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Development of an Automated Employee Performance Appraisal System to Boost Organizational Productivity

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ABSTRACT

The Employee Performance Evaluation System was developed to improve the efficiency, transparency, and accuracy of employee performance reviews. It addresses the limitations of traditional manual evaluations, such as bias, inconsistency, and data insecurity, by introducing an automated and user-friendly platform. The system integrates Key Performance Indicators (KPIs) to objectively assess productivity, identify areas for improvement, and recognize achievements. Role-based access control ensures data confidentiality and secure user access. Developed using the Object-Oriented Analysis and Design Methodology, the system employs PHP for backend processing, MySQL for database management, and JavaScript for interactivity. Testing results show that the system enhances the accuracy and fairness of evaluations, thereby boosting employee motivation and organizational performance.

Keywords: Performance; Evaluation; Automated; Indicators; Transparency; Accuracy; Management; Confidentiality; Interactivity; Platform.

1. Introduction

An Employee Performance Evaluation System is a structured process for assessing employee efficiency, effectiveness, and contribution to organizational goals. Traditional evaluation methods such as paper-based reviews and manual assessments have proven to be biased, inconsistent, and inefficient. As organizations expand, the need for automated systems has become essential to ensure transparency, fairness, and real-time feedback.

The performance review generally looks back at an employee's performance over the past year and involves setting new plans and goals for the year ahead. Employee performance reviews are necessary at all universities to assess a staff member's progress in the workplace. However, employees should no longer need to be filled out on reams of paper, scanned into a management system, and stored in a filing cabinet. The use of the Employee Performance evaluation system should digitally complete your employee assessments with no paperwork. Technological advancements in the 21st century have enabled the design and implementation of digital solutions for human resource management, including performance evaluation systems. Automated employee performance evaluation systems leverage data analytics, cloud computing, and artificial intelligence (AI) to offer more comprehensive and objective assessments of employees (Huselid, 2015). These systems typically track key performance indicators (KPIs), assess employees based on preset criteria, and provide feedback in real-time.

By automating the process, these systems reduce human error and subjectivity, thereby promoting fairness and transparency in performance reviews (Mamun and Hasan, 2017). The design and implementation of employee performance evaluation systems come with several advantages. Firstly, they provide immediate access to evaluation data, enabling managers to make more informed decisions regarding employee development and reward programs (Mone and London, 2018). Secondly, these systems promote continuous feedback rather than annual or bi-annual reviews, which has been shown to improve employee engagement and motivation (Pulakos, 2019).

Lastly, they can integrate with other HR management systems, such as payroll, training, and talent management, to offer a holistic approach to workforce management.

Despite these advantages, implementing an employee performance evaluation system is not without challenges. Many organizations struggle with the technical requirements, such as the integration of the system with existing HR infrastructure, and the resistance to change from employees who are accustomed to traditional evaluation methods (Jiang et al., 2012). Additionally, the accuracy of the system depends on the quality of the data input, and biased or incomplete data can lead to flawed evaluations. Thus, ensuring that the system is designed in a way that promotes accuracy, transparency, and user engagement is critical to its success.

Most organizations still rely on manual performance evaluations that are time-consuming, biased, and inconsistent. Existing systems often lack flexibility, fail to adapt to modern workforce dynamics, and provide delayed feedback, leading to poor decision-making and reduced productivity.

1.1. Objectives of the Study

The aim of this study is to design and implement an efficient and scalable Employee Performance Evaluation System that automates the appraisal process. The specific objectives are to:

- To build a module that will analyze existing performance evaluation practices.
- Develop a user-friendly automated evaluation system.
- Incorporate KPIs for effective performance tracking.
- To implement role-based access control for data security.

This study will promote transparency, fairness, and accuracy in performance evaluation. It will enhance decision-making by providing data-driven insights, improve employee motivation through regular feedback, and ensure objective assessments based on measurable performance metrics.

The system focuses on automating performance evaluations in medium-sized organizations, emphasizing accuracy, efficiency, and support for human resource decisions.

