DEAK's Employee Attendance Management System

A Case Study

Presented to

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In Partial Fulfillment

of the Requirements for the Subject

Information Management

by

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Table of Contents

Pages

INTRODUCTION OF THE STUDY

i. Background of the Study 3

METHODOLOGY

i. Description of the Proposed Study 7

ii. System Architecture 9

iii. Database Design 13

RESULTS AND DISCUSSION

i. Implementation 15

ii. Results Interpretation and Analysis 26

REFERENCES 31

INTRODUCTION OF THE STUDY

Background of the Study

Employee time and attendance tracking is a must-have for any firm. However, choosing the finest potential time and attendance system is frequently disregarded. Running a business takes time, and it can be difficult to take a step back and consider the many types of attendance systems available and how they can help their users (Rasan, 2019).

A manual attendance system is a method of manually documenting attendance data, for example using a paper sign-in sheet or a ledger. It entails physically marking each individual's attendance, which is then manually tallied and processed. The typical sign-in sheet used by firms, where employees sign in upon arrival and sign out when departing, is an example of a manual attendance system (Harris, 2018).

Over the years the manual attendance management system has been carried out on most educational or business institutions until today and by that alone it has resulted into various occurrences such as human errors, due to the fact that there are always certain circumstances wherein the employees can make mistakes by not punching in the correct date and time, and there are gonna be times where

the employees will come to you asking why they receive less salary than the hours they've worked, only for you to lose a huge amount of revenue without even knowing it (Timerack, 2022).

Even though having a manual attendance system has been considered as cheap, simple to use, resistant to power outage it has also been reported as a way wherein data manipulation is rampant. Wherein the employees may put wrong information in order to garner extra wages. Moreover, this can create a "Time Theft" condition as well (Bajpai, 2020). Not only by that it has also been reported to be time-consuming and as well as ineffective and outdated.

With the surge of modernization and globalization, it is now necessary for businesses to implement an automated employee management system in order to monitor the large number of employees' daily attendance, increase their work efficiency, and produce a more accurate payroll for their employees based on their hours of work on a daily basis (Bajpai, 2020). Compared to the traditional attendance system an automated employee attendance system is far more convenient for both the employee and the owner.

Using this type of technology, an employee can log in and out of their individual offices more easily and quickly

than filling out a paper form by hand. It addresses the needs of the personnel department in terms of day-to-day staff monitoring, overtime calculation, and transfer of important information to the payroll system, as well as manpower analysis. As a result, the Employee attendance management system is a significant issue that every firm must consider in order to be productive (Kadry & Smaili, 2017).

The name DEAK was inspired by the first letter of the members' names. D for Daxen, E for Eugene, A for Alexandra, and K for Kyle who were bonded and created this system together, then used the name itself for this biometric attendance system project which symbolized for the organized efforts of the ever supportive members of the group and to prove that with the help of each other we can conquer any challenges that come our way.

The developers created the Employee attendance management system for the business establishments experiencing employee attendance management problems so that they could have a more precise set of inputs regarding the time in and time out of their personnel and produce a more accurate paycheck for their employees. According to some business such as the JClear Water Refilling station,

they are currently experiencing difficulty tracking the time in and time out of its large number of employees from both of its branch locations and according to the owner of the aforementioned refilling station, Mr. Jose Eduardo Fernandez, this problem has caused the HR department to have a difficult time monitoring the attendance of its employees since they are using a paper-based system to store the records of the employees while also having difficulty calculating the accurate amount of salary to be given based on the working hours stored on the records.

One of the features of the aforementioned Employee attendance management system is the access control function, which prevents unauthorized personnel from accessing the system by providing a unique username and password to the official administrator of the said establishment. Even though this company has a maximum of 20 employees, we believe that having a high capacity employee attendance management system is essential in order for the system to be capable of accommodating the needs of the company as it grows and adds more employees in the near future. This system was also developed to have a fast employee authentication, allowing the firm to avoid long employee queues. This system was also designed to export a

pdf file which contains all the attendance activity of the employees, including their registered shift, first name and last name, date of attendance, employees' time-in and out, employee id, and as well as their status which is going to determine whether that employee was late, absent or present on his working hours. The system only allows the user time-in and time-out once in a day to prevent human errors.

