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Designing an Interface for the Garut Police Satbinmas Activity Information System Based on User Centered Design

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ABSTRACT
The development of information technology encourages public agencies to improve the quality of services through the use of more effective digital systems. In the police environment, particularly the Community Development Unit (Satbinmas) of the Garut Police, the process of managing and reporting activities is still carried out semi-manually using Google Spreadsheets, potentially causing data duplication and hindering the recapitulation and monitoring of activities. This condition indicates the need for an information system supported by a user interface that suits the needs of field users. This study aims to design a web-based user interface for the Satbinmas Activity Management Information System of the Garut Police by applying the User-Centered Design (UCD) approach. The research method was carried out iteratively through the stages of observation, user interviews, interface design, and usability evaluation using the System Usability Scale (SUS) involving five Satbinmas personnel. The evaluation results showed an average SUS value of 78.5 which is included in the good category, indicating that the developed interface has an adequate level of usability and is acceptable to users. This study concludes that the application of UCD is able to produce an interface design that supports the efficiency and accuracy of Satbinmas activity management, and provides a contribution in the form of a reference for the development of information system interfaces based on user needs in the regional police environment.

Keywords: Management Information System; Satbinmas; Police; User-Centered Design; System Usability Scale.

INTRODUCTION

Entering the era of information and communication technology (ICT), modernizing operational systems has become an urgent need for all government institutions to improve administrative efficiency, transparency, and accessibility of public services [1]. The digital transformation of the Indonesian government faces various strategic challenges, such as data security issues, limited access to technology in remote areas, and the readiness of human resources to adopt new technologies [2].

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Research shows that the success of digital transformation is highly dependent on policy support, technological readiness, and the ability of human resources to manage change [3]. The digitization process has been proven to have a major impact on improving efficiency, transparency, and work flexibility in government agencies [2]. In the context of public organizations, the implementation of information systems and digital technology needs to be balanced with strategies to strengthen human resources, continuous training, and a user-centered design approach so that public services are more adaptive and productivity increases sustainably.

The Indonesian National Police (Polri) as the main law enforcement institution is required to carry out a comprehensive modernization of its information systems. This transformation not only covers law enforcement aspects but also includes the optimization of administrative processes and performance management in all work units. Research shows that the digitization of police services has significant potential to strengthen public trust, increase user satisfaction, and improve the institution's reputation [4]. At the Resort Police (Polres) level, technology integration is an urgent need given the complexity of tasks and coordination across work units that require an integrated reporting system.

One of the integrated units is the Community Development Unit (Satbinmas), which plays a role in community development and partnership activities through a community policing approach, namely a community-based approach that emphasizes respect for human rights, accountability, and partnership with the community in solving social problems and developing joint solutions [5]. This unit is responsible for building public trust, implementing community character development programs, conducting legal counseling activities for various elements of society, and compiling activity reports as a form of public accountability. However, at the Garut Police Headquarters, the Satbinmas reporting system is still carried out semi-manually using Google Spreadsheets shared via WhatsApp. Although practical, this mechanism poses various obstacles, such as data analysis. duplication, format inconsistency, risk of data loss, and limitations in real-time

Each police station is required to fill out the spreadsheet independently with information such as visual documentation of activities, program implementation descriptions, locations, and activity times. The data is then processed by the Satbinmas team at the police headquarters level to compile a comprehensive report that serves as the basis for analysis, performance evaluation, and ranking between police stations. This condition is in line with the findings that although the police network and is prone to input errors [6], information system excels in data completeness, it still depends on the internet

Based on these issues, this study designed a web-based User Interface for the Satbinmas Polres Garut activity management information system using a User-Centered Design (UCD) approach. This approach places the user as the main focus in every stage of design, from identifying needs, creating solution designs, to evaluating the system using the System Usability Scale (SUS), which is a standard instrument for measuring the usability of web-based information systems [7], [8].

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Unlike previous studies that only focused on conceptual interface design [9], this study fully applied the User-Centered Design (UCD) approach accompanied by LE qualitative analysis of interview results and usability testing using the System Indonesian Usability Scale (SUS). This approach contributes a new interface design model oriented toward the operational context of the Garut Police Community Guidance Unit.

