Public Complaint Management Information System Based on Complaint Topic Classification Using the Naive Bayes Model

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Abstract

Superior public service is an essential component of community life. Pasirkaliki Village faces considerable hurdles in managing public grievances, including inefficiencies and complications in prioritizing complaints according to their urgency. This research proposes the creation of a Public Complaint Management Information System utilising the Naive Bayes method within the CodeIgniter Framework to address these challenges. The Naive Bayes method is selected for its efficacy in classifying data, enabling the identification of patterns and trends in incoming complaints. This system aims to enhance the efficiency and precision of complaint management, deliver swifter and more accurate responses, and ultimately improve public satisfaction with the services. The findings of this research are anticipated to enhance the provision of responsive and high-quality public services in Pasirkaliki Village.

Keywords: *Public Complaint, Naive Bayes, CodeIgniter, Information System, Public Service*

Introduction

Public service is a crucial element of community life, and the management of public complaints is essential for enhancing the quality of that service. (Wabang et al., 2022) Pasirkaliki Village continues to face considerable difficulties in addressing public grievances. A significant obstacle is the inefficiency in resolving complaints and the difficulties in prioritising them according to urgency. This arises from the lack of a system capable of automatically categorising and prioritising complaints, resulting in the oversight or postponement of urgent concerns.

The accessibility of the complaint system for the community presents a significant issue. The current complaint system may insufficiently facilitate accessibility for the public in submitting grievances and for officials in overseeing and addressing them. This restricted access can impede the prompt and precise communication and settlement of grievances. A further concern is the constraint in evaluating complaint data. Currently, no mechanism exists that can determine patterns and trends from incoming complaints, which should inform strategic decision-making to improve public service quality. Inadequate analysis results in less focused decision-making that lacks a foundation in thorough data.

System

A system is a collective of individuals collaborating under systematic and structured regulations to constitute a unit that performs a function to attain a goal (Hariguna & Hananto, 2022; Nanlohy et al., 2020).

Information

Information is data that has been transformed into a more comprehensible format, facilitating its utilisation by the recipient in present or future decision-making (Bahri et al., 2022; Hafidz et al., 2025).

Classification

Classification is the procedure of evaluating data objects to allocate them to a particular class from a set of possible classes (Caldeira et al., 2022; Primya & Kanagaraj, 2025).

Public

Wildan Khotibul Umam Nasrulloh1, Cahyo Hermanto2, Ikbal Jamaludin3, Lilis Emalia4

Public grievances serve as a vital source of intelligence for governmental entities to rectify existing issues while enhancing and upholding services in alignment with defined standards." (Esperança et al., 2025).

Naive Bayes

Naive Bayes is a basic probabilistic classifier that computes a series of probabilities by aggregating the frequencies and combinations of values from a specified dataset. The approach employs Bayes' theorem and presumes that all attributes are independent or conditionally independent given the values of the class variable (Madyatmadja et al., 2023). Naive Bayes is an algorithm employed in classification methodologies. It utilises a probabilistic and statistical approach created by the English scientist Thomas Bayes, forecasting future probabilities based on historical data, referred to as Bayes' Theorem. This theorem is predicated on the "naive" assumption of independence among attribute conditions. Naive Bayes classification posits that the existence or nonexistence of a particular feature inside a class is independent of the features of other classes (Nai et al., 2023).

The consensus among experts is that Naive Bayes is a classification method grounded in the principles of probability and statistics derived from Bayes' Theorem. This approach computes probabilities by aggregating the frequencies and combinations of values from the supplied data, while presuming that all variables or features within the dataset are mutually independent. Despite the potential interrelation of these variables, the independence assumption is employed to facilitate calculations. Naive Bayes forecasts future probabilities based on prior data experiences, without presuming any interrelations among the variables within the data.

A further issue that emerges is the constraint in evaluating complaint data. Currently, no system exists that can discern patterns and trends from incoming complaints, which could be used for strategic decision-making to improve the quality of public services. Inadequate analysis renders decision-making less focused and not grounded in comprehensive data.

An information system is required to enhance the efficacy of public complaint management. A feasible solution is to implement the Naive Bayes algorithm in the complaint information system. This method can classify data, rendering it appropriate for detecting patterns and trends in incoming complaints.