2. Review of Related Literature

Employee performance evaluation dates back to the industrial revolution when it was used to measure organizational efficiency (Daoanis, 2012). Over time, the process evolved from being a disciplinary measure in the 1940s to a structured means of improving employee motivation and productivity (Igbojekwe et al., 2015). By the 1970s, the concept of performance management emerged, emphasizing continuous feedback and performance-based pay (Kolawale et al., 2010). According to Ibeziako (2025), the performance management framework enables continuous quality service through organizational reflection. Despite its evolution, traditional evaluation methods were often subjective, relying on personal judgment and lacking standardized criteria. Modern Employee Performance Evaluation Systems (EPES) now adopt data-driven approaches that use Key Performance Indicators (KPIs) to ensure fairness and accuracy (Shields et al., 2015). These systems assess employees based on skills,

achievements, and alignment with organizational goals, providing a foundation for promotions, rewards, and professional development (Pavlov et al., 2017). Recent trends have shifted toward continuous feedback and 360-degree evaluations, reducing bias and promoting growth (Aguinis, 2019). Technological innovations have further enhanced these systems, allowing real-time monitoring and dynamic feedback processes (Bersin, 2018).

Information Technology (IT) has transformed performance evaluation by automating processes and improving accuracy. IT-based systems enable real-time tracking of employee goals, reduce paperwork, and provide data analytics for better decision-making (Michael, 2013). Through integrated platforms, managers can gather multi-source feedback, identify training needs, and recognize high performers (Smith & Johnson, 2021). Cloud-based systems also support remote and hybrid work environments, ensuring consistent and transparent evaluation regardless of location Brown, (2020).Evolutionary computation is being used to improve software as claimed by (Ugah et al., 2025).

Furthermore, the use of IT in performance evaluation aligns with the growing trend of remote work and digital collaboration. With more employees working from different locations, organizations must adopt systems that allow for effective communication and evaluation regardless of physical presence. IT solutions, such as cloud-based performance management systems, provide employees and managers with access to evaluation tools from anywhere, facilitating timely feedback and ongoing performance discussions. This flexibility not only enhances employee engagement but also ensures that performance evaluations are conducted consistently and fairly across the organization. As organizations continue to navigate the complexities of the modern workplace, leveraging IT for performance evaluation will be essential in maintaining a motivated and high-performing workforce (Brown, 2020).

An Online Employee Performance Evaluation System (OEPES) utilizes digital tools to assess employees efficiently across different time intervals. It provides structured, transparent, and timely feedback, improving engagement and productivity. By leveraging web technologies, organizations can simplify evaluation processes, minimize bias, and foster a culture of continuous performance improvement.

Implementing an employee performance evaluation system is a multifaceted process that often encounters several challenges. These challenges can hinder the effectiveness of the system and impact employee morale and productivity.

Below are some of the key challenges faced during the implementation of performance evaluation systems:

Resistance to Change: Employees and managers may resist new evaluation systems due to fear of change or skepticism about the new processes. This resistance can stem from concerns over transparency, perceived fairness, and the impact on job security. According to Kotter (1996), organizational change often faces hurdles due to employees' attachment to existing systems and practices, which can lead to a lack of engagement with the new system.

Lack of Clear Objectives: Many organizations fail to define clear objectives for performance evaluation systems. Without well-articulated goals, the system may not meet the needs of the organization or its employees. A study by

Mone and London (2018) emphasizes that clearly defined objectives are essential for aligning employee performance with organizational goals and ensuring that evaluations serve a meaningful purpose.

Inadequate Training: Insufficient training for both evaluators and employees can lead to misunderstandings about the evaluation process, criteria, and tools. A report by the Society for Human Resource Management (SHRM, 2020) indicates that organizations that invest in comprehensive training programs for their performance evaluation systems tend to experience higher employee satisfaction and engagement. Conversely, lack of training can result in inconsistent evaluations and bias.

3. Materials and Methods

Methodology is a component that includes procedure, techniques, tools and documentation aids which intends to help the developer to develop a system. In this work, the methodology used is the Object-Oriented Analysis and Design Methodology (OOADM) which attempts to properly define and document the class hierarchy from which all the system objects are created and object interactions are defined. Object-Oriented Analysis and Design Methodology is an effective guide to apply to business problems. In development activity which consists of objects, classes, frameworks and interactions. The use of this methodology helps to produce a better-quality software product, in terms of documentation standards, acceptability to the user, maintainability and consistency of software. The choice of this methodology arose from the fact that it decomposes the system into modules where each module in the system denotes an object or class of an object. This methodology full supports software flexibility, modularity and allows for ease in the modification of any segment of the software.