The scientific novelty of this research lies in documenting the application of the User-Centered Design (UCD) approach in the context of regional police work that has special characteristics, such as a tiered reporting structure and limited digital infrastructure. In addition, this study designs an information system interface specifically tailored to the workflow and needs of Satbinmas users by combining qualitative data obtained from in-depth interviews and quantitative data in the form of System Usability Scale (SUS) values as the basis for comprehensive design validation. Practically, the results of this study are expected to serve as a reference in the development of information systems within the Indonesian National Police (Polri) that are more adaptive to the needs of field users and able to minimize resistance to the implementation of new technologies. Test results show that this approach produces an easy-to-use interface and is able to improve the efficiency of activity management, thus contributing both practically and academically to the development of police information systems at the regional level.

METHOD

This research uses a descriptive qualitative approach with a User-Centered Design (UCD) framework as the primary method for designing the system interface. This approach was chosen because it emphasizes direct user involvement in each design stage, ensuring that the design results are aligned with the user's needs and work context. The research process is carried out through four iterative UCD stages: understanding the context of use, specifying user requirements, designing solutions, and evaluating against requirements [10].

Understand the context of use stage. In this stage, researchers conducted two weeks of participatory observation to observe the Satbinmas activity reporting workflow, from receiving report data from the Polsek to recapitulation at the Polres level. Observations focused on personnel interactions with the current Google Spreadsheet system, obstacles encountered, and communication patterns between units. Additionally, interviews were conducted with Satbinmas personnel from the Garut Police Resort directly involved in the activity reporting process to identify workflows, obstacles to using the manual system, and frequently encountered information needs.

The specify user requirements stage aimed to formulate user requirements based on the results of observations and interviews. Interview data was analyzed to identify descriptive user need patterns and generate a list of key functional requirements that the system must meet, including requirements related to ease of inputting Polsek information, managing activity documentation, and report recapitulation.

Design solutions stage. Based on the formulated requirements, researchers translated them into interface designs in the form of interface wireframes using

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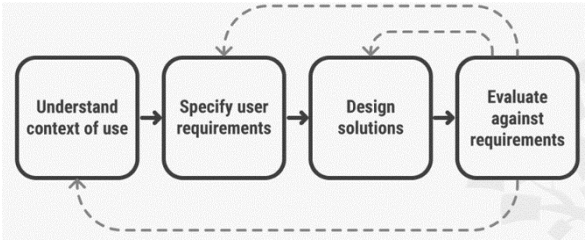
Figma software. The wireframes included a visualization dashboard page, Polsek data input module, report management, and report export features. The low-fidelity prototype was then consulted with two Satbinmas personnel to obtain initial input. The design was developed in stages and evaluated through discussions and direct user feedback to ensure the design met Satbinmas' operational needs.

The evaluation against requirements stage involved usability testing of the system prototype using the System Usability Scale (SUS) instrument. The interactive web-based prototype was tested with the same five personnel using real-life task scenarios, such as inputting/managing police station data, searching for reports within a specific period, and exporting weekly or monthly recaps. After completing the scenarios, respondents completed a System Usability Scale (SUS) questionnaire consisting of 10 statements on a Likert scale of 1–5. SUS scores were calculated using a standard formula ranging from 0–100, with a score of 68 or higher indicating acceptable usability [10]. Additionally, post-test interviews were conducted to elicit qualitative perceptions regarding the interface's strengths and weaknesses.



Picture 1. Stages of the UCD Method
Source: Medium.com

Based on the results of initial testing using the System Usability Scale (SUS) and user feedback, design improvements were made to several interface elements deemed less intuitive. The design process was carried out iteratively twice until the SUS score showed satisfactory results and no further serious issues with system use were identified. Data from interviews and observations were analyzed to identify key problem patterns, while the SUS score was calculated to determine the system's level of usability. The results from the three data sources—observations, interviews, and the SUS—were then compared to ensure accurate and reliable findings. The UCD process was repeated until the interface design fully met user needs. Based on general standards, a SUS score of at least 68 is considered satisfactory [10]. Therefore, this system is expected to simplify administrative and reporting work at the Community Police Unit (Satbinmas).

RESULTS AND DISCUSSION

This research resulted in a web-based interface design for the Garut Police Satbinmas activity management information system, developed using an iterative User-Centered Design (UCD) approach. The design process placed users at the center of development, particularly the admin role responsible for receiving, managing, and summarizing activity reports from each Polsek. The system's primary focus was to simplify administrative processes and improve the speed and clarity of report data access.