The development of this information system in Pasirkaliki Village, utilizing the CodeIgniter Framework, aims to enhance the efficiency of public complaint management. This method aims to deliver prompt and precise responses to incoming complaints, hence enhancing community satisfaction with public services.

This research seeks to design and construct a Public Complaint Information System utilising the Naive Bayes technique within the CodeIgniter Framework in Pasirkaliki Village. The study's outcomes are anticipated to enhance the efficiency and effectiveness of managing public complaints, as well as facilitate the development of responsive, high-quality public services.

Research Method

This research will employ a systematic approach to develop a Public Complaint Management Information System to address the challenges of managing public grievances in Pasirkaliki Village. The preliminary stage will entail collecting requirements via interviews and surveys with local community members and public service authorities. This input will determine the precise requirements and expectations for the system, ensuring that it is user-centric and effectively addresses the current inefficiencies and complexities in complaint management.

The subsequent phase of the research will concentrate on the design and implementation of the system utilising the CodeIgniter Framework. The Naive Bayes algorithm will be employed for data classification, enabling the system to examine incoming complaints and discern patterns and trends. The development approach will adhere to Agile techniques, facilitating iterative advancement and ongoing feedback from stakeholders. Consistent testing and validation will guarantee that the system adheres to

Wildan Khotibul Umam Nasrulloh1, Cahyo Hermanto2, Ikbal Jamaludin3, Lilis Emalia4

the necessary performance benchmarks and efficiently prioritises complaints according to urgency.

The research will encompass a deployment phase in which the technology is introduced to the community. Training sessions will be held for public sector personnel and community people to familiarise them with the system's functionalities. The system's efficacy will be assessed using user feedback and performance indicators, with an emphasis on response times and satisfaction levels. The expected results include increased efficiency and precision in complaint management, resulting in enhanced public satisfaction and overall service quality in Pasirkaliki Village.

Result and Discussion
Design Analysis
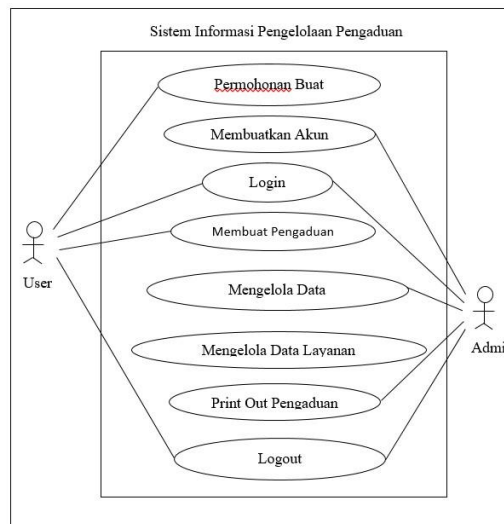
System Design

1) Sequence Diagram Application to Create an Account

Figure 1. Sequence Diagram Application to Create an Account

2) Login Sequence Diagram
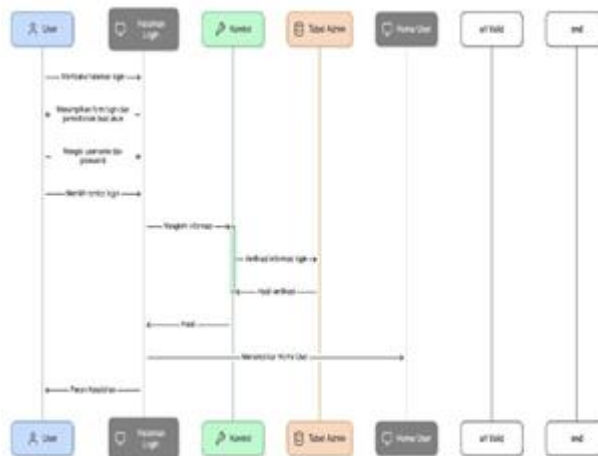
Figure 2. Login Sequence Diagram

