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Police Duty Portal: A Web – Based Automation System for Duty Management

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ABSTRACT: The Police Duty Portal is a web-based system developed to automate the process of scheduling and managing police duties. The project aims to replace traditional manual record keeping with a centralized digital platform that ensures transparency, efficiency, and accuracy in duty allocation. Through role-based access, administrators can assign tasks, track attendance, and monitor officer availability in real time. The portal enhances coordination, reduces paperwork, and minimizes errors caused by manual processes. It also promotes accountability and provides quick access to duty details for both administrators and police officers. This system represents a step toward digital transformation in police administration, improving operational performance and communication across departments.

KEYWORDS: Police Duty Portal, Web-Based System, Duty Management, Automation, Role-Based Access, Efficiency, Digital Administration

I. INTRODUCTION

In the modern era of digitalization, government sectors are increasingly adopting technology to improve efficiency and transparency in their operations. The police department, being one of the most essential public service institutions, requires an effective system for managing duties, shifts, and personnel. Traditionally, duty assignments and schedules are maintained manually using registers or spreadsheets, which often result in time delays, data inaccuracy, and poor coordination.

The **Police Duty Portal** is developed to overcome these challenges by providing a centralized web-based platform for managing all duty-related activities. The system allows administrators to assign duties, view attendance, and monitor daily schedules in real time. Officers can log in to check their assigned duties, request changes, and view notifications. This digital approach enhances communication between officers and administrators, reduces paperwork, and ensures transparency in task allocation. By automating the duty management process, the portal improves efficiency, saves time, and minimizes human error. Overall, the system contributes to the modernization of police administration and supports the vision of a digitally empowered public sector.

1.1 Objective of the study
The primary objective of the Police Duty Portal is to develop a user-friendly and secure web application that automates the scheduling and management of police duties. This system aims to improve transparency, accuracy, and efficiency in administrative tasks while reducing manual effort.

The specific objectives include:
- To automate the process of duty allocation and monitoring.
- To create a centralized database for storing duty records and officer information.
- To provide real-time access for both administrators and officers through a secure login.
- To minimize human errors and time delays in managing duty schedules.
- To enhance communication and coordination within the police department.
- To ensure data security using role-based access control mechanisms.

1.2 Contributions

1. Software Requirements:

- **Front-End:** HTML, CSS, JavaScript
- **Back-End:** PHP
- **Database:** MySQL
- **Development Environment:** XAMPP / WAMP Server
- **Browser:** Google Chrome / Microsoft Edge
- **Operating System:** Windows 10 or above

2. Hardware Requirements:

- **Processor:** Intel Core i3 or higher
- **RAM:** Minimum 4 GB
- **Hard Disk:** Minimum 250 GB storage
- **Monitor:** 15" LED or higher resolution display

3. Additional Tools & Resources:

- Code Editor (VS Code / Sublime Text)
- Internet Connection for hosting and updates
- Localhost server setup for testing environment

II. METHODOLOGY

The Police Duty Portal was developed using a structured and systematic approach to ensure reliability, functionality, and ease of use. The methodology involves various phases, from requirement analysis to testing and deployment.

1 System Development Approach

The project follows the **Waterfall Model**, which includes stages such as requirement analysis, system design, implementation, testing, and maintenance. Each stage is completed before moving on to the next, ensuring clarity and accuracy in development.

2 System Architecture

The architecture of the portal is designed based on a **three-tier structure**:

- **Presentation Layer:** The front-end developed using HTML, CSS, and JavaScript, responsible for user interaction.
- **Application Layer:** The middle layer built using PHP, which processes requests and executes logic.
- **Database Layer:** The MySQL database stores user credentials, duty schedules, and attendance records.

3 Modules Description

The system consists of two major modules:

- **Admin Module:**
  o Assign and manage duties for police officers.
  o View daily reports and attendance.
  o Edit or delete duty records as required.
- **Police Officer Module:**
  o View assigned duties and schedules.
  o Update duty status or attendance.
  o Send messages or feedback to the admin.

4 Security Implementation

Security is ensured through password encryption and **role-based access control**, where each user has limited access based on their role (Admin or Officer). Sensitive data is stored securely in the database to prevent unauthorized access.

5 Testing and Evaluation

After development, the system was tested for functionality, user interface performance, and data accuracy. The portal successfully handled multiple users simultaneously and provided consistent, error-free results during testing.

III. FORMATION OF TABLE

Criteria	Manual System	Police Duty Portal
Data Storage	Paper-based records	Digital database (MySQL)
Accessibility	Limited and location-dependent	Accessible from any authorized device
Time Efficiency	Prone to errors	Instant scheduling and updates
Transparency	Low	High through role-based login

FORMATING FIGURE
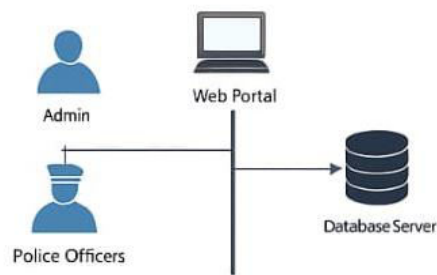
IV. FOTMATING OF MATHEMATICAL COMPONENT

Although the Police Duty Portal is primarily a web-based management system, a few mathematical calculations are used to measure system efficiency and performance. These formulas help analyze the effectiveness of the portal compared to manual duty management.

Formula 1 – Duty Allocation Efficiency (DAE):

$$DAE = \frac{\text{Total Duties Assigned Successfully}}{\text{Total Duty Requests}} \times 100$$

Explanation:

This formula calculates the **efficiency percentage** of the portal in assigning duties accurately without errors. A higher DAE value indicates a more reliable and efficient system.

Formula 2 – Time Efficiency (TE):

$$TE = \frac{\text{Manual Processing Time} - \text{Portal Processing Time}}{\text{Manual Processing Time}} \times 100$$

Explanation:

This equation measures how much time the Police Duty Portal saves compared to manual scheduling. The result shows the percentage improvement in time efficiency achieved through automation.

V. ACKNOWLEDGEMENTS

VI. RESULTS AND DISCUSSION

The Police Duty Portal was successfully implemented and tested. The system efficiently automated duty assignments, reduced manual errors, and improved transparency. Administrators could assign and monitor duties easily, while officers accessed their schedules through secure logins.

Testing showed faster performance, accurate data handling, and strong security compared to manual methods. Overall, the portal enhanced efficiency, saved time, and simplified communication between officers and administrators.

VII. CONCLUSION

The Police Duty Portal successfully automates the duty management process for police departments. It reduces paperwork, saves time, and minimizes human errors by providing a centralized digital system. The portal enhances transparency, security, and coordination between administrators and officers. Overall, it contributes to the digital transformation of police operations, making duty allocation faster and more efficient.

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