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Workload Analysis System Optimization through the Integration of an Interactive Dashboard

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ABSTRACT

In the era of digital transformation and bureaucratic reform, optimizing organizational performance in police institutions demands effective workload management. Workload analysis (Analisis Beban Kerja/ABK) is essential for ensuring fair task distribution that aligns with personnel capacity and competence. The Community Development Unit (Binmas) of the South Sumatra Regional Police plays a pivotal role in building public trust and cooperation. However, the absence of an integrated system to analyze workload distribution has resulted in potential inefficiencies, imbalanced task assignments, and increased work stress. Recent findings highlight a significant link between workload and stress levels among police personnel, emphasizing the urgency of system optimization. This study proposes the integration of an interactive dashboard to enhance the effectiveness of workload analysis in the Binmas Unit. Drawing on successful implementations such as the e-dikbangspes system and SI-ABK Precision application, the research underscores how dashboard technology can streamline data access, improve staffing decisions, and support the development of a more responsive organizational structure. By focusing on the Binmas Unit, this study aims to close the existing technological gap and contribute to improved personnel management and institutional performance through digital innovation in workload monitoring.

1. Introduction

In today's era of digital transformation and bureaucratic modernization, police institutions are expected to improve the efficiency and effectiveness of their operations. One key factor that directly impacts organizational performance is how personnel workloads are managed [1]. Workload analysis, or Analisis Beban Kerja (ABK), serves as a vital tool for assessing and evaluating how tasks are distributed, ensuring that each officer is assigned responsibilities in line with their capacity and skillset.

The Community Development Unit (Binmas) of the South Sumatra Regional Police plays a strategic role in fostering collaboration between law enforcement and the public. However, the lack of an integrated dashboard system to monitor and analyze the workload of Binmas personnel has led to uneven task

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distribution. This imbalance can result in reduced performance and heightened job-related stress. Supporting this concern, study by some researcher found a significant correlation between workload and work stress among officers in the South Sumatra Police Traffic Directorate, with a determination coefficient of 40.2%.

With the ongoing advancement of information technology, the integration of a dashboard-based system into workload management offers a promising solution. For instance, Arribe et al. (2023) developed a web-based e-dikbangspes application for the Human Resources Bureau of the South Sumatra Police [2], enabling efficient online access to education and training data, regardless of time or location. This system streamlines the process of data collection and management. Elsewhere, similar initiatives have been implemented in various government sectors. Afan & Su'ud (2022) [3], for example, examined the adoption of a workload analysis website in the Public Works, Housing, and Energy Resources Office. Their study emphasized the need to align staffing levels with organizational demands and to refine job classifications accordingly.

Within the South Sumatra Regional Police, the SI-ABK Precision application plays an important role in organizing the Personnel List (DSP) for each unit, contributing to the development of a more efficient and well-structured police organization. However, despite these advances, the Binmas Unit has yet to fully implement a dedicated system tailored to its specific workload analysis needs. This gap has inspired our study focus: exploring how to optimize workload analysis within the Binmas Unit by integrating an interactive and responsive dashboard system.

2. Method

By following this SDLC process (Figure 1) [4]-[7], the system was developed in a structured and reliable way, ensuring that the final solution not only met technical specifications but also genuinely improved the way workload data was understood and acted upon.

Figure 1. SDLC Process

SDLC process explanation:

1. *Planning*

This phase involved understanding the main objective: optimizing workload analysis through an interactive dashboard. Stakeholders were identified, goals were set, and requirements were outlined, such as the need to streamline data visualization and make workload assessments more efficient and actionable.

2. *Analysis*

In this step, the team carefully analyzed the current system and pinpointed bottlenecks or inefficiencies in how workload data was being collected and interpreted. Functional and non-functional requirements for the dashboard were defined, ensuring the system would be user-friendly, real-time, and scalable [8]-[10].

3. *Design*

Here, the system architecture was designed, including the layout of the dashboard interface, the structure of the backend logic for workload analysis, and how data would be displayed to different user roles (Admin, Manager, User) [11],[12]. This blueprint ensured that the final product would be intuitive and effective for decision-making.

4. *Implementation*

The development team started coding the system components, integrating workload algorithms with the dashboard interface. This phase also involved configuring database connections and building the user access controls as planned during the design.

