

Implementation of a Real-Time Leadership Schedule Dashboard for Government Agenda Monitoring

Usman Arfan¹, Anjarwati^{2*}

^{1,2}Informatics Study Program, STMIK Pesat Nabire, Indonesia

Jl. Poros Samabusa, Sanoba, Kabupaten Nabire, Papua Tengah 98816, Indonesia

¹usmanarfanpesat@gmail.com, ^{2*}anjarwati.091001@gmail.com



*Corresponding Author:

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ABSTRACT

Background: Government institutions require an effective medium for delivering leadership agenda updates quickly, centrally, and transparently. At the Government of Central Papua Province, executive schedule information was previously distributed through messaging applications and internal documents, which made uniform and real-time monitoring difficult for relevant staff. **Objective:** This study aims to implement a web-based leadership schedule dashboard that supports agenda monitoring through information displays in the governor's office. **Methods:** The system was developed using the Prototype method through needs analysis, system design, implementation, black-box testing, and deployment. The application uses HTML, CSS, and JavaScript, is hosted through Hostinger for centralized access, and is connected to display monitors through a computer device. **Results:** The implemented dashboard presents the leadership agenda, date, real-time clock, weather information, and running text in a single interface. Operators can add, update, delete, filter, and export schedule data and configure display settings. Black-box testing of 22 scenarios produced valid results for all tested functions, including operator access, schedule management, periodic data updates, and monitor display. **Conclusion:** The system improves government agenda monitoring by providing centralized, accessible, and real-time executive schedule information. It supports internal coordination and reduces dependence on fragmented message-based schedule distribution. The monitor-based presentation also enables relevant staff to access current information directly in designated work areas.

INTRODUCTION

Managing leadership agendas is essential in government institutions, particularly for coordination meetings, hearings, official meetings, working visits, and other administrative activities. Leadership schedule information must be communicated promptly, systematically, and in a form that relevant personnel can easily monitor so that activities can be carried out effectively. Delays in distributing agenda information may disrupt coordination among organizational units, protocol readiness, and administrative support for leaders.

At the Government of Central Papua Province, the need for a leadership schedule information system arose because meeting and agenda information had been distributed through documents and internal communication channels that were not consistently integrated into a single display. Consequently, relevant personnel could not monitor agenda information uniformly. According to the system development Terms of Reference, a dashboard was required to present the governor's meetings and agendas clearly and systematically for leaders and relevant organizational units.

Based on these problems, this study aims to implement a web-based leadership schedule dashboard for the Government of Central Papua Province. The system presents leadership agenda information in real time, provides an operator page for managing schedule data, and displays information on monitors in meeting rooms or work areas that require access to the schedule. The application was developed using HTML, CSS, and JavaScript and deployed through a hosting service to enable centralized access and updates.

This study contributes a leadership schedule dashboard that provides a structured and readily monitored medium for government agenda monitoring. The system supports internal coordination, accelerates schedule communication, and reduces dependence on distributing agenda information through separate messages or documents.

LITERATURE REVIEW

A dashboard is a visual medium that integrates essential information into a single view so that current conditions can be monitored quickly. Structured design patterns help users recognize information priorities and reduce visual complexity (Bach et al., 2023; Setlur et al., 2024). Textual components also provide context, navigation cues, and a reading sequence in interactive dashboards (Sultanum & Setlur, 2025). Interactive guidance can progressively help users understand dashboard functions and content (Hoque & Sultanum, 2025), while appropriate information



integration supports comprehension in time-critical situations (Patel et al., 2024).

Dashboard applications across various domains demonstrate their value for monitoring and situational awareness. Dashboards have been used for urban traffic monitoring (Bachechi et al., 2022), cybersecurity (Chung et al., 2023), near-real-time vaccine safety surveillance (Kenigsberg et al., 2022), wearable-device data for healthcare professionals (Sadhu et al., 2023), and organizational process monitoring (Zhang et al., 2022). Systematic reviews also emphasize the importance of user requirements and usability evaluation in dashboard development (Schulze et al., 2023; Strechen et al., 2024). At the leadership level, dashboards can support the presentation of data for policy and decision-making (Curran et al., 2024). However, a leadership schedule dashboard deployed in a regional government environment must be adapted to institutional workflows, operator-managed agendas, periodic information updates, display settings, and monitor-based presentation.

