



Design and Implementation of Staff Productivity Management Information System

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Received: August 14, 2023

Published: August 22, 2023

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Abstract

The Staff Productivity Management Information System is a software application designed to help organizations manage and improve productivity of their staff. The management of task and the ability to evaluate task performance is a major problem to members of staff and the organizations. The system provides a platform for managers and supervisors to evaluate the task performance of their staff members based on a set of predefined metrics such as quality of work, productivity, communication skills, teamwork and problem-solving abilities. The evaluation process involves the use of metrics and rating scales which are designed to ensure fairness and consistency in evaluation across the organization. The system provides tools for setting performance goals, tracking progress and communicating feedback to staff members. The staff productivity management Information system is designed to be user-friendly, customized and scalable to meet the needs of organizations of different sizes and industries. HTML, CSS and JavaScript were used to design the Front-end while PHP, and MySQL were used to develop the Back end of the system. The system has the potential to improve organizational performance, employee engagement and job satisfaction by providing a data-driven approach to managing staff productivity.

Keywords: Staff; Productivity; Management; Performance; Evaluation Task; Evaluator; Organization; Database; Web-Based; System

Introduction

Staff productivity management systems are essential tools for organizations to assess the effectiveness of their workforce. The implementation of such systems is crucial for companies to identify areas where employees need improvement and to provide constructive feedback to encourage their development. Performance evaluation systems help organizations to align individual employee goals with the company's objective, which increases productivity, job satisfaction, and employee retention rates. Staff productivity is an assessment of a worker or a group of workers' efficiency. Productivity of a given worker can be assessed relative to an average output for employees doing similar work. Productivity may be evaluated in terms of the output of an employee in a specific period of time. It can be assessed according to the amount of units of a product or service that an employee handles in a defined time frame [1].

The need for staff performance evaluation system arises from the changing dynamics of the business environment. Companies are facing increased competition, global markets, and technological advances that require a skilled and competent workforce. The success of the organization is dependent on the performance of its employees, making it essential to evaluate their performance regularly. Staffs need to work under a predetermined budget, ful-

fill specifications or minimum quality limits, and complete task on time as scheduled.

Furthermore, the lack of a systematic and consistent approach to evaluating employee performance can lead to demotivation, decreased job satisfaction, and high staff turnover rates. This can negatively impact the organization's bottom line, as it leads to higher recruitment and training costs, lost productivity, and decreased morale among the remaining staff.

Therefore, the implementation of an effective staff performance evaluation system is essential for organizations to achieve their goals and remain competitive in the marketplace. It provides an objective and standardized approach to evaluating employee performance, identifies areas for improvement, and helps employees to grow and develop within their roles. Ultimately, the implementation of a staff performance evaluation system is essential for organizations to succeed and thrive in today's fast-paced business environment.

Staff productivity management system gives rise to a variety of factors that motivates the organizations to explore and implement such systems; this system can help organizations monitor and manage employee performance regardless of their location; it can help

the organization to optimize the use of their human resources, ensuring that employees are working effectively and efficiently; it can provide organization with valuable data on employee performance, allowing them to make data-driven decisions and identify areas for improvement; by improving staff productivity, organization can increase the overall profitability and competitiveness in the market.

As the organizational world is moving faster and becoming more competitive, almost every organization needs to use web based staff productivity management system, or newer technologies to facilitate their task and to be in pace with this fast moving Information Technology world.

Literature Review

A Staff Productivity Management System (SPMS) is a structured approach to assessing the performance of employees within an organization. The system aims to identify the strengths and weaknesses of individual employees, provide feedback on task performance, and help employees goals for professional development.

The evaluation process can involve various methods, including self-evaluation, peer review and supervisor assessment. It typically includes criteria such as job knowledge, quality of work, productivity communication skills, teamwork, and adherence to organizational policies and procedures.

The benefits of a well-designed performance evaluation system include increased motivation and job and job satisfaction, improved employee retention, and a better understanding of individual strengths and weaknesses. It can also help identify areas for training and development, provide a basis for career advancement, and support the decision-making process for promotions, transfers, and terminations [2].

However, there are also potential drawbacks to performance evaluations, such as bias, subjectivity, and a focus on short term results rather than long term growth. The evaluation process must be carefully designed to minimize these issues and ensure fairness, transparency and objectivity.

