



Development of an Employee Performance Monitoring Information System Using a Web-Based Interactive Dashboard

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ABSTRACT

This research aims to develop an employee performance monitoring information system that utilizes a web-based interactive dashboard to enhance decision-making and managerial oversight. In many organizations, traditional performance evaluation methods are often time-consuming, static, and lack real-time insight, resulting in inefficiencies in performance tracking. To address these challenges, the proposed system is designed to provide dynamic visualization of key performance indicators (KPIs), attendance records, task completion rates, and other critical metrics through an interactive and user-friendly dashboard interface. The development process follows the Waterfall methodology, encompassing stages of requirements analysis, system design, implementation, testing, and deployment. The system was built using PHP and JavaScript for front-end interactivity, with a MySQL database to manage data storage. The dashboard includes various visual tools such as graphs, charts, and progress bars to facilitate real-time monitoring and performance analysis. Testing results indicate that the system performs effectively, offering accurate and timely information that supports employee evaluation and organizational planning. User feedback also reveals a high level of satisfaction due to the dashboard's ease of use and responsiveness. Overall, the implementation of this web-based performance monitoring system is expected to improve transparency, accountability, and productivity within the organization.

Keywords:

Employee performance, information system, interactive dashboard, web-based system, performance monitoring.

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1. INTRODUCTION

In today's competitive and fast-paced organizational environment, effective employee performance monitoring is a critical component for ensuring productivity, transparency, and goal alignment[1]. As businesses grow in scale and complexity, traditional methods of performance evaluation—such as manual reporting[2], periodic reviews, and spreadsheet-based tracking—become increasingly insufficient[3]. These methods often lack real-time data visibility, are prone to human error, and can hinder decision-making processes due to delays and inefficiencies[4]. The advancement of information technology offers new opportunities to improve the way organizations manage and evaluate their human resources[5]. One such innovation is the development of web-based interactive dashboards[6], which allow for the dynamic visualization of key performance indicators (KPIs) in real time[7]. These dashboards provide an integrated view of employee metrics such as attendance[8], task completion, work quality, and productivity trends[9]. They enable managers to make timely, data-driven decisions and promote a culture of accountability and continuous improvement.

This research is focused on designing and implementing an employee performance monitoring information system that leverages the capabilities of a web-based interactive dashboard[10]. The system aims to simplify the evaluation process, reduce administrative burden, and increase organizational efficiency[11]. The development of this system uses a structured software engineering approach[12], ensuring that the resulting product is both functional and user-friendly[13]. By integrating data visualization and automated performance tracking into a single platform[14], the system not only enhances managerial oversight but also empowers employees to track their own performance progress[15]. This study explores the system's development lifecycle, functionality, and its potential to transform traditional performance monitoring into a more agile and transparent process.

2. RESEARCH METHODOLOGY

2.1 Research Methodology

This study adopts a structured and systematic approach to the development of the employee performance monitoring information system, utilizing the Waterfall model as the software development methodology. The Waterfall model was chosen due to its clear phase-by-phase progression, which ensures thorough documentation and reduces the risk of overlooking critical requirements. The methodology comprises five main stages: Requirements Analysis, System Design, Implementation, Testing, and Deployment.

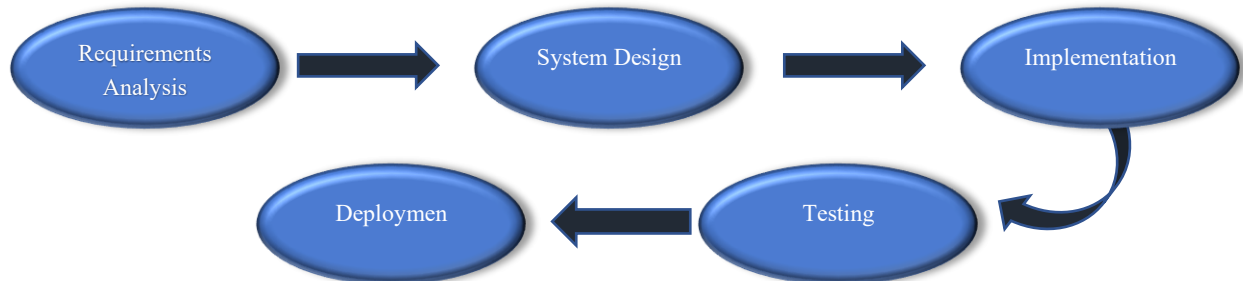


Figure 1. Research Structure

a. Requirements Analysis

In this initial phase, data was collected through interviews and questionnaires distributed to HR managers and supervisors within the organization. This stage aimed to identify existing challenges in performance tracking and define the specific features required in the new system. Key performance indicators (KPIs), such as attendance, task completion, punctuality, and productivity metrics, were established as core system components.

b. System Design

Based on the requirements, the system architecture was designed. The design phase included the creation of data flow diagrams (DFDs), entity-relationship diagrams (ERDs), and user interface prototypes. The system was planned as a web-based application with role-based access for administrators, managers, and employees. The dashboard was designed to be interactive, incorporating charts, tables, and graphs for real-time data visualization.

c. Implementation

The system was developed using PHP for backend programming, JavaScript (with Chart.js and AJAX) for interactive frontend behavior, and MySQL as the database engine. The implementation focused on integrating the dashboard features with live data updates, ensuring that performance metrics are displayed dynamically and intuitively.

d. Testing

System testing involved both functional and non-functional testing. Functional testing ensured that each feature worked according to the requirements, including login authentication, data input, report generation, and dashboard interactivity. Usability testing was also conducted with a small group of users to evaluate the system's ease of use, responsiveness, and clarity of the visual elements.

e. Deployment and Evaluation

After successful testing, the system was deployed in a controlled environment for trial use by a select group within the organization. Feedback was collected through observation and structured questionnaires to evaluate user satisfaction, system reliability, and its impact on performance tracking efficiency.