METHOD

This study used the Prototype method to develop the leadership schedule dashboard. This method was selected because prototyping supports requirements validation through an initial design that can be developed and refined iteratively (Yang et al., 2020). The system was developed according to operational needs in the Government of Central Papua Province through requirements analysis, design, implementation, testing, and deployment.

Data Collection

Research data were obtained through document review, implementation documentation, and direct system testing. The document review examined the Terms of Reference (TOR) for developing the Governor's Meeting List Dashboard System for Central Papua Province. The document was used to identify the background, objectives, scope, agenda information structure, expected outputs, technologies, and development stages. The findings were then mapped into functional requirements covering schedule presentation, operator-based agenda management, supporting information, data updates, and dashboard presentation on a monitor.

Implementation data were obtained from application interface documentation and from deploying the dashboard on a computer connected to a monitor in the governor's office. Testing data were collected through black-box testing of 22 scenarios covering the home page, date and time, weather, running text, operator access and login, agenda management, display settings, full-screen mode, periodic data updates, monitor presentation, and data export. For each scenario, the actual output was compared with the expected result. A feature was considered valid when its output matched the specified function.

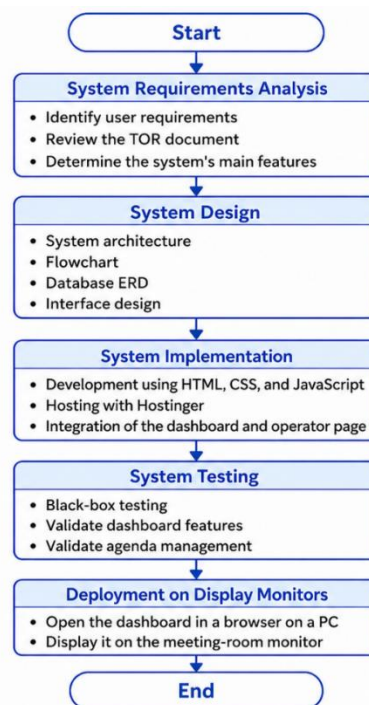


Figure 1. Research methodology flow

System Requirements Analysis

The initial stage analyzed system requirements based on existing leadership agenda management practices. According to the Terms of Reference, the system had to present the governor's meetings and agendas clearly, systematically, and in an easily monitored format. Agenda information had previously been distributed through



documents or internal communication that was not consistently integrated into one display. The dashboard was therefore developed to present leadership agenda information in real time on a designated monitor.

The primary requirements included presenting leadership schedules on the main dashboard, providing an operator page for agenda management, showing the date, time, weather, and running text, configuring the dashboard display, presenting schedules on a monitor, and updating data periodically.

System Design

The system was designed by developing its architecture, flowchart, and Entity Relationship Diagram (ERD). The architecture describes the workflow from operator input to information presentation on the display monitor. The home page was designed as a publicly visible information dashboard, while the operator page is accessed through the Central Papua Provincial Government logo, which functions as a concealed button. This mechanism keeps the dashboard uncluttered and focused on information presentation.

The general workflow begins when an operator accesses the login page, manages agenda data through the administration page, and saves the data in system storage. The dashboard then reads the latest data and displays it on the monitor. The flowchart describes the system workflow, while the ERD represents the data structure comprising users, activity schedules, and display settings.

System Implementation

The leadership schedule dashboard was developed using HTML, CSS, and JavaScript. Its home page presents leadership activities, other agendas, the date, a real-time clock, weather information, and running text. The footer displays scrolling information to reinforce message delivery on the monitor.

Operators access the management interface through the Central Papua Provincial Government logo on the dashboard. The system detects a mouse click or the Enter or Space key on the logo and then directs the user to the login page. This mechanism preserves the home page as an information display while providing operators with access to agenda management.