Overall, a Staff productivity management system (SPMS) can be an effective tool for promoting employee growth and development, as long as it is implemented in a fair, consistent and transparent manner.

Review of related literature

Employee Information Management System

[3], presents a report that describes the development and presentation of an information system for managing the staff data within a small company or organization. It comprises of functions relating to application programming and database. The system as

such that has been designed is called the Employee Management System. The designed system will be responsible for keeping records and storing data of the staff within an organization and generating reports when requested. The choice of the programming tools is individual and particular [2].

- **Computerize Staff Record Management System:** [4], presented a research that developed a computer based software that for managing and keeping records of their staff. This system showed improvement in efficiency and cost of resources in managing staff record. In this system, departments have to take attendance manually, only these records have to be entered into the computerized system. But in this also, the problem of data entry mistake may possibly still occur.
- **Wireless Iris Recognition Attendance Management System:** [5], has proposed a system that lays its focus on wireless iris recognition attendance management system which was designed and implemented using Daugman's algorithm [6]. Building the system requires hardware for executing the iris recognition which may lead to another expenses. Therefore, a final version of the system was not made.
- **Attendance System:** The paper presents an attendance system for staffs which can mark attendance using Bluetooth. Under the description of this paper, the attendance is being taken using the staff's mobile device. Therefore, an application software will be installed in all of the staff's mobile device which will enable it to query staff's mobile device via Bluetooth connection and through transfer of the staff's mobile telephone Media Access Control (MAC) through that the presence of the staffs can be confirmed. The problem of this proposed system is staff's phone is required for attendance. In case of staff absent a colleague can mark the attendance. So presence of student is not necessary only phone should be in coverage area [7-10].

Methodology and System Analysis

Structure system analysis and design methodology (SSADM)

This is a method of analysis used in specifying or gathering a system requirement specification, where the functional and non-functional requirements of a given system is analyzed. The structure and hierarchical structure or units of the system are defined and decomposed into the developed system. The proposed system employed this methodology, whereby the requirement of the system was gathered and structured into functional units. Unit test were conducted and bugs fixed, then all units integrated together to form the proposed system.

System analysis

System analysis can be defined as the procedural study of the functions and activities carried out by an existing system with the aim of identifying the problems faced by the existing system and based on the problems discovered; a new and more efficient sys-

tem is designed. The steps usually include, gathering data from current system and then create a specification that defines what the new system will do. The design will involve bringing components of a system, which will serve as an information unit specifying what the system will do with specified procedures, files, input and output requirements respectively.

Analysis of the existing system

The present system is a file system where information regarding projects and different task are stored in hard copies and kept in files and the documents in files are finally kept in shelves and

drawers. In this system, access to information will require going to physically sort out files and folders where needed information is stored and most times not found due to mishandling.

Analysis of the proposed system

This section identifies the methodology and all the modules in the new system design. System design is the process employed to develop a series of steps with logical order. All the modules work together as a system to achieve the objectives of the automated system.

