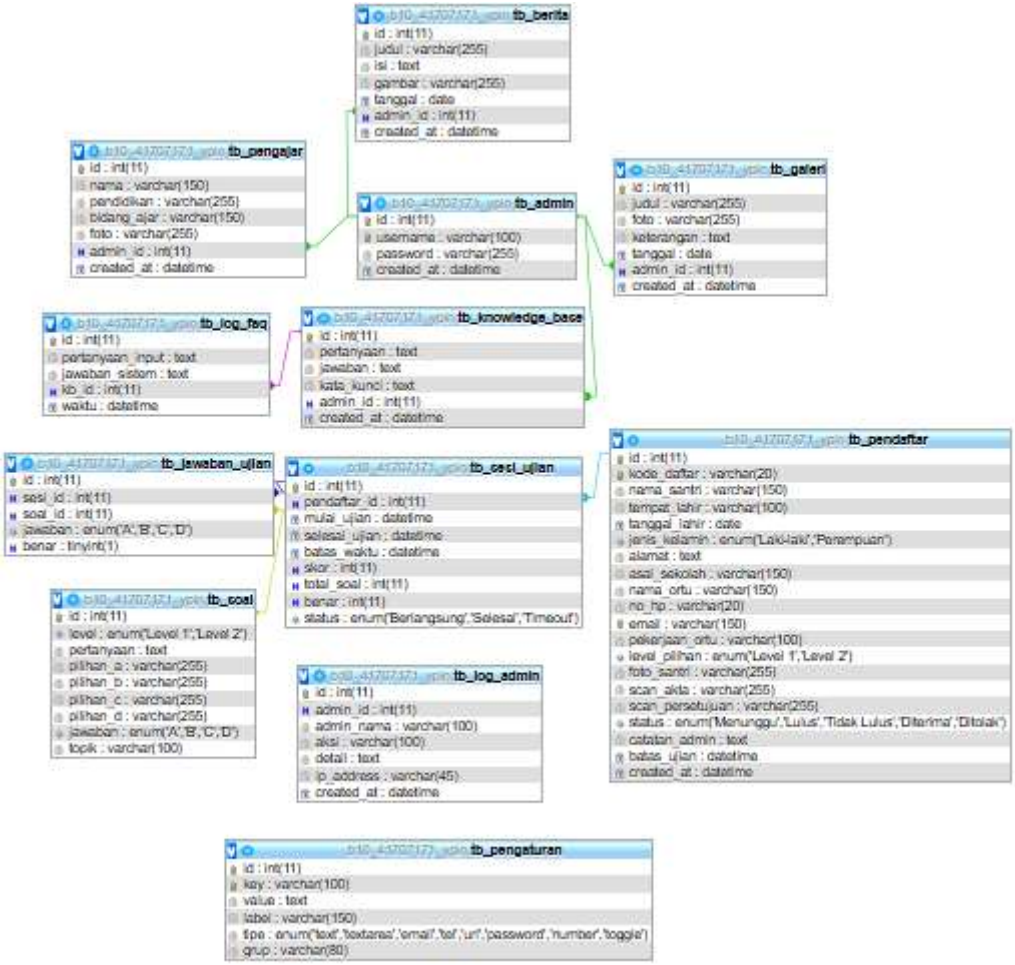

Figure 2. Entity Relationship Diagram
Source: Database Design Results, 2026

Based on the ERD in Figure 2, the relationships between tables in the built information system database show the interconnectedness between entities that support each other in the data management process. Each table has a specific role and is connected through primary keys and foreign keys. The relationships between the database tables in full are presented in Table 1 below.

Table 1. Relationships Between Database Tables

No.	Table of Origin	Objectives Table	Relationship	Relationship Key	Remarks
1	tb_admin	tb_berita	1 : N	admin_id	Admins can create a lot of news
2	tb_admin	tb_galeri	1 : N	admin_id	Admin manages multiple galleries
3	tb_admin	tb_pengajar	1 : N	admin_id	Admin manages teacher data
4	tb_admin	tb_knowledge_base	1 : N	admin_id	Admin manages data FAQs
5	tb_admin	tb_log_admin	1 : N	admin_id	Admin activity is logged in the log
6	tb_knowledge_base	tb_log_faq	1 : N	kb_id	One FAQ is used in many interactions