Schedule updates are executed through the `loadData()` function. The system first reads stored schedule data; if no data are available, it retrieves data from the source file, normalizes the schedule structure, stores it, and applies it to the dashboard. The process is called periodically using `setInterval()`, enabling the latest information to appear without manually reloading the display page.

System Testing

The system was evaluated using black-box testing, which assesses behavior through inputs and outputs without relying on the program's internal structure (Dashti & Basin, 2020). Testing focused on the dashboard, operator access and login, agenda management, display settings, periodic data updates, full-screen presentation, data export, and dashboard presentation on a monitor.

Test scenarios were prepared according to the functions available in the system. Each feature was tested using a defined input, and the resulting system output was compared with the expected result. A feature was considered valid when the observed result matched the predefined scenario.

Deployment on Display Monitors

The system was deployed by presenting the leadership schedule dashboard on a display monitor in the governor's office. The dashboard was opened in a browser on a computer connected to a meeting-room monitor. This configuration enables leadership schedule information to be displayed directly and monitored by employees and other relevant personnel.

This deployment stage verified that the dashboard functioned not only on the development device but also in the actual workplace. The display monitor enables leadership agenda information to be presented centrally, viewed easily, and updated periodically according to data managed by the operator.

RESULT

This study produced a web-based leadership schedule dashboard for presenting real-time leadership agenda information within the Government of Central Papua Province. The system comprises a dashboard home page, an operator login page, an administration panel, agenda management features, display settings, and deployment on a meeting-room monitor. The results are presented according to the system design, interface implementation, monitor deployment, and system testing.

System Architecture

The system architecture connects schedule input by the operator with dashboard presentation on the display monitor. The workflow begins when an administrator or operator enters and updates schedules through the administration page. The dashboard then reads the stored data and presents them in a browser on a computer connected



to the display monitor.