5. *Testing & Integration*

Once the dashboard was functional, rigorous testing was carried out. This included unit testing, system integration, and user acceptance testing to ensure that the workload analytics worked accurately and the interface responded smoothly across different devices and scenarios [13]-[15].

6. *Maintenance*

After deployment, the system entered the maintenance phase. Feedback from users was continuously gathered to fix bugs, improve dashboard usability, and update features as workload dynamics evolved [16]-[18].

3. Result and Discussion

Figure 2 shows the use case diagram of the proposed system. The use case diagram above illustrates a workload management system involving three main actors: User, Admin, and Manager. All three actors can access the system through the Login process, and new users can register using the Registration feature. Once logged in, each actor can perform specific actions based on their role. The diagram also shows that the login process is a prerequisite for accessing other system functions, and all actors can log out using the Logout use case once their tasks are complete. In this system, the Admin has special privileges, including the ability to Input Activity Data, which is later processed through the Workload Analysis function. The Admin can also view the results via View Workload Report and print the outcomes using Print Report. Regular Users can also input activity data, contribute to the workload analysis process, and have access to view and print the reports—indicating their active involvement in the day-to-day operations of the system.

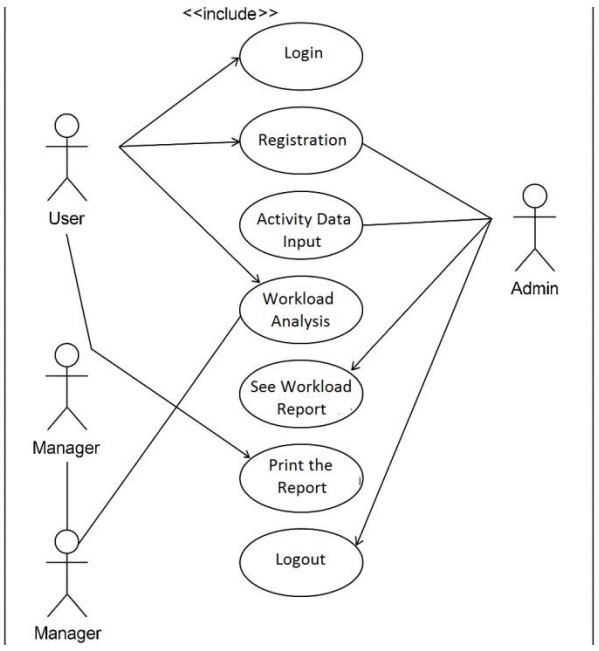

Figure 2. Use Case Diagram

Figure 3 shows the class diagram of the proposed system.

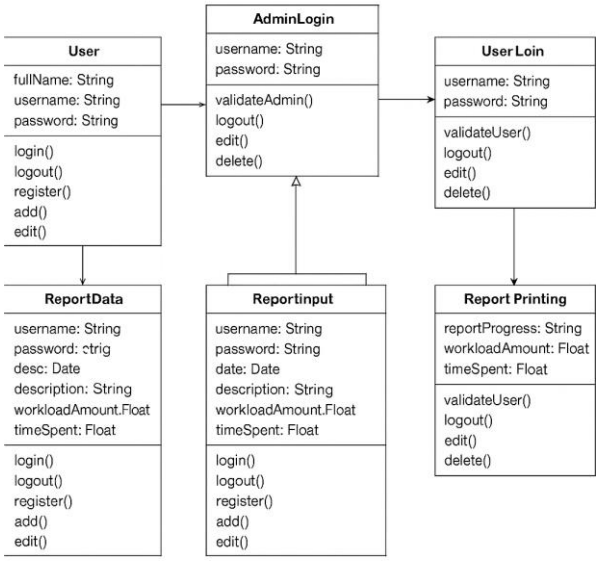

Figure 3. Class Diagram

This class diagram represents the structure of a Workload Analysis and Reporting System, capturing how different parts of the system interact with each other using object-oriented design principles. At the core is the User class, which holds essential user information like full name, username, password, and email. It also contains basic functionalities such as login, logout, registration, adding data, and editing user information. This class serves as the gateway into the system, allowing both regular users and admins to authenticate and begin their respective tasks.

