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Web-Based Neighbourhood Head Performance Information System In Medan Labuhan Sub-District

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ABSTRACT

Performance appraisal of neighborhood heads at the urban village level is often done manually and subjectively, resulting in inaccuracies and unfairness in the evaluation process. This research aims to design and develop a web-based Neighborhood Head Performance Assessment Information System in Medan Labuhan Subdistrict that integrates the Analytical Hierarchy Process (AHP) method. This system was built using the Waterfall method approach and developed with Flutter and Pocketbase technology. Data collection was conducted through in-depth interviews, questionnaires, observations, and documentation studies, which were then analyzed qualitatively and quantitatively using thematic analysis techniques and the System Usability Scale (SUS). The test results show that the system is able to manage criteria data, weighting, candidates, and assessment reports in real-time and efficiently. The system not only improves the objectivity of the assessment, but also supports transparency and community participation in the local governance process. Some suggestions for further development include optimizing backend performance, adding offline mode, and notification features.

Keywords:

Information system, performance appraisal, ward head, AHP, web-based, Flutter, Pocketbase, transparency, efficiency.

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INTRODUCTION

In the era of digital transformation, public administration is increasingly expected to adopt information technology to improve transparency, accountability, and efficiency [1][2]. One of the critical elements in local governance is the performance of neighbourhood heads, who serve as the first point of contact between citizens and government services [3][4]. Neighbourhood heads have a strategic role in bridging communication between the sub-district government and the community at the neighbourhood level. Their duties include implementing development programmes, administrative services, and maintaining neighbourhood security and order[5]. However, in practice, neighbourhood head

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performance evaluations are often conducted manually and subjectively, which can result in inaccuracies and unfairness in the assessment. This can negatively impact work motivation and the effectiveness of public services.

To overcome these problems, a decision support system is needed that is able to provide an objective and structured performance assessment [6]. The Analytical Hierarchy Process method is one of the effective methods in helping decision making by considering various relevant criteria and sub-criteria [7][8]. AHP allows for a more systematic and consistent assessment, thus increasing accuracy in performance evaluation. For example, research by (Deliani, 2025) developed a web-based SPK that integrates the AHP method to assess the performance of hamlet heads in Padang Tualang Subdistrict, which resulted in a more objective and transparent assessment[9].

However, in many sub-districts, including Medan Labuhan, the evaluation and monitoring of neighbourhood head performance still rely heavily on manual processes, which are often time-consuming, lack transparency, and are prone to subjectivity [10][11]. The absence of an integrated system to record and report performance data can hinder effective decision-making by sub-district officials. Furthermore, residents have limited access to information regarding the activities and contributions of their neighbourhood heads, which weakens public participation and trust in local governance [12][13].

The application of web-based SPK also provides convenience in data access and processing, and increases efficiency in the evaluation process. Research by (Ningsih & Sulindawaty, 2021) shows that the use of SPK with the AHP method at the Camat Galang Office can help determine the performance of sub-district officials more accurately and efficiently [14]. Similarly, (Saleh et al., 2020) developed an SPK for employee performance appraisal at the Pinrang Regency Ministry of Religion, which makes it easier for leaders to objectively assess employee performance [15].

To address these challenges, this study proposes the development of a Web-Based Neighbourhood Head Performance Information System for the Medan Labuhan Sub-District. The system is designed to facilitate structured data input, streamline performance evaluation, and provide accessible performance reports for both administrators and the public. By digitizing the assessment process, this system aims to enhance transparency, improve administrative efficiency, and foster greater accountability at the grassroots level.

METHODS.

This study used a mixed methods approach with a development research (R&D) design to design a web-based information system to improve the performance of neighborhood heads in Medan Labuhan Sub-district, with a population of all neighborhood heads and kelurahan staff, and samples were purposively selected to represent villages such as Pekan Labuhan; data were collected through in-depth interviews, Likert scale questionnaires, system usage observations, and document studies, analyzed using thematic techniques for qualitative data and descriptive statistics (mean, percentage) and System Usability Scale (SUS) for quantitative data, with procedures including needs analysis, system design using flutter and pocketbase, prototype testing, and effectiveness evaluation, considering the local context of Medan Labuhan such as limited internet infrastructure and coastal demographic data needs, while ensuring research ethics through informed consent and data confidentiality. The system development method used is Waterfall, which was chosen because of its structured nature and is suitable for projects with clear needs, such as a web-based neighborhood chief assessment system. To give a better understanding of the development process of the inventory information system, the following diagram shows the flow of research steps visually.