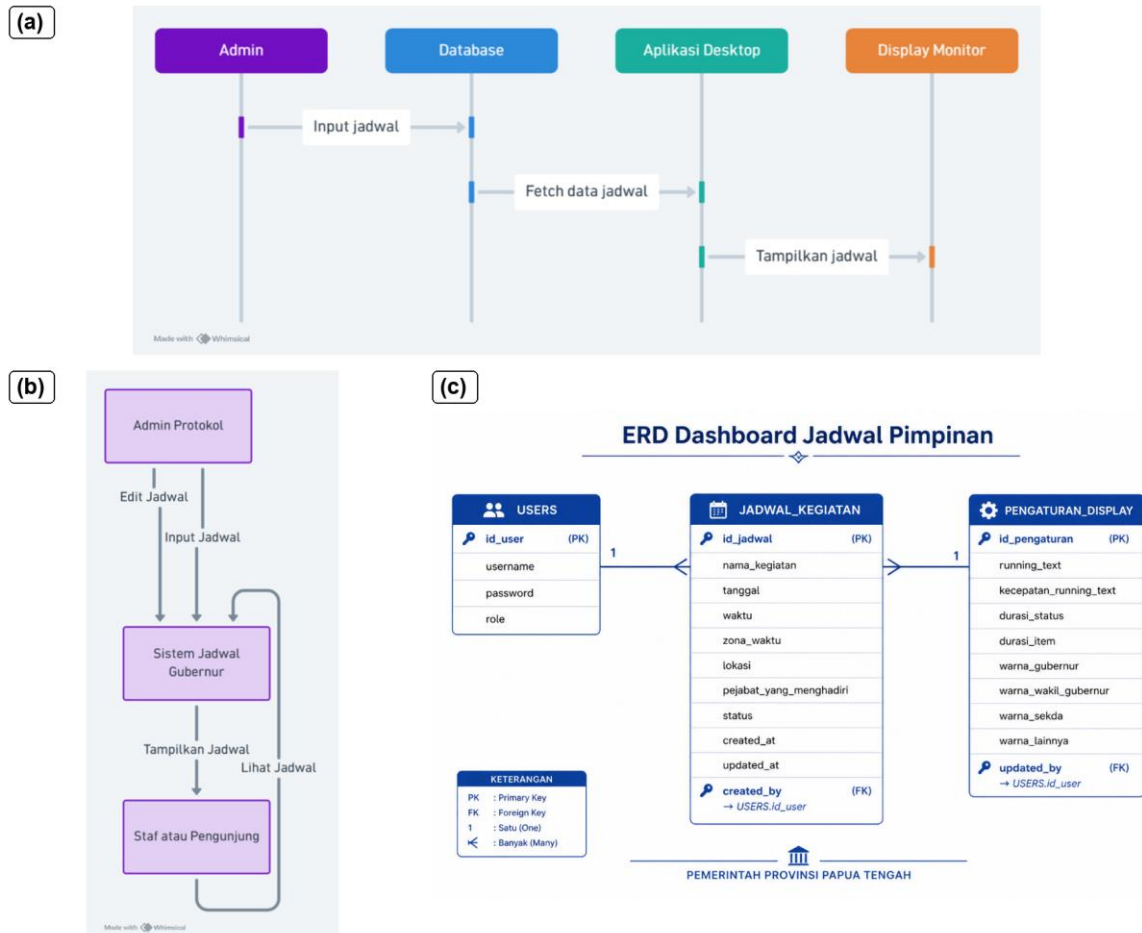


Figure 2. System design: (a) system architecture; (b) flowchart; (c) Entity Relationship Diagram

Figure 2(a) shows the main workflow from the operator and data storage to the web dashboard, computer, and display monitor. This architecture enables leadership schedule information to be updated centrally and presented on the monitor. Consequently, agenda information does not need to be repeatedly distributed through separate messages or documents because users can view schedule updates directly on the dashboard.

System Flowchart

The system flowchart describes the main workflow of the leadership schedule dashboard. The home page immediately presents the dashboard on the display monitor. The operator page is accessed through the Central Papua Provincial Government logo, which functions as a concealed button. Selecting the logo opens the login page, after which an authenticated operator can manage agendas and display settings.

Figure 2(b) shows that the main processes comprise dashboard access, operator access, login validation, agenda management, data storage, retrieval of the latest data, and information presentation on the display monitor. The flowchart demonstrates that the system serves not only as an information page but also as an operator-managed data platform.

Database Design

The database was designed to store operator data, activity schedules, and dashboard display settings. It comprises three main entities: **USERS**, **ACTIVITY_SCHEDULES**, and **DISPLAY_SETTINGS**.

Figure 2(c) presents the system's data relationships. The **USERS** table stores operators authorized to access the administration page. The **ACTIVITY_SCHEDULES** table stores leadership agenda information, including the activity name, date, time, time zone, location, attending official, status, and data creation and update times. The **DISPLAY_SETTINGS** table stores dashboard configuration data, including running text, scrolling speed, display duration, and agenda category colors.

The principal relationships connect **USERS** with **ACTIVITY_SCHEDULES** and **DISPLAY_SETTINGS**, indicating that system operators update agenda data and display configurations. This database design supports

centralized schedule management and enables the dashboard to retrieve the latest data for monitor presentation.

Dashboard Home Page Implementation

The dashboard home page was designed as an information interface for presentation on a display monitor. It shows the dashboard title, Central Papua Provincial Government logo, date, real-time clock, weather information, today's agenda, other agendas, and running text at the bottom of the screen.