METHODOLOGY

Description of the Proposed Study

This study, in general, is aimed to provide solutions on the employee attendance management problems that modern businesses experience nowadays, especially problems such as keeping track of the large number of personnel time in and time out. As well as problems experienced upon using a traditional attendance taking with the use of pen and paper.

This is where the study was put into an assistive system wherein it accurately tracks the employee attendance on a daily basis. This system can also help organizations to monitor and analyze employee attendance patterns, identify attendance-related issues, and take necessary actions to address them.

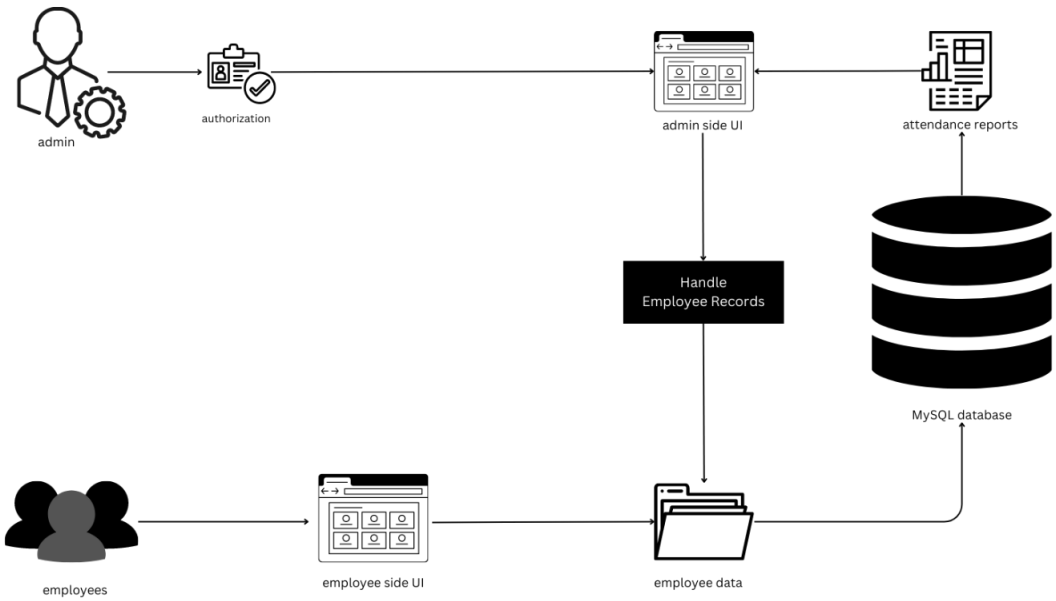
With the help of this system, businesses can now efficiently track the attendance of its employees, eliminating the need for manual attendance tracking that can be time-consuming and prone to errors. It'll also provide accurate record keeping because the system's data and information gathered from all of its employees will be stored on a MySQL Database and will only be accessible by the authorized personnel of the said establishment.

Having this kind of system onboard will also help organizations identify trends and patterns in employee attendance, enabling them to take necessary actions to improve productivity, reduce absenteeism, and increase engagement. It can also help with saving costs related to employee attendance, such as overpayment for absenteeism or unnecessary overtime payments. Overall, an assistive system for employee attendance tracking can be a valuable tool for organizations looking to optimize their workforce management processes and improve overall efficiency.

This study aims to develop a student enrollment system that implements the Deque (Double Ended Queue) algorithm in order to easily access the details of the said employee either in the front or at the back of the system. The researchers included the development of an employee

attendance management system that highlights the admin and employee approach. The researchers have used a labeled scaled-response questionnaire for feedback, a database server, a prototyping tool and a programming language that is suited for the development of the proposed application.

System Architecture



This interprets the bird’s eye view of the application’s system architecture. The process initiates when the user logs in as either the administrator or the employee. When a user logs in as an administrator, the system will prompt them for their username and password

which are exclusively given by the higher authorities for security purposes in order for them to have administrator privileges on the system. Once confirmed, he will be redirected to the administrator dashboard, which displays various tables containing information about the total number of employees per department as well as the total number of employees per shift. The user will also see the total number of employees, departments, shifts, and attendance records on the dashboard. The user has the option to sign out of the administrator dashboard of the specified system in the upper right corner of the dashboard.