High level model of the proposed system

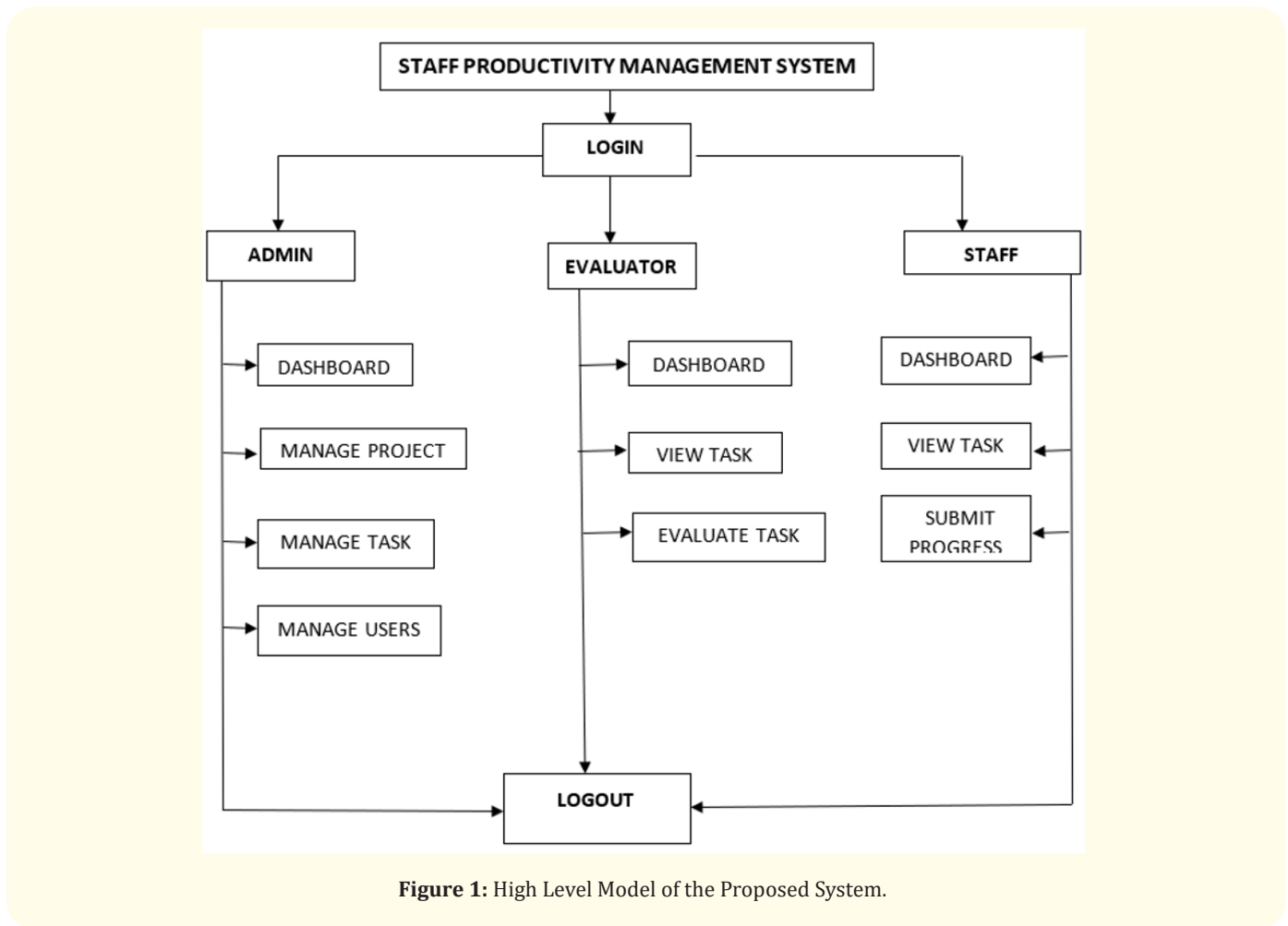


Figure 1: High Level Model of the Proposed System.

System design and implementation

This phase is composed of several systems and it focuses on the detailed implementation of feasible system, it also involves the development and implementation of the new system as well as identifying the various hardware and software the new system is built upon. The objective of this design is to develop a software that can carry out the functionality of staff productivity management system, where staff can easily access their task and also report task progress and their evaluators can easily evaluate the task assigned and rate the average performance of the staff.

Data dictionary

The data dictionary for this system is developed using PHP and MySQL. The data dictionary table as seen below in table 1 to table 9 in general, contains information about the following

Input/output format

Input format

Input design involves capturing data as well as in putting it into the computer. Accordingly, input design consist of data capturing and data validation.

Field name	Field type	Field size	Extra/remarks
Id	Int	11	Auto Increment
Department	Varchar	225	
Description	Varchar	225	

Table 1: Department List.

Field name	Field type	Field size	Extra/remarks
Id	Int	11	Auto Increment
Designation	Varchar	225	
Description	Varchar	225	

Table 2: Designation List.

Field name	Field type	Field size	Extra/remarks
Id	Int	11	Auto Increment
Employee ID	Int	11	
First Name	Varchar	225	
Middle Name	Varchar	225	
Last Name	Varchar	255	
Email	Varchar	255	
Password	Varchar	255	
Department Id	Int	11	
Designation Id	Int	11	
Evaluator Id	Int	11	
Avatar	Varchar	225	
Date Created	Timestamp		

Table 3: Employee List.