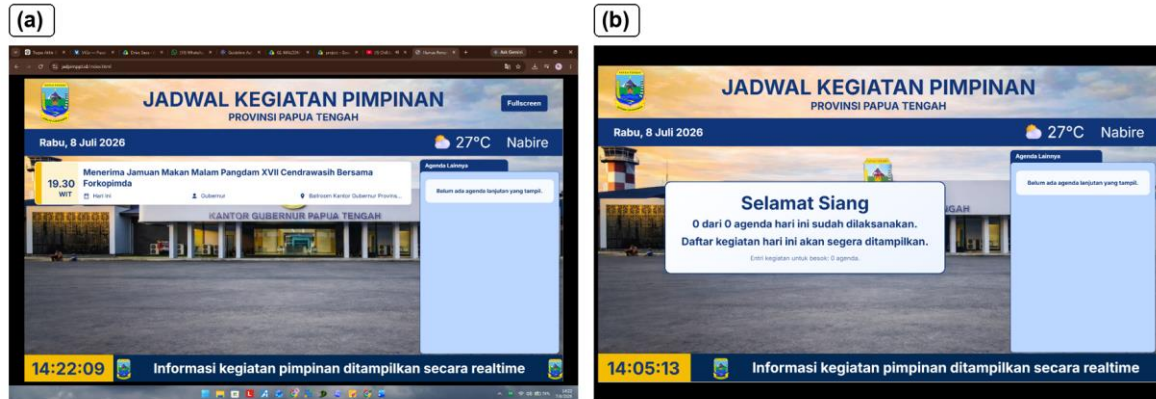


Figure 3. Dashboard states: (a) agenda display; (b) display when no agenda is available

Figure 3(a) shows the dashboard while leadership agenda information is available. The interface is scaled for a display monitor so that the information remains legible. Its main components include activity schedules, event times, attending officials, locations, other agendas, and scrolling information.

The dashboard also provides a status view when no agenda exists for the current date. This view informs users that an activity list is not yet available or that no subsequent agenda is scheduled.

Figure 3(b) shows that the system continues to inform users when no agenda data are available. This prevents the monitor from displaying a blank page and keeps users aware of the current day's schedule status.

Operator and Administration Page Implementation

The operator page is used to manage leadership agenda data. It is accessed through the Central Papua Provincial Government logo on the dashboard home page. Selecting the logo opens the login page.

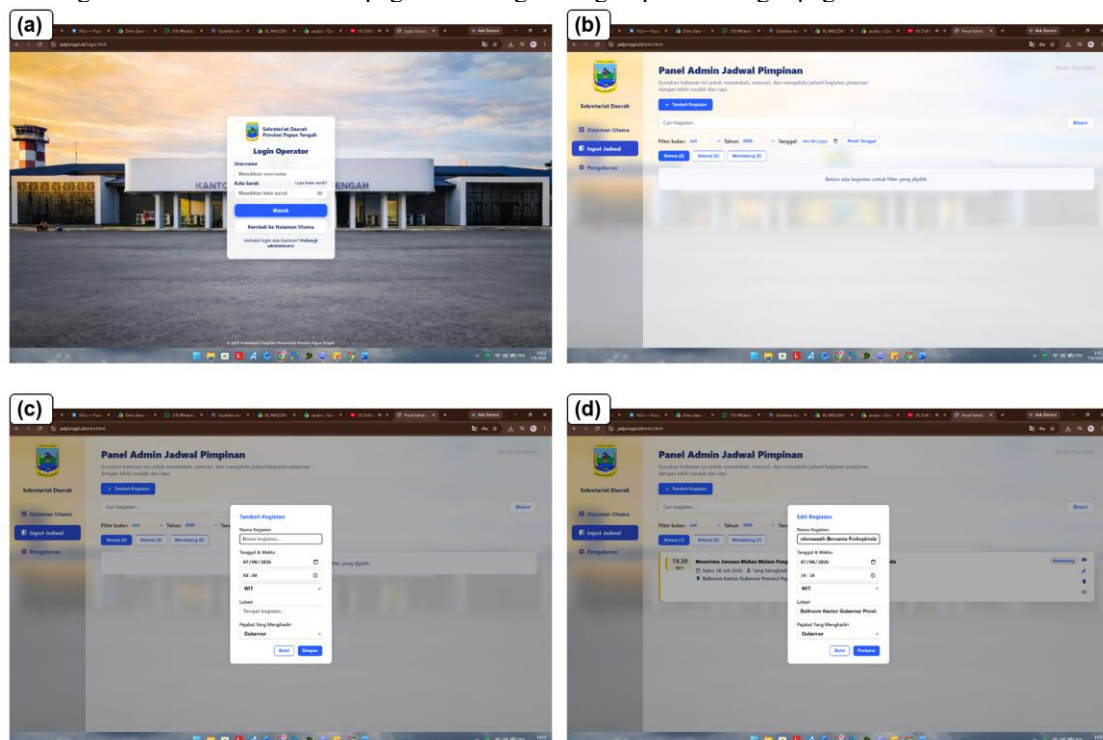


Figure 4. Operator and administration pages: (a) login; (b) administration panel; (c) add agenda; (d) edit and delete agenda

Figure 4(a) shows the operator login page, which restricts access to data management. After authentication, the operator can use the administration panel to add, edit, delete, search, filter, and export agenda data.