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Understand Context of Use

The initial stage of the research was conducted through two weeks of participant observation and interviews with Garut Police Community Service Unit personnel directly involved in managing activity reports from 33 police stations in the Garut region. Observations focused on the daily reporting workflow, from managing report data from the police stations to recapitulation at the police station level.

The observations revealed several critical issues with the existing system. First, each police station sends reports via spreadsheet via WhatsApp, requiring police station administrators to manually open and copy data from three different files each week. This process takes an average of 10-15 minutes per reporting period. Second, administrators must constantly update the date after each data copy and clear the report format for distribution and refilling by each police station the following day. Third, input errors occurred in inappropriate format sections. Interviews with personnel identified priority needs: a centralized system that eliminates separate file submissions, automatic validation to ensure consistent input formats, a visual dashboard that facilitates reporting monitoring, and an automatic export feature for reporting to superiors. These needs formed the basis for formulating the system specifications in the next stage.

Specify User Requirements

Based on the findings from the previous phase, several user requirements were formulated, with an emphasis on the needs of the admin as the primary user of the system. The formulated functional requirements encompassed nine main modules, as listed in Table 1. Highest priority was given to the report reception and dashboard modules, as these two features directly addressed the primary bottlenecks of the legacy system. Functionally, the system was designed to provide a login page, a report summary dashboard, menu navigation, a police station data page, a report management module, a search feature, a police station ranking display, automatic report recapitulation, and a report export feature. All of these functional requirements are summarized in Table 1 and used as the basis for designing the system interface.

Table 1. Functional Requirements

Functional Requirements	Description
Login Page Display (Simulation)	User authentication simulation without data verification functionality.
Dashboard	The interface displays a summary of police station report data in the form of graphs and police station ranking tables.
Menu Navigation	Easy access to all modules.
Police Station Data Page	Provides a concise overview of information related to each police station with CRUD features (static simulation).
Report Management Page	Receives, displays, and stores incoming reports from police stations.

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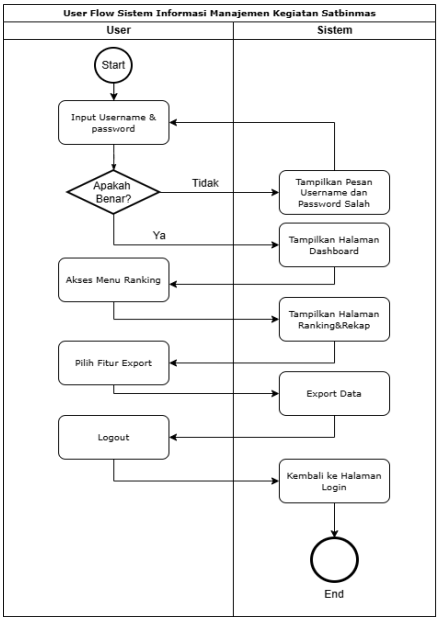
Search Feature	Facilitates users in searching for reports based on keywords.
Police Station Ranking Page (Simulation)	Displays weekly police station rankings (displayed statically).
Automatic Recap Display (Simulation)	Displays report summary results in a visually updated table format (without backend data processing).
Export Feature (Simulation)	Provides a simulated export button (PDF/Excel) to demonstrate the design of the data export function.

The functional requirements formulated at this stage serve as the main reference in the user interface design process at the Design Solution stage. By thoroughly understanding user needs and behavior, the UI design is expected to support Satbinmas administrative and reporting activities in a more efficient and organized manner.

Design Solutions

Based on the established functional requirements, the interface design phase involved developing a simple, consistent, and easy-to-understand design solution. The design solution was developed through three iterations: a low-fidelity wireframe, a high-fidelity mockup, and an interactive prototype. Each iteration involved a review with users to ensure the design aligned with operational needs. The interface design included the login page, main dashboard, report management module, police station data page, search feature, report recapitulation, and data export feature. Before designing the visual interface, a user flow was created that mapped the entire user interaction path from login to logout. This user flow helped ensure that each feature was interconnected and supported the work needs of the Satbinmas admin.