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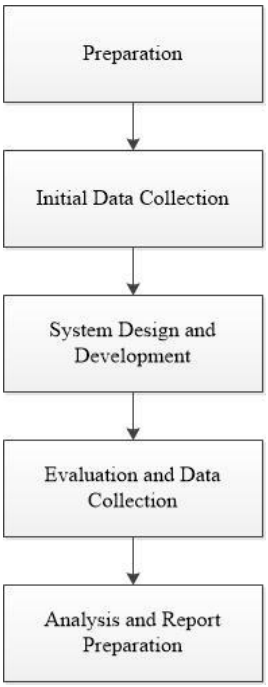

Figure 1. Research Stage

The research stages began with Preparation, which included a literature study on web-based information systems and ward head performance, permit processing, as well as identification of initial system needs in Medan Labuhan Sub-district; followed by Initial Data Collection, involving in-depth interviews with 10-15 ward heads and kelurahan staff and questionnaires to 20-30 residents to map specific needs such as demographic reporting or citizen complaints; then System Design and Development, designing a prototype web-based system using flutter and pocketbase with features that support the duties of ward heads, followed by initial trials in kelurahan such as Pekan Labuhan; followed by Evaluation and Data Collection, measuring the effectiveness of the system through usage observations, satisfaction questionnaires (Likert scale), and System Usability Scale (SUS), as well as interviews to identify barriers such as internet limitations; and ending with Analysis and Report Preparation, processing qualitative data with thematic analysis and quantitative data with descriptive statistics, then compiling a journal report with recommendations such as technology training or infrastructure improvements, while ensuring research ethics through informed consent and data confidentiality.

RESULTS AND DISCUSSION

The results of the implementation and testing of the Web-based Medan Labuhan Neighborhood Head Assessment System with AHP. The user interface was designed to support the needs of users, such as admins, staff, and the public, in managing assessment data, criteria, weighting, and ranking reports. The interface design uses the Flutter framework to ensure a responsive and consistent user experience on web platforms. Each interface element is designed with user-centered design principles, considering ease of use, accessibility, and functionality. The interface includes forms for data input, dashboards for visualization, and reports for analysis of assessment results. The following is a detailed description of each interface element that has been implemented to support the system workflow.

The Registration Form interface allows new users, such as admins or staff, to create an account in the system. This form includes fields such as email, password, and role (Admin or Staff). The design is simple with immediate validation to ensure the email format is valid

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and the password meets the minimum length of 8 characters. The Submit button is only active once all inputs are valid, reducing user errors. The interface uses a responsive layout based on Flutter to support optimal viewing on various screen sizes. This feature supports secure and efficient user access management. Reference: Registration Form Attachment. The Registration Form interface can be seen in Figure 2 below:

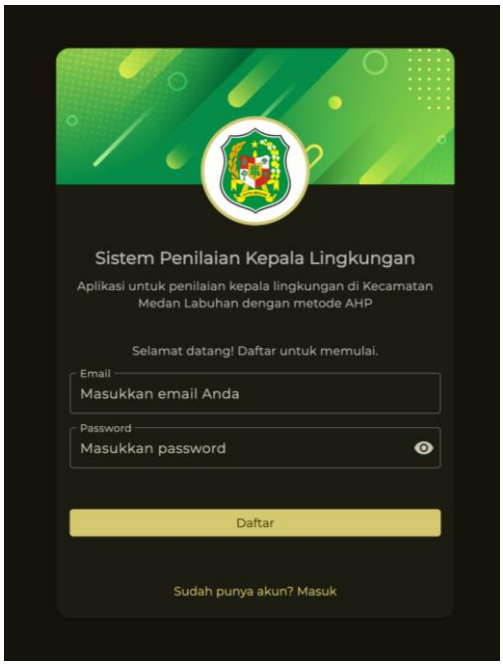

Figure 2. Registration Page

The Login Form interface is used to authenticate users before accessing the system. This form has email and password fields with local validation to ensure the input is not empty. Login Form Attachment. The Login Form interface can be seen in Figure 3 below:

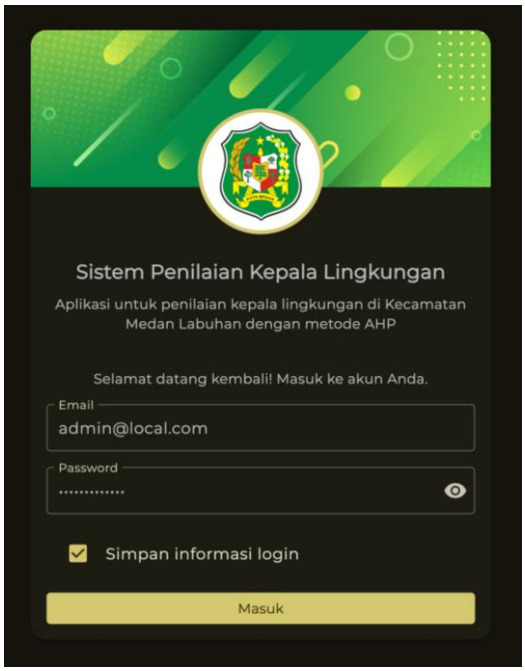

Figure 3. Login Page

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The Dashboard interface serves as the main navigation center after a successful user login. The dashboard displays summary data, such as the number of candidates, criteria, and ranking reports, in the form of visual widgets such as cards and simple graphs. The design uses a grid layout to ensure information is easy to read and access. Dashboard Appendix. The Dashboard interface can be seen in Figure 4 below:

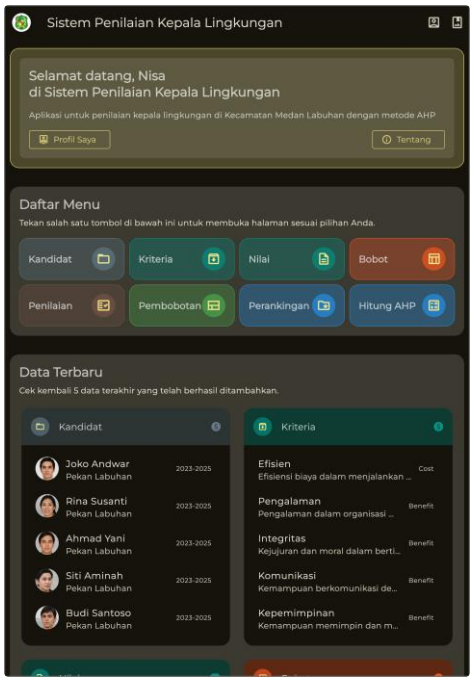

Figure 4. Dashboard Page

The Criteria Form interface allows admins to add or edit assessment criteria, such as integrity or leadership. This interface is designed to make it easier to manage the criteria on which the AHP method is based. Reference: Criteria Form Appendix. The Criteria Form interface can be seen in Figure 5 below:

Figure 5. Criteria Page

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The Weight Form interface is used to input relative weights between criteria based on the AHP method. Weight Form Attachment. The Weight Form interface can be seen in Figure 6 below:

Figure 6. Weight Page

The Candidate Form interface allows admins to add or edit ward head candidate data. Candidate Form Attachment. The Candidate Form interface can be seen in Figure 7 below:

Figure 7. Candidate Page

The Value Form interface is used to enter candidate assessment scores based on criteria. The form includes dropdowns for selecting candidates and criteria, as well as a numeric field for the score. Validation ensures that the values match the rating scale. The design facilitates

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accurate data input for AHP calculations. Value Form Appendix. The Value Form interface can be seen in Figure 8 below:

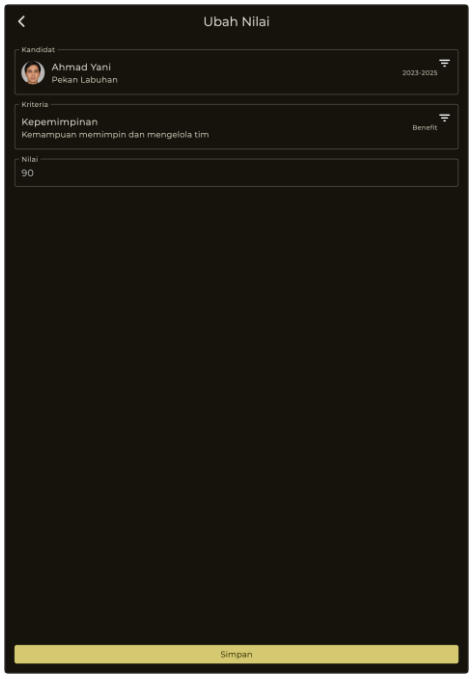

Figure 8. Stock Report Menu

The AHP Calculation Form interface allows the admin to start the AHP calculation process based on weight and value data. AHP Calculation Form Attachment. The AHP Calculation Form interface can be seen in Figure 9 below:

Figure 9. Stock Report Menu

The Weighting List interface displays all weighting data in a table with columns of criteria pairs and weight values. The table supports sorting and filters. This design utilizes Flutter

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for responsive display. Reference: Weighting List Appendix. The Weighting List interface can be seen in Figure 10 below:

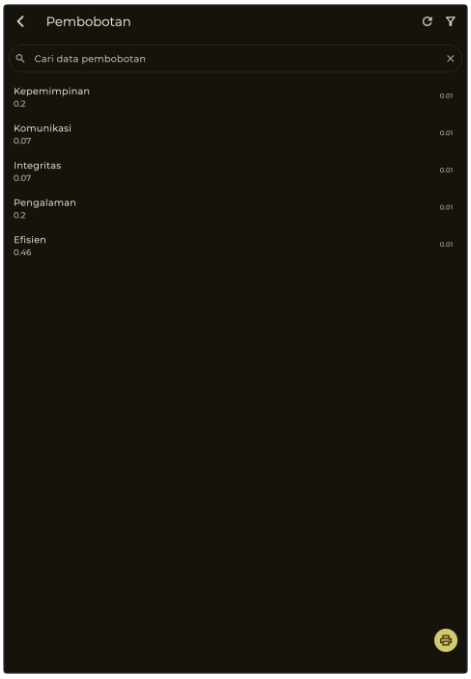

Figure 10. Weighting Page

The Ranking List interface displays the results of ranking candidates based on the AHP method in a table with columns name_candidate and final_scores. Appendix Ranking List. The Ranking List interface can be seen in Figure 11 below:

Figure 11. Rangking Page

The Assessment Report interface presents a summary of all assessments in a format that can be downloaded as a PDF. The report includes a list of candidates, criteria, and scores. The

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design uses Flutter PDF for rendering. Reference: Assessment Report Appendix. The Assessment Report interface can be seen in Figure 12 below:

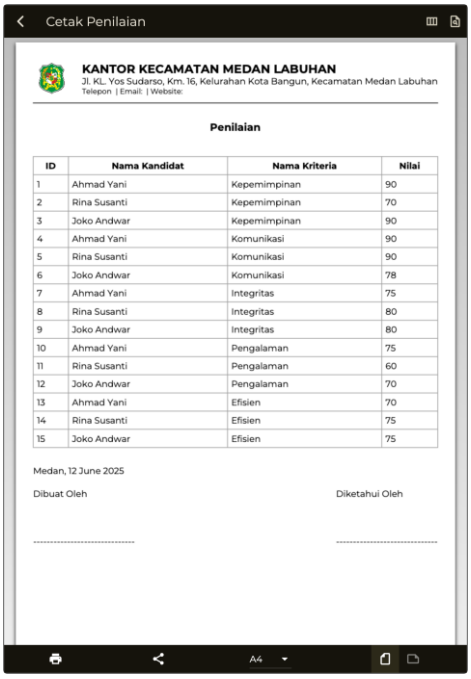

Figure 12. Assessment Report Page

CONCLUSION

This research successfully developed a web-based Medan Labuhan Neighborhood Head Assessment System supported by the Analytical Hierarchy Process (AHP) method to support objective decision making. The system overcomes subjective assessment problems through a structured weighting and ranking process, with key features such as management of criteria, weights, candidates, scores, and reports that have been well implemented. Tests show the system runs with a high success rate, the user interface is responsive and easy to use, and the integration of Flutter and Pocketbase provides optimal performance and data security. In addition, the system is able to produce a ranking report in a clear PDF format and meet the needs of the neighborhood head assessment in Medan Labuhan. Based on the weaknesses found during testing, some suggestions for future system development include optimizing backend performance by implementing caching to handle large datasets, adding offline mode features to support users in areas with limited connections, and improving form validation through clearer visual guidance. In addition, it is recommended to implement data compression to speed up the PDF report export process, as well as adding notification features for important actions to improve overall user experience and interaction.

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