Figure 4(b) shows the administration panel used to manage leadership activity schedules. Its main features include adding an activity, searching agendas, filtering by month, year, date, or agenda status, and exporting data.

Figure 4(c) shows the add-activity form used to enter agenda data, including the activity name, date, time, time zone, location, and attending official. After the operator selects the save button, the agenda is added to the list and can be presented on the main dashboard.

Figure 4(d) shows the agenda update and deletion features. The edit function corrects stored activity data, while the delete function removes a selected agenda after system confirmation. These features help operators keep agenda data current.

Display Settings Implementation

The dashboard includes a display settings page for configuring running text, scrolling speed, agenda category colors, and the duration of agenda items on the main dashboard.

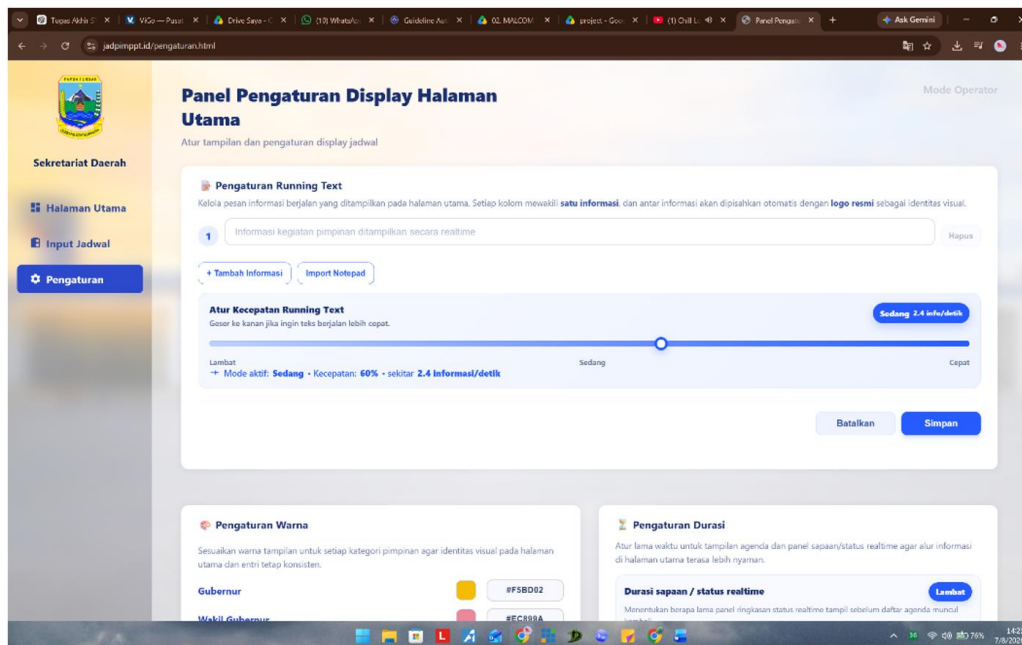


Figure 5. Display settings page

Figure 5 shows the display settings page used by operators to customize the dashboard. Running-text settings control the scrolling information at the bottom of the screen. Color settings distinguish agenda categories according to the attending official, while duration settings determine how long a status or agenda item remains visible.

These display settings make the system more flexible by allowing operators to adapt the dashboard to the information requirements of the monitor display.

Deployment on Display Monitors

The system was deployed on a display monitor in the governor's office. The dashboard was opened in a browser on a computer connected to a meeting-room monitor.