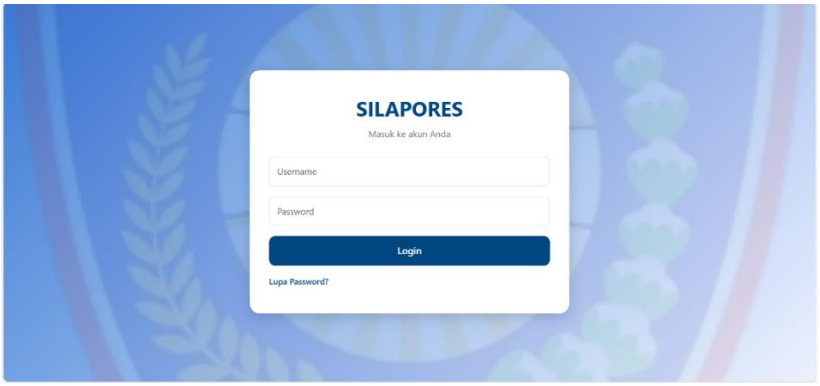
Picture 2. User Flow of the Satbinmas Activity Mangement System

The user flow shows the flow of interactions from login to the receipt and export of activity data, ensuring that each feature is logically connected according to the needs of the Satbinmas admin. Each UI element is designed to reduce potential user errors and speed up the activity data recapitulation process.

Satbinmas Activity Management System User Interface

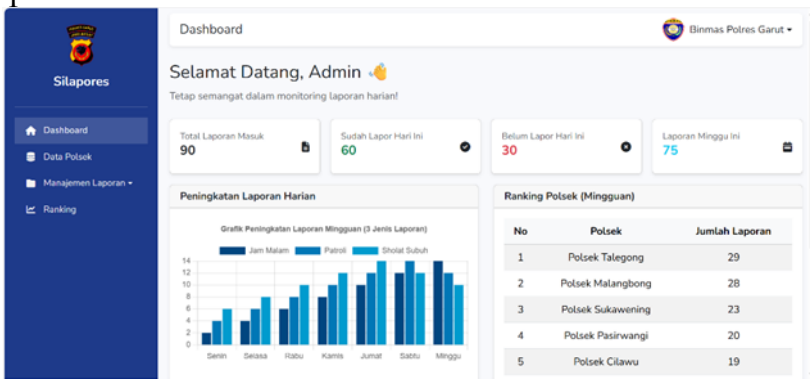
The user interface design is developed based on predetermined user flow and functional requirements. Each interface element is designed to minimize user error, speed up the recapitulation process, and improve information readability.

1. Login Page
   The login page is designed to be minimalist, with only two input fields (username and password) and one action button. The Binmas logo is displayed as a visual background at the top of the form to emphasize the institution's identity.



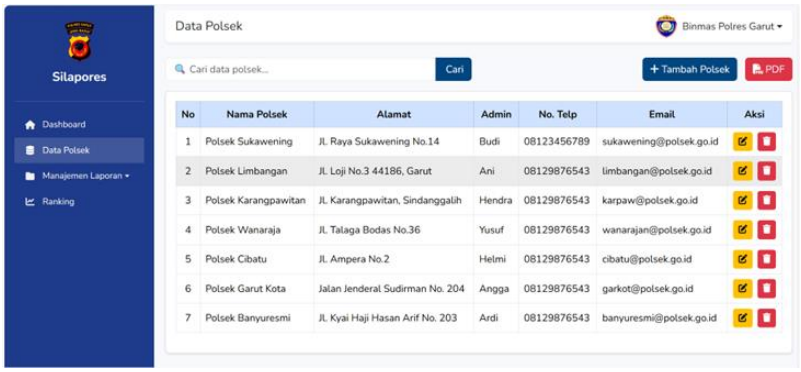
Picture 3. Login Page Display

2. Dashboard Display
   This section displays a summary of key information related to Satbinmas activity reports in real time. This page displays the number of reports in the form of information cards. Furthermore, the dashboard features a graph of daily report increases and a table of Polsek rankings based on the number of reports, making it easier for administrators to monitor reporting performance and conduct quick evaluations.