7	tb_pendaftar	tb_sesi_ujian	1 : N	pendaftar_id	Registrants can take multiple exam sessions
8	tb_sesi_ujian	tb_jawaban_ujian	1 : N	sesi_id	One session has multiple answers
9	tb_soal	tb_jawaban_ujian	1 : N	soal_id	One question was answered by many participants
10	tb_knowledge_base	tb_log_faq	1 : N	kb_id	Optional relationship (NULL if no answer is found)
11	tb_pengaturan	(Global System)	-	key	Used as a dynamic configuration of the system
12	tb_log_faq	(FAQ analytics)	-	-	Storing a history of user queries
13	tb_pendaftar	(selection process)	-	-	Used in registration & selection flows
14	tb_sesi_ujian	(exam process)	-	-	Organizing the course of the participant's exam

Source: Database Design Results, 2026

Smart Flow Planning FAQ

Smart faq flow design describes the stages of text processing from user question input to the output of the displayed answer. The smart faq system uses an nlp approach with the tf-idf algorithm for word weighting and cosine similarity to measure the degree of similarity between the input question and the data on the knowledge base. The smart faq system pipeline consists of six main stages of text preprocessing and two stages of computing. The six stages of preprocessing are described in detail in Table 4.11 below.

Table 2. Stages Preprocessing Text

No	Stages	Function	Sample Process
1	Case Folding	Convert the entire text to lowercase	"What is YPIN?" → "what is YPIN"
2	Cleansing	Remove non-alphanumeric characters and punctuation marks	"What is YPIN?" → "What is YPIN"
3	Normalization	Remove excess spaces and tidy up text	"What is YPIN" → "What is YPIN"
4	Tokenizing	Breaking text into units of words (tokens)	"what is ypin" → ["what", "it", "ypin"]
5	Stopword Removal	Remove meaningless common words	["what", "it", "ypin"] → ["ypin"]
6	Mood (Writer)	Changing an affix word to its base form	"registration" → "registration", "fees" → "fees"

Source: System Analysis and Design Results, 2026

After preprocessing, the system calculates the TF-IDF weight for the question and the whole document. The TF value is normalized, then multiplied by the smooth IDF. Then the cosine similarity between the question vector and each document is calculated. The document with the highest score of at least 2.5 is selected and displayed as an answer, if none exceeds the 2.5 limit, the system sends a message that the question cannot be answered yet and suggests contacting the admin.

Deployment

The deployment stage is the process of implementing a system that has passed all stages of testing to the actual use environment. At this stage, the website-based YPIN Profile Information System is published so that it can be accessed by users, both the general public and foundation administrators, through the internet network.

Hosting and Domain Specifications

The YPIN Profile Information System is deployed using hosting services from Rumahweb Indonesia. The domain used is ypin.or.id which is the official domain for the organization (.or.id) in accordance with YPIN's legal status as a legally incorporated foundation. The hosting specifications and domains used are presented in Table 3 below.

Table 3. Hosting and Domain Specifications

Yes	Components	Remarks
1	Hosting Name	Rumah web Indonesia
2	Hosting Plans	Unlimited S
3	Domain	ypin.or.id
4	Domain Type	.or.id
5	PHP Version	PHP 8.7
6	Database	MySQL / MariaDB
7	SSL Certificate	Let's Encrypt (HTTPS Active)
8	Server Location	Indonesia
9	System URL	https://ypin.or.id
10	Copyright © 2019 T	https://ypin.or.id/admin

Source: Deployment Documentation, 2026

The selection of Rumahweb as a hosting service provider is based on several considerations, namely full support for php 8.7 and mysql required by the system, the availability of cPanel as a control panel that facilitates server management, the server is located in Indonesia so that access latency is lower for users in Indonesia, and responsive technical support. SSL certificate from Let's Encrypt is available for free and is configured automatically, So that all communication between the user and the server is encrypted through the HTTPS protocol.

Deployment Process

The deployment process is carried out through several stages. First, the database is migrated from the on-premises environment to mysql hosting by using the Import feature on phpMyAdmin. All database tables along with the initial data were successfully migrated without any problems. Second, all project files are uploaded to the public_html/ directory on the hosting server. Third, the system configuration is updated according to the database connection data and the hosting production url.