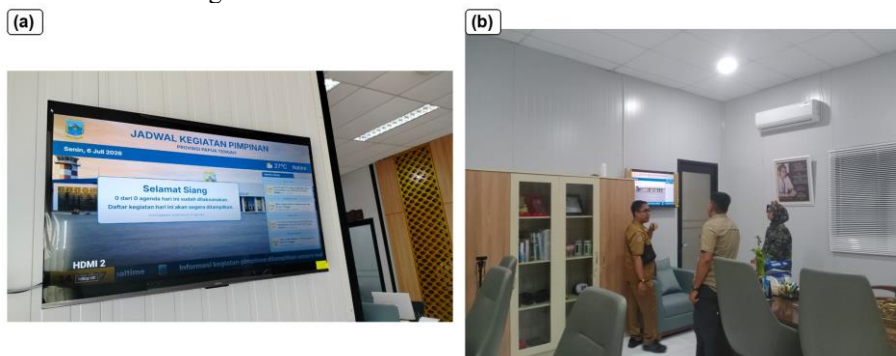


Figure 6. Dashboard deployment on monitors: (a) office monitor; (b) meeting-room monitor

Figure 6(a) shows the dashboard deployed on a monitor in an office or meeting room at the governor's office. This deployment demonstrates that the system operates not only on the development device but also in the actual workplace.

Figure 6(b) presents the dashboard on a meeting-room monitor. Employees and other relevant personnel can view agenda information directly, allowing leadership schedules to be monitored more easily and centrally.

Black-Box Testing

Black-box testing was conducted to determine whether each main feature met the system requirements. The tests covered the dashboard home page, date and time, weather, running text, operator page access, operator login, agenda management, display settings, full-screen presentation, periodic data updates, monitor presentation, and agenda data export.

Table 1. Black-Box Test Results for the Leadership Schedule Dashboard

No	Feature Tested	Test Scenario	Expected Result	Actual Result	Status
1	Dashboard home page	Open the dashboard website in a browser	The leadership schedule dashboard home page is displayed	The dashboard home page was displayed successfully	Valid
2	Date and time display	Open the dashboard and observe the clock	The date and time are displayed in real time using the Eastern Indonesia Time zone	The date and time were displayed successfully	Valid
3	Weather display	Open the dashboard	Weather information and the Nabire location are displayed	Weather and location information were displayed successfully	Valid
4	Running text	Open the dashboard home page	Scrolling information is displayed at the bottom of the dashboard	The running text was displayed and scrolled successfully	Valid
5	Operator page access	Select the Central Papua Provincial Government logo on the home page	The operator login page opens	The operator login page was displayed successfully	Valid
6	Successful operator login	Enter the correct username and password	The operator is directed to the administration page	The operator accessed the administration panel successfully	Valid
7	Failed operator login	Enter an incorrect username or password	Access is denied and the login page remains visible	Access to the administration page was denied	Valid
8	Add agenda	Complete the add-activity form and select Save	The agenda is stored and appears in the agenda list	A new agenda was added successfully	Valid
9	Display agenda on dashboard	Add an agenda through the administration page	The added agenda appears on the dashboard home page	The agenda appeared on the dashboard successfully	Valid
10	Edit agenda	Select an agenda, edit its data, and select Update	The agenda data reflect the update	The agenda was updated successfully	Valid
11	Delete agenda	Select Delete for an agenda	The system requests confirmation and deletes the data after approval	The agenda was removed from the list successfully	Valid
12	Filter agenda	Select a month, year, date, or agenda-status filter	Agendas matching the selected filter are displayed	Agenda data matched the selected filter	Valid
13	Upcoming agenda status	Add an agenda with a future time	The agenda is displayed with upcoming status	The agenda appeared with upcoming status	Valid
14	No-agenda status	No agenda exists for the current date	A message states that no agenda is available	The no-agenda message was displayed successfully	Valid
15	Running-text settings	Change the scrolling information on the settings page	The dashboard running text changes according to the operator input	The running text was updated successfully	Valid
16	Running-text	Change the running-text	The scrolling speed	The configured	Valid