The navigation bar is displayed at the top of the dashboard for the user's convenience when navigating the system. The administrator has the authority to add a certain department and shift that will serve as the foundation for employees setup in his or her own department and shift. When a user navigates to the department portion of the administrator dashboard, he will see all of the departments that have been registered on the system, as well as the ability to add, search, update, and delete a department. When adding a department, the system will prompt the user to provide the department code and name of

his choice.

The shifts portion of the administrator dashboard displays all of the shifts that have been registered on the system. A shift can be added, updated, or deleted by the user. The user can also search for a certain shift based on any of the information that was displayed on the table. When you add a shift, the system will prompt you for the start and end times of that shift.

When you click the employees section on the administrator dashboard, the system displays all of the registered employees along with their personal information such as the employee id, first and last name, position, department, shift, and employee image. The user can also search for any set of data on the employee table by only typing any of the information that was displayed on the table. The user also has the power to add, update, and delete that employee. If the user selects the add employee option, he will be taken to a form in which he must fill out the employees' first and last name, shift, position, department, image, and password, which will be required for employee registration, as well as for the employees' activity when timing in and out. When the user clicks the update button, a form with that employee's information is

displayed, and the user can alter any information he wishes.

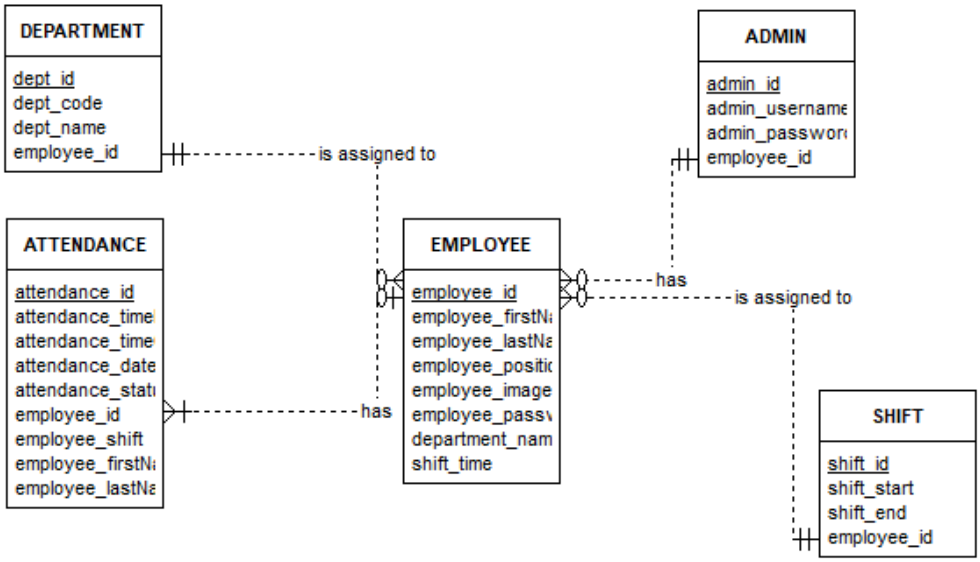
By selecting the attendance option from the administrator dashboard's navigation bar, the system will display a table containing all of the employees' attendance activity, including their attendance ID, date of activity, time-in, time-out, status, employee id, and first and last names. The user can also search for that specific employee based on any information presented on the table. In this section the administrator also has the ability to export a record, by clicking the export button the system will create a pdf file containing all the information in the table.

If the user wants to sign in as the employee and mark his time-in or time-out, he will be sent to a form where the system will ask him for his employee ID as well as the password on which the administrator has provided for security purposes. The system will only allow the employee to time-in and time-out once a day in order to limit, and control their attendance activity as well as preventing certain human errors in the future.

All of the information entered by the administrator, as well as the activity of the employees, will be stored in

the MySQL database, which will be utilized to store a wide range of information.