4. Data Gathering Techniques

Interviews: In view to investigation, office representatives and manager who are potential users of the proposed system were interviewed. This method yields the most profitable result as it is obtained by physical contacts; hence a firsthand knowledge of the various processes involved is obtained by speaking to the operator of the system. The essential element of the interview is obtained directly and in a short time than when other methods are employed since the interviewer is with the interviewed. This immediate feedback gives the opportunity to ask ambiguous questions and hence, obtain detailed responses.

Observation: The observation is another fact-finding technique that was adopted, which I paid close attention to the day to day activities which provided another perspective and better understanding of procedures.

Internet: Information such as background information, technical materials and news about the Employee appraisal trends and development which were gathered to publish this topic were obtained in sources like newspapers, and journals

4.1. Analysis of the Proposed System

After critical review of the related works, the proposed system should be able to provide a platform where staff can input their quarterly or yearly task information and also for the Manager to appraise their staff through the same channel and later transferred to the Organization Head for recommendations and promotions.

4.2. Data Flow Diagram of the Proposed System

The diagrams below describe the flow of information in the proposed system and also dictate how the system works.

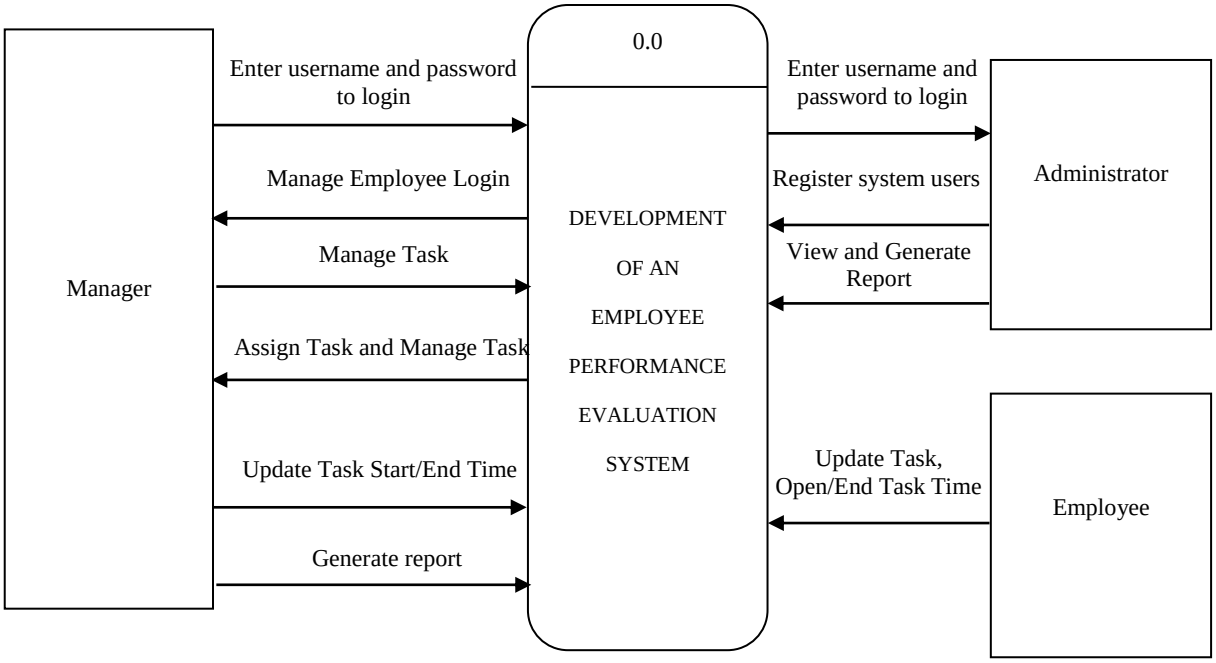

Figure 1. Data Flow Diagram for Employee Performance Evaluation System

Figure 1 is the dataflow diagram of the proposed system; here the manager will login with correct details to Manage Employee Login, Manage Task, Provide Feedback, Update Task Start/End Time and also Generate report.

5. System Design

System design focuses on defining the architecture, components, modules, interfaces, and data needed to meet the system's requirements. It emphasizes creating an effective user interface that ensures proper interaction between the end user and the software. A well-structured design establishes a clear relationship between the system's input and output, ensuring that all interface elements and forms function efficiently to achieve the intended specifications.