	speed	speed	changes according to the setting	running-text was applied	speed	
17	Category color settings	Change the color of a leadership agenda category	The agenda color matches the configured category	The category color was applied successfully	Valid	
18	Display duration settings	Change the duration of an agenda item	The agenda display duration changes according to the setting	The display duration was applied successfully	Valid	
19	Full-screen display	Select the full-screen button on the dashboard	The dashboard opens in full-screen mode	Full-screen mode operated successfully	Valid	
20	Display on a monitor presentation	Open the dashboard on a computer connected to a meeting-room monitor	Leadership schedule information appears on the display monitor	The dashboard was presented on the monitor successfully	Valid	
21	Periodic data update	Update agenda data and allow the dashboard to retrieve the latest data	The dashboard updates schedule information without manual input on the display page	The latest data appeared on the dashboard successfully	Valid	
22	Agenda data export	Select the export button on the administration page	The system exports agenda data	Agenda data were exported successfully	Valid	

DISCUSSION

Interpretation and Comparison of Results

All tested features received a valid status in the black-box evaluation. The 22 scenarios ranged from dashboard presentation to agenda data export. These results indicate that the main system features performed as expected. The dashboard displayed schedules, dates, times, weather, running text, and leadership agendas. Operators could also access the administration page, add, edit, delete, and filter agendas, configure the display, and present the dashboard on a monitor.

The tests also showed that periodic data updates operated correctly. When an operator updated agenda data, the dashboard retrieved and presented the latest information without manual input on the display page. This capability supports the system's role as a real-time leadership agenda monitoring medium.

Overall, the implementation and testing results show that the web-based leadership schedule dashboard can support government agenda monitoring. The system presents schedule information centrally in an easily monitored format and can be displayed on monitors throughout the governor's office.

These findings are consistent with Bach et al. (2023) and Setlur et al. (2024), who emphasize that dashboards should present information systematically and support monitoring. The results also support Sultanum and Setlur (2025) regarding the role of text in helping users understand information context. In the developed system, this role is realized by presenting the activity name, time, location, attending official, agenda status, and running text in a single monitor view.

Unlike traffic dashboards that process spatial and temporal data (Bachechi et al., 2022), security dashboards that support situational awareness (Chung et al., 2023), and healthcare dashboards that provide near-real-time monitoring data (Kenigsberg et al., 2022; Sadhu et al., 2023), this study focuses on leadership agenda monitoring in a regional government. Its contextual contribution lies in integrating operator-managed schedules, periodic information updates, configurable presentation, and direct dashboard display on office monitors. This implementation also extends research on dashboards for organizational process monitoring and leadership decision-making (Curran et al., 2024; Zhang et al., 2022).

Study Limitations

This study was limited to one workplace, the Government of Central Papua Province; therefore, the findings cannot yet be generalized to institutions with different administrative workflows and infrastructure. The evaluation focused on functional testing through 22 black-box scenarios and did not measure user experience, operator satisfaction, work-time efficiency, update latency, system load capacity, security, or long-term service availability. Information presentation also depends on the hosting service, network connection, computer, and display monitor. Future research should evaluate usability, performance, security, and longitudinal use and should involve multiple government units or institutions.

CONCLUSION

This study successfully implemented a web-based leadership schedule dashboard for government agenda monitoring in the Government of Central Papua Province. The system was developed using the Prototype method



through requirements analysis, system design, implementation, testing, and deployment on display monitors. The resulting dashboard presents leadership schedules, other agendas, the date, a real-time clock, weather information, and running text in one centralized interface.

The system also provides an operator page for adding, editing, deleting, filtering, and exporting schedule data. Display settings allow operators to configure running text, agenda category colors, and display duration. Deployment on a monitor demonstrates that the dashboard can operate in the actual workplace as an easily monitored source of leadership agenda information for employees and other relevant personnel.

Black-box testing of 22 scenarios produced valid results for all main features. These results show that the system meets its requirements, including dashboard presentation, operator access, agenda management, periodic data updates, and monitor-based information display. The leadership schedule dashboard therefore supports faster, centralized, and structured agenda communication while reducing dependence on distributing schedules through separate messages or documents.

Future development may include full server-based data integration, automated notifications, an agenda change history, and more detailed user-management features to make leadership schedule management more secure and traceable.

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