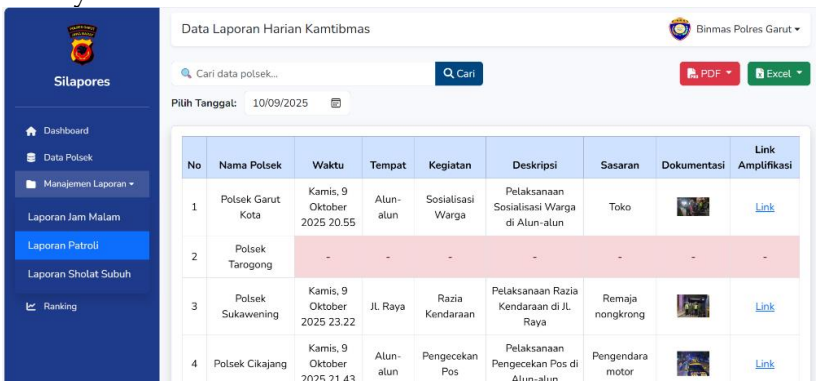
Picture 4. Dashboard Display

3. Police Sector Data Management Menu.
   Police sector data management menu used to display and manage information for each police sector under the Garut Police Department.



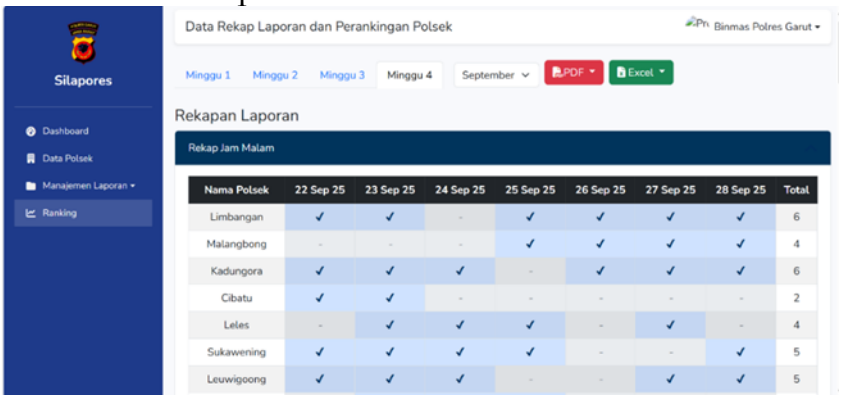
Picture 5. Police Station Data Menu Display

4. Report Mangement Page (Patrol Reports)
   The Report Management Page is used to display and manage patrol activity reports submitted by the police precinct. Search, date selection, and report export features make it easy for admins to monitor, verify, and process report data efficiently.



Picture 6. Report Mangement Page (Patrol Reports)

5. Activity Report Summary Display
   The Report Summary Display presents a summary of each police precinct's activity reports based on a specific time period in tabular form. This page helps admins compare reporting levels between police precincts and supports a quick performance evaluation process.



Picture 7. Activity Report Summary Display

6. Police Station Ranking Page
   The Police Station Rankings page displays the ranking of police stations based on the number of activity reports within a given period. This information is

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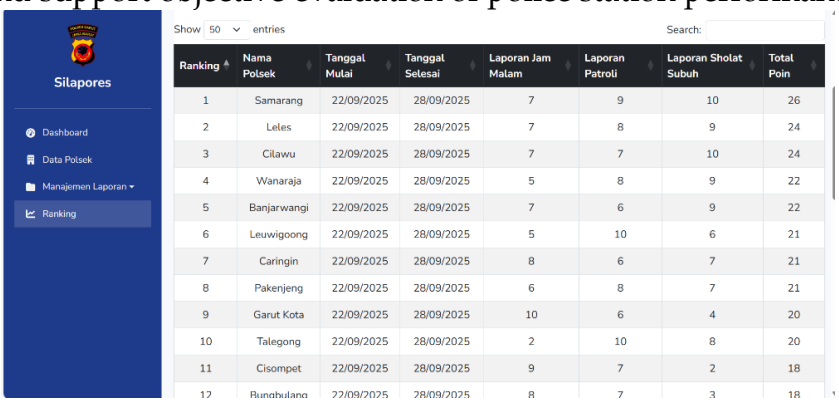
presented in a ranking table to help administrators align reporting activity levels and support objective evaluation of police station performance.