Database Design



The database consists of five tables, each representing a specific entity and its attributes. First, the `admin` table stores information about the administrators. It includes attributes such as 'admin_id'(PK), 'admin_username', 'admin_password', and 'employee_id'(FK). Second, the `attendance` table contains the attendance details of employees. The attributes are 'attendance_id'(PK),'employee_shift'(FK),'attendance_date', 'attendance_timeIn','attendance_timeOut','attendance_status ','employee_id'(FK),'employee_firstName'(FK), and

'employee_lastName'(FK). Third, the `department` table stores information about the different departments. It includes attributes such as 'dept_id'(PK), 'dept_code', 'dept_name', and 'employee_id'(FK). Fourth, the `shift` table contains information about different shifts used in the organization. It includes attributes such as 'shift_id' (PK),'shift_start','shift_end', and 'employee_id'(FK). Lastly, the `employee` table represents the employees currently in the system. It includes attributes such as 'employee_id'(PK),'employee_firstName','employee_lastName', 'employee_position','employee_image','dept_name'(FK),'shift _time'(FK), and 'employee_password'. The 'shift_time' attribute is a concatenation of the attributes 'shift_start' and 'shift_end' from the `shift` table.

Within the ERD, there are four relationships in total. First, the `admin` has a one-to-many relationship with the `employee` as one admin is associated with one or more employees. In this relationship, the `admin` is mandatory while the `employee` is optional. Second, the `attendance` also has a one-to-many relationship with the `employee` as an employee can have multiple attendance records. In this relationship, the `attendance` is mandatory while the

`employee` is optional. Third, the `department` has a one-to-many relationship with the `employee` as a department can have multiple employees assigned to it while an employee can only be assigned to a single department. In this relationship, the `department` is mandatory while the `employee` is optional. Lastly, the `shift` also has a one-to-many relationship with the `employee` as a specific shift can have multiple employees assigned to it while an employee can only be assigned to a single shift. In this relationship, the `shift` is mandatory while the `employee` is optional.

RESULTS AND DISCUSSION

Implementation

The figures that follow depict the system's collection of user interfaces. The front-end design, which is made of those interfaces, will be the channel for the user to communicate with the system; below are the screenshots of the system's user interfaces:

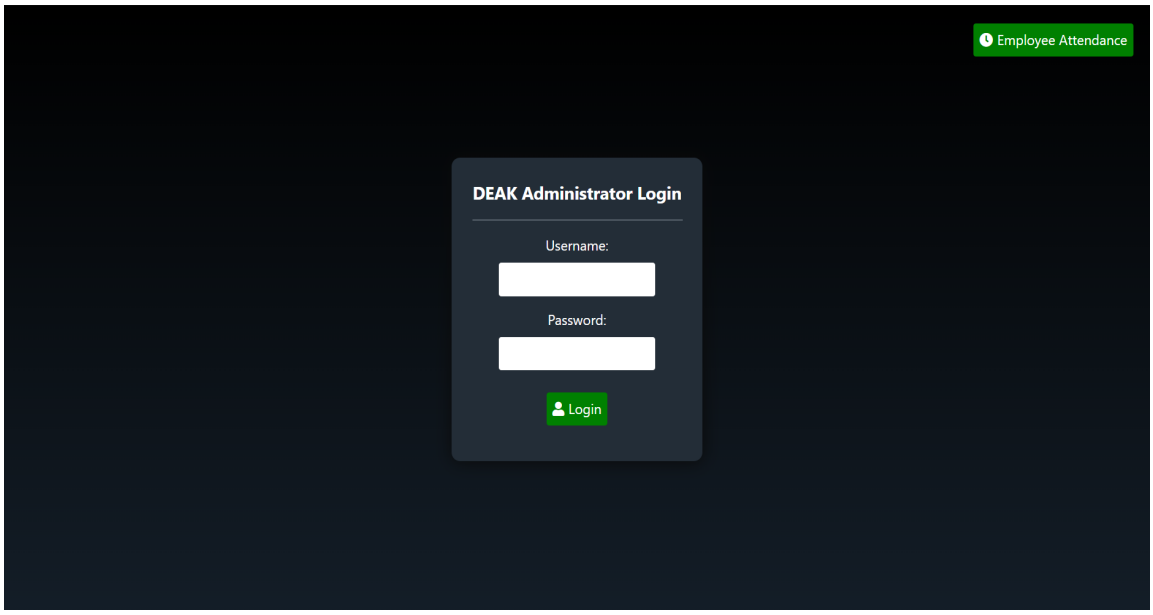


Figure 1: Administrator Sign-in

If the user wants to sign in as the administrator, the system will ask for his username and password to truly confirm if that user has authorized administrative privileges. If the user wants to check his attendance as an employee of the said establishment, the system will ask for his username and password. The owner only gives the username and password of the system's administrator to the entrusted staff members.