5.1. User Interface Design

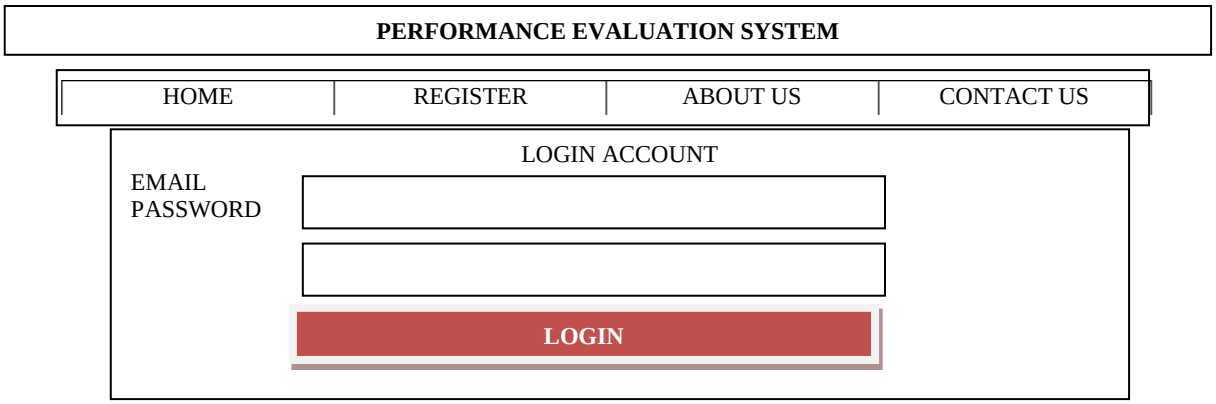

Figure 2a. User Interface Design for the performance Evaluation system

5.2. Registration Input Design

The registration input design enables the users to input their details in other to register to the system. The input design is shown below:

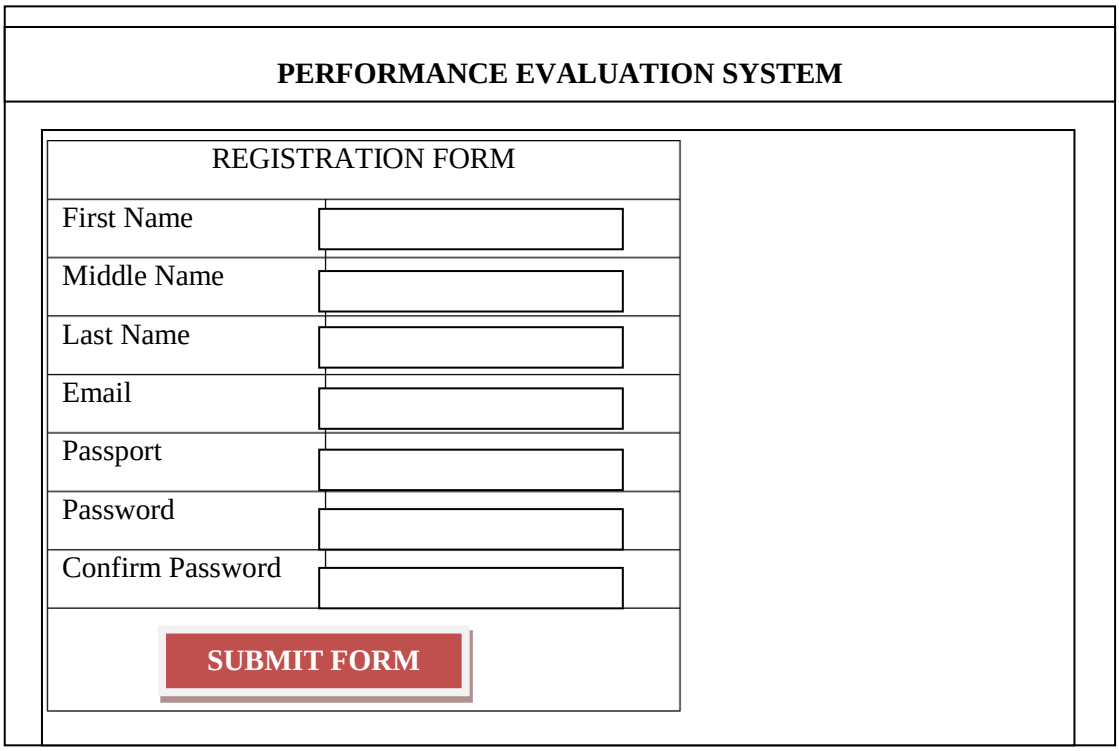

Figure 2b. User Registration Input Design for the performance evaluation system

6. System Implementation

The implementation stage is a very important stage in the Software Development Life Cycle. In this phase, the design made during the system design phase is put into codes; without this phase, there can be no system. After successful design of a system come the implementation activities. These activities include: testing, documentation and running in a browser. The following are the implementations of the system. The implementation of the main system was done with PHP, CSS, JS and HTML on Virtual Studio Code editor.