Field name	Field type	Field size	Extra/remarks
Id	Int	11	Auto Increment
Employee ID	Int	11	
First Name	Varchar	225	
Middle Name	Varchar	225	
Last Name	Varchar	255	
Email	Varchar	255	
Password	Varchar	255	
Department Id	Int	11	
Designation Id	Int	11	
Evaluator Id	Int	11	
Avatar	Varchar	225	
Date Created	Timestamp		

Table 4: Evaluator List.

Field name	Field type	Field size	Extra/remarks
Id	Int	11	Auto Increment
Employee Id	Int	11	
Task Id	Int	11	
Evaluator Id	Int	11	
Efficiency	Int	11	
Timeliness	Int	11	
Quality	Int	11	
Accuracy	Int	11	
Time	Varchar	255	

Table 5: Ratings List.

Field name	Field type	Field size	Extra/remarks
Id	Int	11	Auto Increment
Name	Varchar	100	
Email	Varchar	255	
Contact	Varchar	100	
Address	Varchar	255	
Cover Image	Varchar	100	

Table 6: Systems Settings.

Field name	Field type	Field size	Extra/remarks
Id	Int	11	Auto Increment
Task	Varchar	100	
Description	Varchar	255	
Employee ID	Varchar	100	
Due Date	Timestamp		
Completed	Timestamp	100	
Status	Int	11	
Date Created	Timestamp		

Table 7: Task List.

Field name	Field type	Field size	Extra/remarks
Id	Int	11	Auto Increment
Task Id	Int	11	
Progress	Varchar	255	
Is Complete	Boolean		
Date Created	Timestamp	255	

Table 8: Task Progress.

Field name	Field type	Field size	Extra/remarks
Id	Int	11	Auto Increment
Full Name	Varchar	255	
Address	Varchar	255	
City	Varchar	255	
Gender	Varchar	255	
Email	Varchar	255	

Table 9: Users.

Admin

In figure 2 below, the system enables the admin to login with a username and password to access the evaluator who is logged in and also view the staff dashboard.

The form is titled 'Admin Login Input'. It features a text input field labeled 'Admin Username', a password input field labeled 'Password...', and a rectangular button labeled 'Login' at the bottom center.

Figure 2: Admin Login Input.

Staff

In figure 3 below, the system enables staff (user) to login with a username and password to access their respective dashboard.

The form is titled 'Staff Login Input'. It features a text input field labeled 'Staff Username', a password input field labeled 'Password...', and a rectangular button labeled 'Login' at the bottom center.

Figure 3: Staff Login Input.

Evaluator

In figure 4 below, the system enables the evaluator to login with a username and password to access his or her dashboard.

The form is titled 'Evaluator Login input'. It features a text input field labeled 'Evaluator Username', a password input field labeled 'Password...', and a rectangular button labeled 'Login' at the bottom center.

Figure 4: Evaluator Login input.

Output Format

This is the most vital source to the user; it is a process that involves the designing of the necessary output that should be presented to the user according to requirement.

Admin

The admin output design in figure 5 below displays access to different managerial phase after logged in, such as the courses, users, assessments and also their subsection.

The dashboard is titled 'ADMIN' and 'Staff performance Evaluation'. It includes a 'Logout' button in the top right. A sidebar menu on the left lists: Dashboard, Task, Evaluation, Departments, Designations, Employees, Evaluator, and Users. The main content area has a 'Home' button and six data cards: Total Departments, Total Designations, Total Users, Total Employees, Total Evaluators, and Total Tasks.

Figure 5: Admin Entity Output.

Staff

The staff output design in figure 6 below displays access to all task assigned to various staff.

Evaluator

The evaluator output design in figure 7 below displays access to the staff and also access to the task.

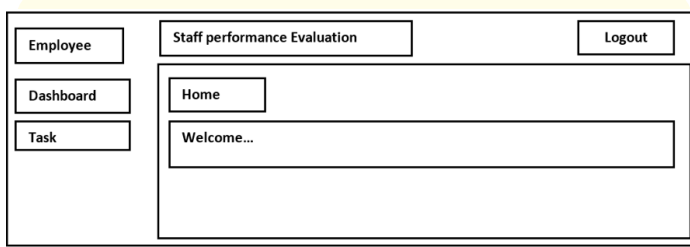


Figure 6: Staff Entity Output.