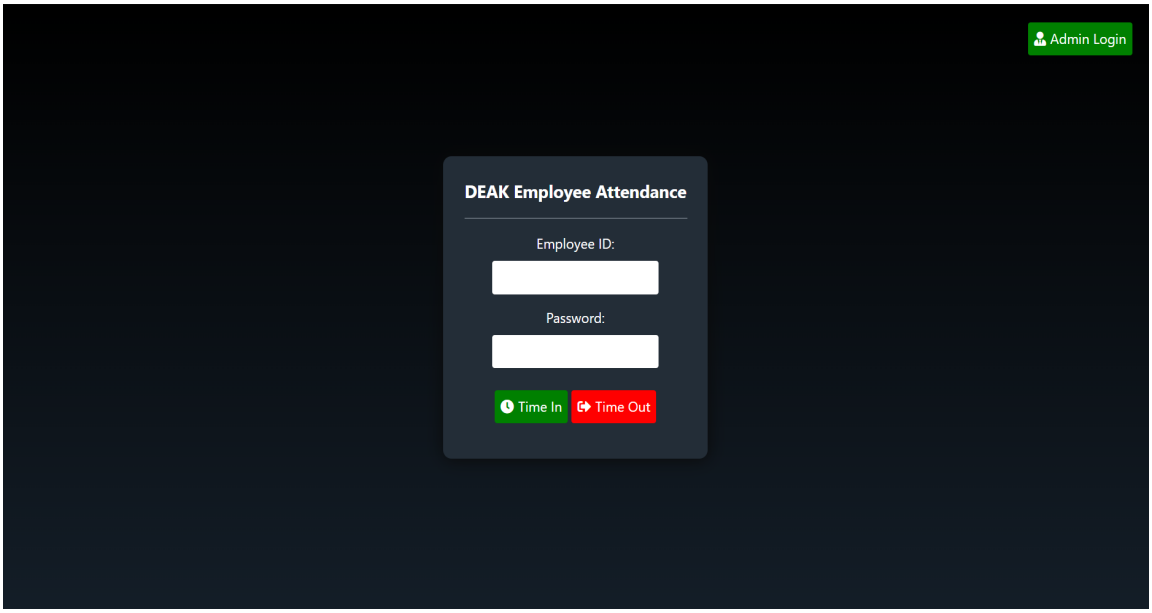


Figure 2: Employee Attendance

This is the first screen the user would see if he wishes to check his attendance as an employee of the given establishment. In this section, the system will request his employee ID and password, which were only provided by the administrator. After completing the form, the user can select whether he wants to time-in or time-out throughout his shift.