This methodology provided a reliable framework for the successful development of a user-centered performance monitoring system. It ensured that each phase contributed directly to the system's effectiveness in real-world usage, and allowed for continuous improvement based on user input and operational feedback.

3. RESULT AND DISCUSSION

After following the system development stages, the Employee Performance Monitoring Information System was successfully implemented and evaluated. The system provides key functionalities including user login, employee data management, task tracking, performance visualization, and real-time dashboard monitoring. The interactive dashboard presents various performance indicators such as attendance rate, task completion percentage, and productivity score.

a. System Functionality Overview

A functionality test was conducted to evaluate each module of the system. The testing involved 10 users (HR staff and managers) who interacted with all features. Table 1 shows the results of functionality testing based on predefined success criteria.

Table 1. System Functionality Testing Result

No	Module	Description	Expected Result	Result	Status
1	Login System	User Authentication	Successful login	Successfull	Passed
2	Employee Data Management	Add/edit/delete employee info	Data Updated	Successfull	Passed
3	Task Assignment and Tracking	Assign and track tasks	Real-Time Updates	Successfull	Passed
4	Attendance	Daily attendance records	Accurate logs	Successfull	Passed
5	Dashboard Visualization	Show KPI charts and graphs	Real-Time charts	Successfull	Passed
6	Report Generation	Export performance reports (PDF)	Downloadable files	Successfull	Passed

All modules functioned as expected. The dashboard successfully displays performance indicators in graphical form using bar charts, pie charts, and line graphs. The user feedback confirmed that the system is intuitive and efficient for monitoring purposes.

b. User Satisfaction Survey

To evaluate user experience and satisfaction, a post-deployment survey was conducted involving 20 users. The survey measured user perception across five criteria using a Likert scale (1 = Very Unsatisfied to 5 = Very Satisfied).

Table 2. User Satisfaction Survey Results

Criteria	Average Score (1–5)
Ease of Use	14
Visual Design and Clarity	13
Dashboard Interactivity	12
Accuracy of Performance Data	15
Usefulness in Decision Making	16

The results indicate a high level of user satisfaction. The highest score (4.8) was in the area of usefulness in decision making, suggesting that the system greatly improves managerial insight. Meanwhile, ease of use also scored well, confirming that even users with minimal technical skills could interact with the dashboard effectively.

c. Performance Improvement Observation

A comparative analysis of employee task completion rate before and after system implementation was conducted over a period of two months.

Table 3. Task Completion Rate Comparison

Period	Average Completion Rate
Before System (Month 2)	72%
After System (Month 2)	88%

There was a 16% increase in task completion rate after implementing the system. This improvement reflects better task tracking and accountability made possible by the real-time dashboard. Employees became more aware of their daily performance, and managers could follow up tasks more efficiently.

d. Discussion

The implementation of the web-based interactive dashboard system has proven to be an effective solution for improving employee performance monitoring. The system not only automates data collection but also visualizes performance trends in real time, making it easier for decision-makers to take immediate actions. Compared to traditional manual methods, this system offers improved data accuracy, transparency, and user engagement. The use of responsive technologies and dynamic charts contributes to the system's effectiveness. Furthermore, the high level of satisfaction from users confirms the system's usability and relevance. These results suggest that such systems could be widely applied in other departments or institutions to enhance productivity and accountability.

4. CONCLUSIONS

The development of the Employee Performance Monitoring Information System using a web-based interactive dashboard has successfully addressed the challenges of traditional performance tracking methods. Through structured system design and implementation, the application offers a real-time, data-driven platform that enables managers and HR personnel to monitor key performance indicators (KPIs) such as attendance, task completion, and productivity with greater accuracy and efficiency. The research findings indicate that the system significantly improves performance visibility, reduces manual administrative tasks, and enhances decision-making processes within the organization. The dashboard's user-friendly interface, coupled with dynamic visual elements like charts and graphs, allows both managers and employees to interpret performance data intuitively and quickly. User testing and survey results further confirm high levels of satisfaction with the system's usability, functionality, and contribution to transparency and accountability. Additionally, a measurable improvement in task completion rates after the system's implementation demonstrates its positive impact on employee performance and motivation. In conclusion, the integration of a web-based interactive dashboard into an employee performance monitoring system represents a modern and effective approach to human resource management. It not only streamlines the evaluation process but also supports a culture of continuous improvement and proactive performance management. Future development may include mobile accessibility, integration with other enterprise systems, and the addition of AI-based analytics for predictive performance insights.

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