6.1. Main Menu Interface implementation

The Main Menu Interface implementation Displays the default page of the site where all the system subsections can be accessed.

Figure 3. Main Menu Interface implementation for the performance evaluation system

6.2. Input Implementation

The word input entails the various data supplied to the system which are processed to give out an output. The figures below show the input forms used in the implementation of the new system.

6.2.1. Registration Input Implementation

The registration input implementation is a form that will enable admin to add a new user in other to assign email and password, the system will also store the user's details. The registration input enables the user to input his or her information in other to have a password and email that he or she will be using to login into the system subsequently, this registration input implementation, enable the system to keep the user details.

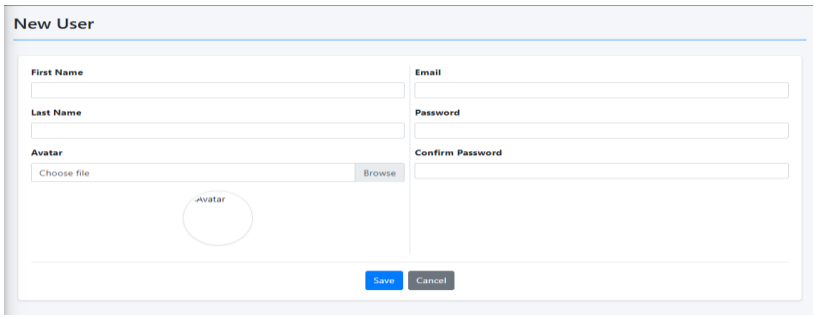

Figure 4. Registration Input implementation for the performance evaluation system

6.2.2. Login Input implementation

The login input implementation is a form that will enable a user to gain access to the system

Figure 5. Login Input Implementation for the performance evaluation system

6.3. Output Interface Implementation

The output interface implementation is the result of the input to the system, the out implementation is shown below:

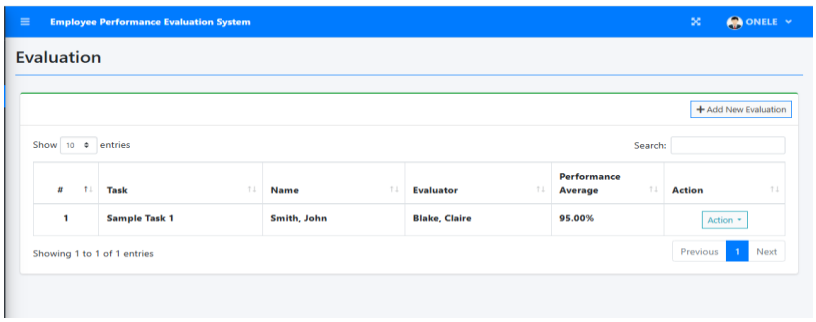

Figure 6. Output Employee Performance Evaluation Implementation

6.4. Database Implementation

Database implementation specifies the structure of the database that will be used in the system. The name of the database used in the design is epes_db it has 9 tables. The structure is displayed below:

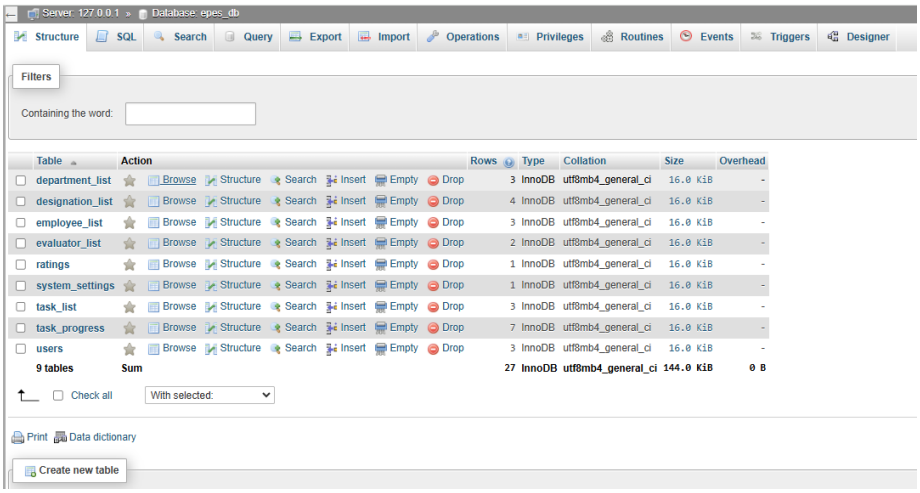

Figure 7. Database Implementation for the performance evaluation system

6.5. System Requirement

This section describes the hardware components and software requirements needed for effective and efficient running of the system.