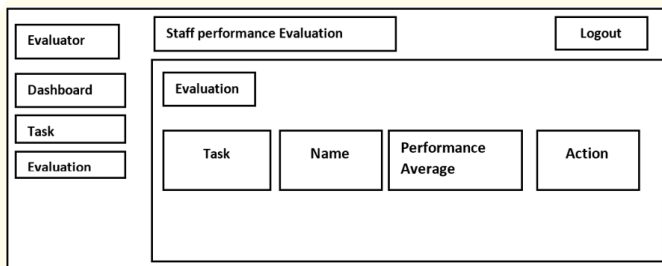


Figure 7: Evaluator Entity Output.

Program algorithm

Admin algorithms

- Start
- Login with username and password
- If (username and password) is correct, then
- Access admin dashboard
- Else
- Display incorrect login details
- Return back to login menu
- End.

Staff algorithm

- Start
- Login with username and password
- If (username and password) is correct, then
- Access staff dashboard
- Else
- Display incorrect login details
- Return back to login menu
- End.

Evaluator algorithm

- Start
- Login with username and password
- If (username and password) is correct, then
- Access evaluator dashboard
- Else
- Display incorrect login details

- Return back to login menu
- End.

Hardware requirements

Hardware, in computer world refers to the physical components that make up a computer system, they are usually connected together to create a complete system. The minimum hardware requirements for the system are

- Screen Resolution Recommended (1280 X 800) Minimum of (1280 X 270)
- 256MB Random Access Memory (RAM Size)
- 128 MB Hard Disk Drive
- Pentium 3 Central Processing Unit.

Software requirements

Software are applications that runs on a system; they can only be seen but cannot be touched. The software requirements for this application are

- Windows 8.1 Operating System or later Microsoft Windows OS version,/Mac OSX
- Web Browser (chrome, Firefox, safari)
- XAMPP Server (this has apache server to interpret PHP)
- Sublime Text (for coding and debugging).

Summary

The study was carried out to examine the Staff Productivity Management Information System. In order to achieve this aim, specific objectives were raised which is to design a staff performance evaluation system and to examine if it caters for the needs of the of organization to evaluate task.

In this study, the achievement of the set objectives was made possible using web programming languages and the implementation of web-based system focused on appropriately assessing the staff towards performing their task while creating the working path platform to attain good result.

The work was successfully developed using HTML, CSS, PHP and JavaScript programming languages. The package was tested and improved upon, which yielded the Staff Performance Evaluation System.

Conclusion

This study has proven beyond doubt that the use of a staff performance evaluation system is a vital tool that can be employed in the measurement and enhancement of staff productivity. Findings from this study further proved that if there is a task management system, productivity, and efficiency will be enhanced because of task evaluation and quality delivery of each assigned task.

Bibliography

1. Piana V. "Productivity" (2001).
2. Wilson. Key concepts in information and knowledge management (2002).
3. Kanchev KD. "Employee management system". Vaxjo University, Sweden (2006): 1650-2647.
4. Mustapha A. "Computerized staff record system: A case for WUFP-Birnin Kebbi (2016).
5. Arulogun OT., *et al.* "RFID-Based student's attendance management system". *International Journal of Engineering and Scientific Research* 4.2 (2006): 1-9.
6. Daugmann J. "The importance of being random: Statistical principles of iris recognition". *Pattern Recognition* 36.2 (2006): 279-291.
7. Vishal B., *et al.* "Bluetooth base attendance management system". *International Journal of Innovations in Engineering and Technology (IJJET)* 3.1 2319-1058.
8. Rozario MA. "Employee database and payroll management system". M.Sc. Thesis, RCC Institute of Information Technology Affiliated to Maulana Abul Azad University of Technology. Beleiahat, Kolkata.
9. Simaanya M. "Employee management system". Ph.D. Thesis, University of Zambia school of natural science, Zambia.
10. Singhal U., *et al.* "The study to design system for scheduling activities in a work center". *Research Gate* (2019).