3)   Sequence Diagram for Making a Complaint
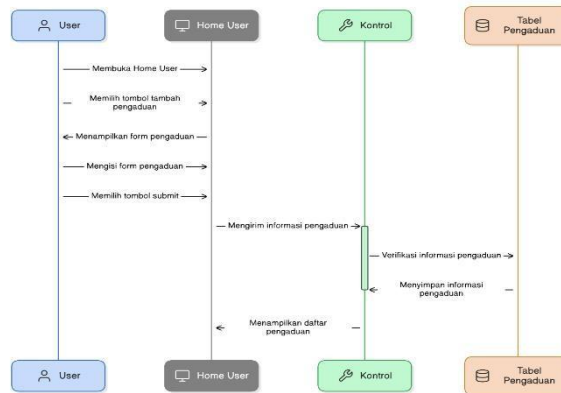
Figure 3. Sequence Diagram for Making a Complaint

4)   Password Change Sequence Diagram
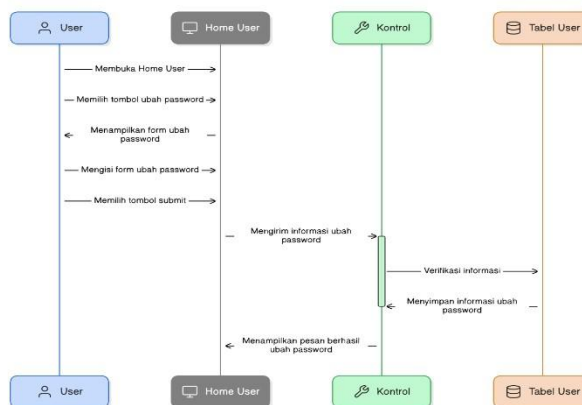
Figure 4. Password Change Sequence Diagram

5)   Logout Sequence Diagram
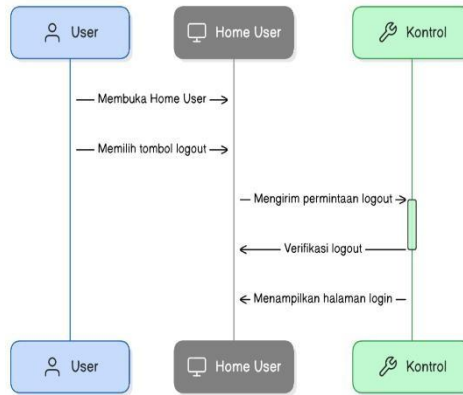
Figure 5. Logout Sequence Diagram

6)   Admin Login Sequence Diagram
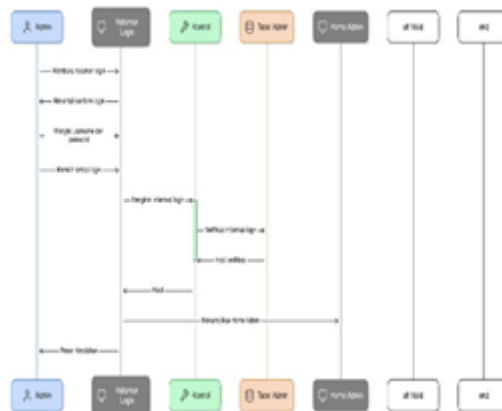
Figure 6. Admin Login Sequence Diagram

7) **Sequence Diagram for Managing Complaints and Creating a New Account**
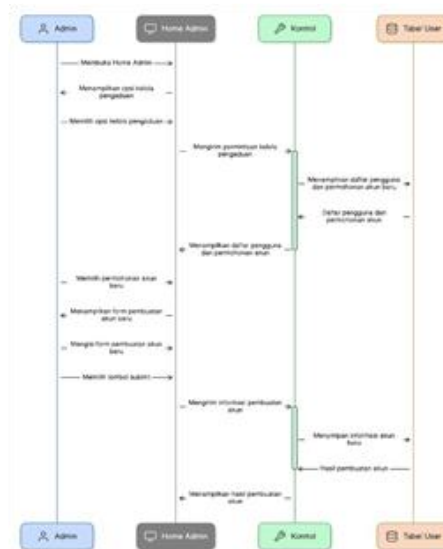
Figure 7. Sequence Diagram for Managing Complaints and Creating a New Account

8) **Sequence Diagram for Managing Complaint List**
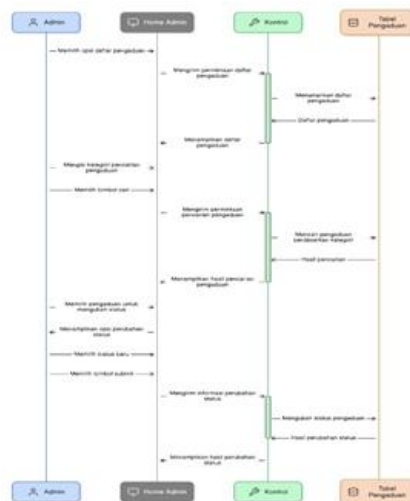
Figure 8. Sequence Diagram for Managing Complaint List