Table 1. Hardware Requirement for the performance evaluation system

Hardware	**Minimum System requirement**
Processor	2.4 GHZ System requirement
Memory	128 MB RAM (256 MB Recommended)
Disk Space	80 GB (20 GB for Database

Other important component and peripherals like mouse, Keyboard, and UPS (Uninterruptible Power Supply).

Table 2. Software Requirements for the performance evaluation system

Software	**Minimum System requirement**
Operating System	Windows 7 or later
Database Management System	MYSQL
Browser	Firefox v 4.0 or later, Google chrome.
Web server	Xampp Server

7. System Testing

System testing was conducted to ensure that the developed Employee Performance Evaluation System functioned correctly and met both functional and non-functional requirements. The system was thoroughly executed to verify its accuracy, efficiency, and reliability. Successful testing confirmed that the software met user expectations and operated without critical errors.

7.1. Unit Testing

Each module of the system was independently tested to confirm proper functionality. This ensured that all components—such as login, employee management, evaluation, and reporting—performed as intended before integration.

7.2. Integration Testing

After unit testing, the modules were combined and tested collectively to confirm seamless interaction between components. The user interface and usability were also validated to ensure a smooth workflow across all sections of the web application.

7.3. Test Data and Results

Sample data was used to validate the system's operations. The expected and actual outcomes were compared, showing that login authentication, task assignment, evaluation, and report generation all produced accurate results with minimal variance. The system granted appropriate access levels and performed all intended functions effectively.

7.4. Performance Evaluation

The system was evaluated for responsiveness and efficiency. It met the expected performance standards, handling user requests and database operations within optimal time limits.

7.5. Software Integration

All modules were integrated incrementally and tested after each combination to ensure proper interaction. A final test confirmed full system functionality and data consistency after complete integration.

7.6. Program Documentation

Comprehensive program documentation was prepared, detailing input requirements, processes, and output specifications. This supports future maintenance and further development of the system.

8. Conclusion

This study focused on the design and implementation of an efficient and scalable Employee Performance Evaluation System to improve how organizations assess staff performance. The project addressed the challenges of manual evaluation methods, such as bias, delays, and inconsistency, by introducing an automated and transparent system. Using Key Performance Indicators (KPIs), the system measures productivity, identifies areas for improvement, and recognizes achievements. It also employs role-based access control to secure sensitive data and ensure accountability. Overall, the system enhances accuracy, fairness, and transparency in performance evaluations, leading to increased employee motivation and improved organizational outcomes.

The developed Employee Performance Evaluation System successfully overcomes the limitations of traditional methods by automating and standardizing the evaluation process. Through KPI integration and secure access

control, the system ensures objective, fair, and efficient assessments. It reduces time and administrative effort while promoting informed decision-making and improved workforce productivity. Ultimately, the system fulfills the study's aim of enhancing organizational performance through reliable and data-driven employee evaluations.

9. Future Suggestions

1) Regular Updates: Periodically update and customize the system to align with evolving organizational goals and departmental needs.

2) Training and Support: Provide user training and technical support to ensure effective system utilization.

3) Enhanced Data Security: Implement stronger encryption and authentication protocols to protect sensitive information.

4) Feedback Mechanism: Introduce a feedback feature to gather user input and improve the system continually.

5) System Integration: Integrate the evaluation system with other HR tools for a more comprehensive performance management framework.

Declarations

Source of Funding

This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Competing Interests Statement

The authors declare that they have no competing interests related to this work.

Consent for publication

The authors declare that they consented to the publication of this study.

Authors' contributions

All the authors took part in literature review, analysis, and manuscript writing equally.

Availability of data and materials

Supplementary information is available from the authors upon reasonable request.

Institutional Review Board Statement

Not applicable for this study.

Informed Consent

Not applicable for this study.

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