Branching from the User class, we see two specific login classes: AdminLogin and UserLogin. These classes handle the validation process for their respective user types. Each includes methods like validateAdmin() or validateUser(), and options to logout, edit credentials, or delete accounts. This separation ensures role-based access control—Admins can manage broader system functions, while regular users are limited to submitting and managing their own data. The design improves both security and accountability within the application.

Moving deeper into functionality, we have three report-related classes: ReportData, ReportInput, and ReportSummary (or ReportRecap in the original diagram). Although they contain similar attributes—such as username, date, description, workload amount, and time spent—they likely serve distinct purposes. For instance, *ReportInput* may capture raw activity logs, *ReportData* could be used for storing processed records, and *ReportSummary* might focus on aggregated insights. All three support operations such as logging in, logging out, adding entries, and editing reports, ensuring users can manage their workload efficiently across different stages.

Finally, the ReportPrinting class stands out as a utility for finalizing reports. It includes attributes like report progress, workload amount, and time spent—possibly used for generating visual dashboards or printable documents. The methods in this class are geared toward output control, such as validating the user, editing print preferences, logging out, or deleting report data. Altogether, this diagram reflects a well-structured and modular system that cleanly separates user roles, streamlines workload data input and analysis, and provides a polished reporting output—exactly what's needed for an optimized and user-friendly workload analysis system.

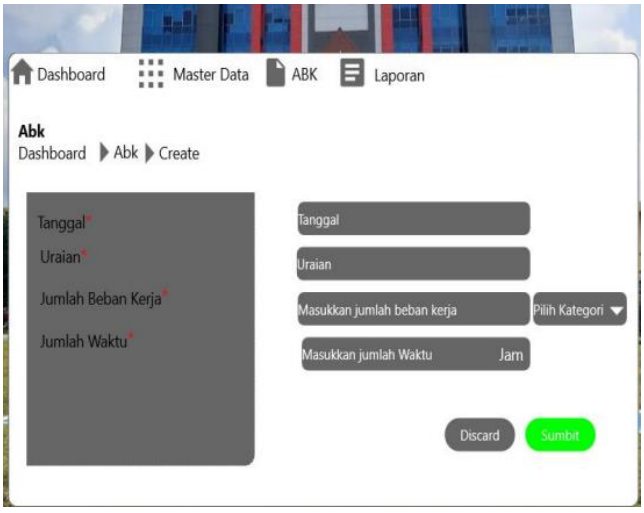

Figure 4. Interface Design

Figure 4 represents the Workload Analysis page interface for users, where they can complete their personal information in the provided Workload Analysis form on the website. Users—specifically personnel from Binmas Polda South Sumatra—can add workload entries according to their tasks or preferences. Once all the required fields are filled in, users can click the submit button to save their workload analysis data. The next section presents the interface design of the Workload Analysis Data page.

5. Conclusion

In the context of public service modernization, particularly within police institutions like Binmas of the South Sumatra Regional Police, the optimization of workload analysis is essential for promoting balanced task distribution and improving overall performance. This study has highlighted how the integration of an interactive, dashboard-based system can address the inefficiencies in traditional workload management. By providing real-time access to personnel workload data, the system supports better decision-making, improves transparency, and fosters a healthier work environment for officers. Drawing on both technological advancements and user-centered design, the proposed solution aligns with institutional goals of increasing operational effectiveness while reducing work-related stress.

The system's development followed the structured phases of the Software Development Life Cycle (SDLC), ensuring that each stage—planning, analysis, design, implementation, testing, and maintenance—was aligned with the functional needs of Binmas personnel. From gathering requirements to designing a user-friendly dashboard interface, the project focused on creating a solution that is both technically sound and practically valuable. The class and use case diagrams demonstrate a modular and scalable system architecture that clearly separates user roles (Admin, User, Manager), enables secure authentication, and supports key operations such as workload input, report viewing, and data printing. This object-oriented structure enhances maintainability and allows for future system expansion. The inclusion of visual interface designs further illustrates how users can interact with the system intuitively. Whether inputting activity data or reviewing workload summaries, users are empowered to manage their responsibilities more effectively. The interface also reflects an understanding of the practical workflows within Binmas, ensuring relevance and usability. Overall, the study showcases how thoughtful system design—supported by modern technology—can transform routine administrative tasks into streamlined, data-driven processes. It lays the groundwork for future enhancements in workload analysis systems across similar government institutions, ultimately contributing to smarter governance and more efficient public service delivery.

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