9) Sequence Diagram Print Report
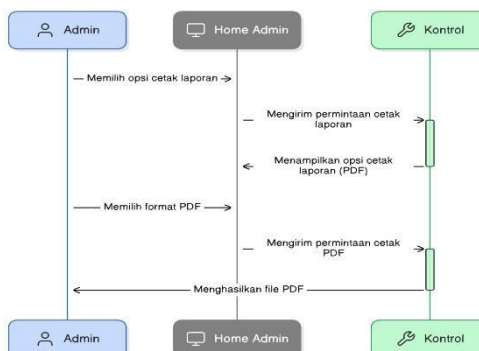
Figure 9. Sequence Diagram Print Report

System Implementation

The implementation step succeeds the interface design process. During this phase, the designed system is executed according to the predetermined specifications. The outcomes of this implementation will thereafter be evaluated to confirm that the system operates as specified and fulfils user requirements. Upon concluding the testing and obtaining favourable findings, the system will be prepared for users.

Figure 10. Login Page Implementation
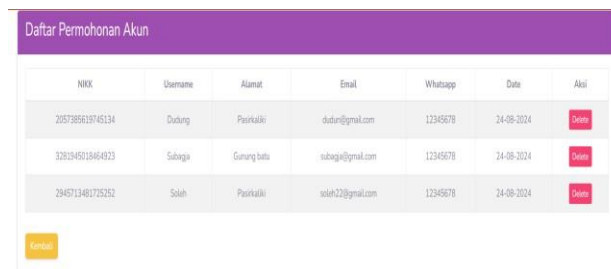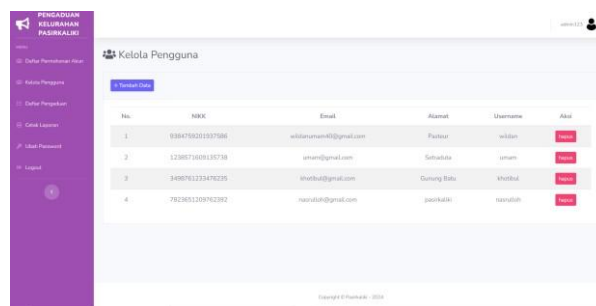
Figure 11. Implementation of the Create Account Request

Figure 12. Implementation of Account Request List

Figure 13. User Management Implementation

Figure 14. Implementation of Complaint Data

Figure 15. Implementation of Print Report

**Figure 16. Implementation of Change Password**
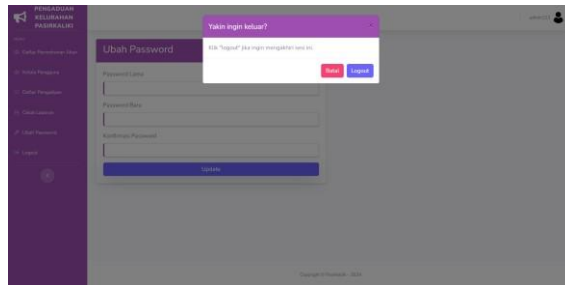
Figure 17. Logout Implementation

Figure 18. Implementation of Add Complaints

Conclusion

Several inferences can be derived from the research results. The public complaint information system in Pasirkaliki Village has been effectively constructed with the Naive Bayes method and the CodeIgniter Framework. This approach efficiently categorises complaints into key areas: Infrastructure, Public Services, Cleanliness, Security, Health, and Education, thereby aiding the village in prioritising complaint resolution. Moreover, the deployment of this technology has markedly enhanced efficiency in managing complaints. The web-based approach facilitates the community's submission of concerns and enables village administrators to monitor and address them more efficiently, overcoming prior accessibility issues. Moreover, the Naive Bayes method utilised in the system yields quite precise classification outcomes for complaints, facilitating data analysis for enhanced

decision-making. Consequently, management can discern patterns in complaints, facilitating proactive measures to improve public services in the future.

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