Ranking	Nama Polsek	Tanggal Mulai	Tanggal Selesai	Laporan Jam Malam	Laporan Patroli	Laporan Sholat Subuh	Total Poin
1	Samarang	22/09/2025	28/09/2025	7	9	10	26
2	Leles	22/09/2025	28/09/2025	7	8	9	24
3	Cilawu	22/09/2025	28/09/2025	7	7	10	24
4	Wanaraja	22/09/2025	28/09/2025	5	8	9	22
5	Banjarwangi	22/09/2025	28/09/2025	7	6	9	22
6	Leuwigoong	22/09/2025	28/09/2025	5	10	6	21
7	Caringin	22/09/2025	28/09/2025	8	6	7	21
8	Pakenjeng	22/09/2025	28/09/2025	6	8	7	21
9	Garut Kota	22/09/2025	28/09/2025	10	6	4	20
10	Talegong	22/09/2025	28/09/2025	2	10	8	20
11	Cisompet	22/09/2025	28/09/2025	9	7	2	18
12	Bungbulang	22/09/2025	28/09/2025	8	7	3	18

Picture 8. Police Station Ranking Page

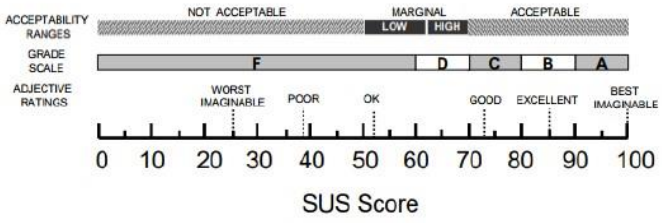
Evaluate Against Requirements

The evaluation phase was conducted using the System Usability Scale (SUS) instrument to assess the usability of the system interface. Testing involved five Satbinmas personnel who were asked to complete a SUS questionnaire after testing the system prototype. The SUS questionnaire consisted of ten statements on a Likert scale of 1–5, and scores were then converted to a range of 0–100 according to standard procedures developed by Brooke [11].

Table 2. SUS Test Results

Respondents	Sus Score
Respondent 1	80
Respondent 2	75
Respondent 3	82,5
Respondent 4	77,5
Respondent 5	77,5
Average	**78,5**

The test results showed an average score of 78.5, exceeding the acceptable usability threshold (68) according to Brooke and above the global SUS average for web applications (68–70). Based on standard interpretation (Figure 9), this score falls into the "Good" category and is at the 80th percentile, indicating a good level of usability.



Picture 9. Interpretation of SUS Score Ranges According to Brooke (1996)

These findings indicate that the interface system is easy to understand, acceptable to users, and has met the criteria for good usability according to usability evaluation standards.

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Discussion

The implementation of User-Centered Design (UCD) has proven effective in improving system usability, as demonstrated by an average SUS score of 78.5 (in the "Good" category), exceeding the standard threshold (68). This result is supported by qualitative findings that users rated the system as easy to navigate, consistent, and informative.

The main contributions of this study consist of three aspects. First, it provides comprehensive documentation of the implementation of UCD in a regional police context. Second, it demonstrates the effectiveness of a combined quantitative (SUS) and qualitative approach in uncovering usability issues that would otherwise be missed by numbers alone. Third, it generates recommendations for priority features based on empirical data, not designer assumptions.

Limitations of this study include: the limited sample size (5 respondents from one police station), the evaluation conducted on a prototype (not a final system with a complete backend), and testing in a controlled environment (not yet in real-world conditions). Further research is recommended for full implementation with real-world data, a long-term adoption study, and expansion of the evaluation to other regional Satbinmas units.

CONCLUSION

This research successfully designed an interface for the Garut Police Satbinmas activity management information system that addresses issues with the legacy system, such as a 10-15 minute manual recapitulation process, data duplication from three separate spreadsheet files, and inconsistent report formats. The application of User-Centered Design (UCD) resulted in a system with the potential for time efficiency of less than 10 minutes per recapitulation period.

The contributions of this research include providing a complete implementation model for the UCD cycle in a regional police context, validating the effectiveness of a combination of quantitative and qualitative methods in identifying usability issues, and identifying four priority features based on empirical needs: real-time report management, a visualization dashboard, police station data management, and report recapitulation export.

Further research should focus on developing a functional system with database and API integration, evaluating long-term adoption using the Technology Acceptance Model, and developing a machine learning-based predictive analytics module.

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