Figure 3. System Home Page View in Production Environment
Source: Researcher Documentation, 2026

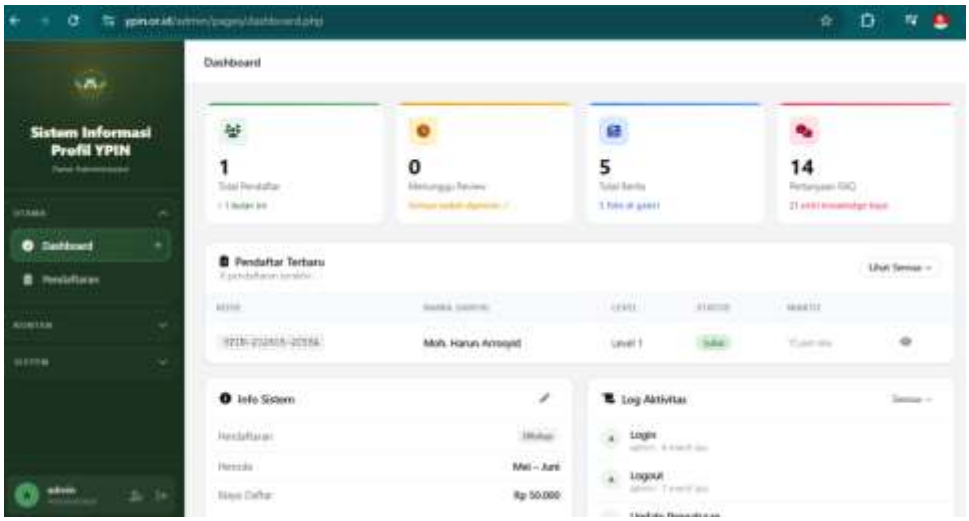

Figure 4. Administrator Panel View in Production Environment
Source: Researcher Documentation, 2026

Once the deployment process is complete, the system can be accessed via the https://ypin.or.id URL for the public page and the https://ypin.or.id/admin for the administrator page. The system runs well in a production environment with a secure https connection, as indicated by the padlock icon on the user's browser.

Review

The review stage was carried out to evaluate the level of user acceptance of the YPIN Profile Information System that had been deployed. The evaluation was carried out through the distribution of questionnaires to users who had used the system, using the Likert Scale 1–5 as a measurement instrument.

Respondent Profile

The questionnaire was successfully collected from 18 respondents consisting of two categories, namely 15 respondents from the Wali Santri category and 3 respondents from the Admin/Foundation Management category. Community respondents are active guardians of students who have accessed ypin.or.id website, while admin respondents are foundation administrators.

Questionnaire Results

The results of the questionnaire from both categories of respondents are presented in Table 4 below.

Table 4. Results of the Questionnaire of All Respondents

No	Respondent Categories	Quantity	Average	Categories Likert
1	Community / Wali Santri	15 people	4,50	Excellent
2	Foundation Admin / Manager	3 people	4,48	Excellent
Overall (18 respondents)		18 people	4,49	Excellent

Source: Research Questionnaire Results, 2026

Based on Table 4, the average overall score of the 18 respondents was 4.49 which was included in the category of Excellent on the Likert Scale (range 4.21–5.00). These results show that the website-based YPIN Profile Information System with the implementation of nlp for smart faq is very well received by all users, both from the guardian side of the student and from the administrator/foundation administrator's side.

CONCLUSION

Based on the results of research that has been conducted on the website-based Ibnu Nadzir Education Foundation Profile Information System with the implementation of NLP for Smart FAQ using the Agile Development method, the following conclusions can be drawn. The website-based profile information system of the Ibnu Nadzir Education Foundation has been successfully designed using the Agile Development method. The YPIN Profile Information System was successfully implemented and deployed in ypin.or.id domain, as well as through tests that achieved 100% functional success, 76% accuracy of the FAQ, and the validity level of the content based on expert assessments with a CV of 1.00 which is included in the category of very valid. Reviews show that the system is very user-friendly, with an average score of 4.49 which is categorized as Excellent, and can solve the main problems, namely providing online information, automating FAQs with high accuracy, and making it easier for admins to manage content. As a suggestion, the Ibnu Nadzir Education Foundation should regularly update the knowledge base used by the Smart FAQ system to improve answer accuracy and relevance over time, as well as promote the website address ypin.or.id to the wider community to maximize the benefits of online information access. Further development of the system could include adding features such as online registration, digital payment integration, and a mobile application version to enhance accessibility. For future researchers, it is recommended to explore the implementation of more advanced Natural Language Processing models, such as transformers or large language models (LLMs), to improve question-answer accuracy beyond the current 76% achieved using TF-IDF and Cosine Similarity. Additionally, comparative studies between different NLP approaches in the context of educational institution information systems could provide valuable insights for further optimization.

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