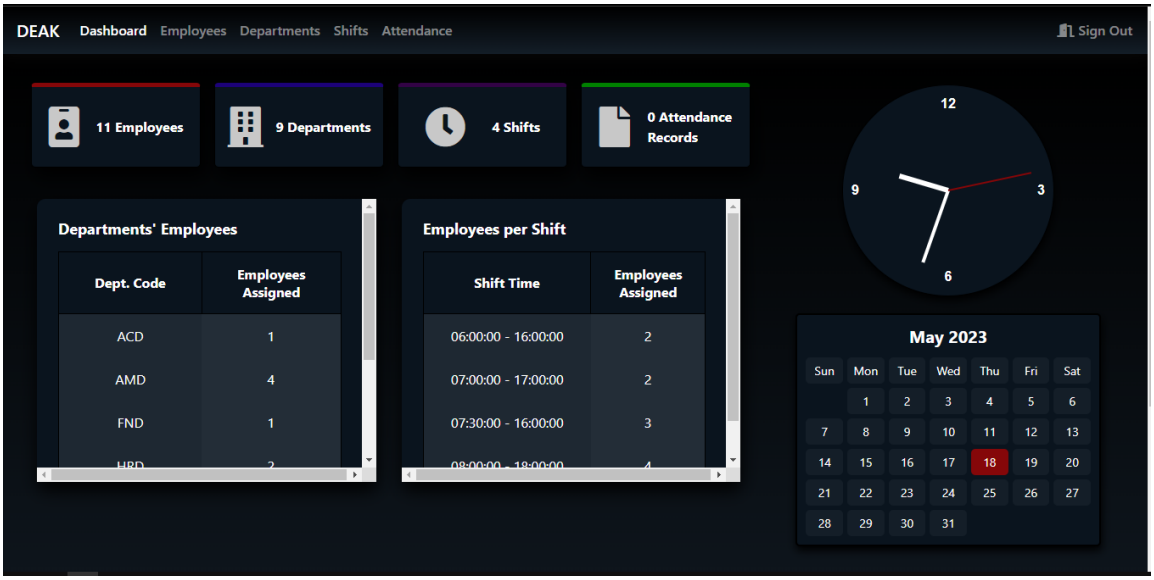


Figure 3: Administrator Dashboard

The user will be sent to the administrator dashboard after successfully logging in as the administrator using his username and password. The system name "DEAK" can be seen in the upper left corner of the Figure which when click will automatically redirects the user to the administrator dashboard, and next to it is the navigation bar, which contains the dashboard, employees, departments, shifts, and attendance, all of which have their own sets of operations in the system. On the upper right corner of the aforementioned figure is a sign out button, which the user can utilize to quit the system's administrator portion.

The administrator dashboard also shows the total number of departments, employees, shifts, and attendance records, as well as the total number of employees, shifts,

and attendance records.

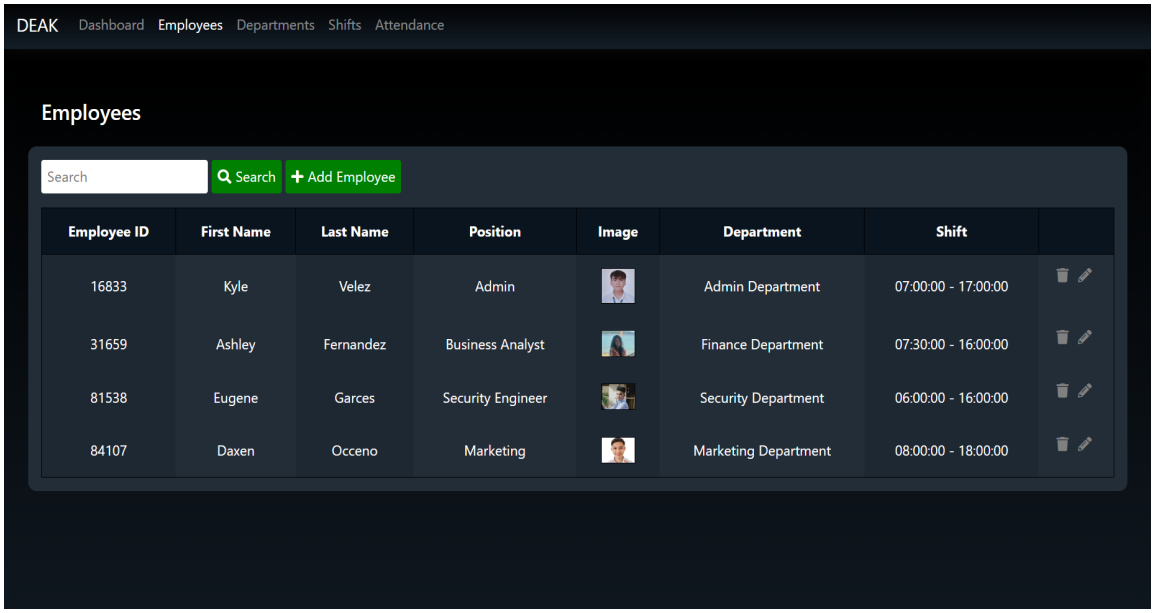


Figure 4: Employees

This figure shows the list of all the employees that were registered in the system together with their personal information such as their unique employee ID, first and last name, position, image, department and shifts. The user also has the power to search, add, update and delete an employee as well.

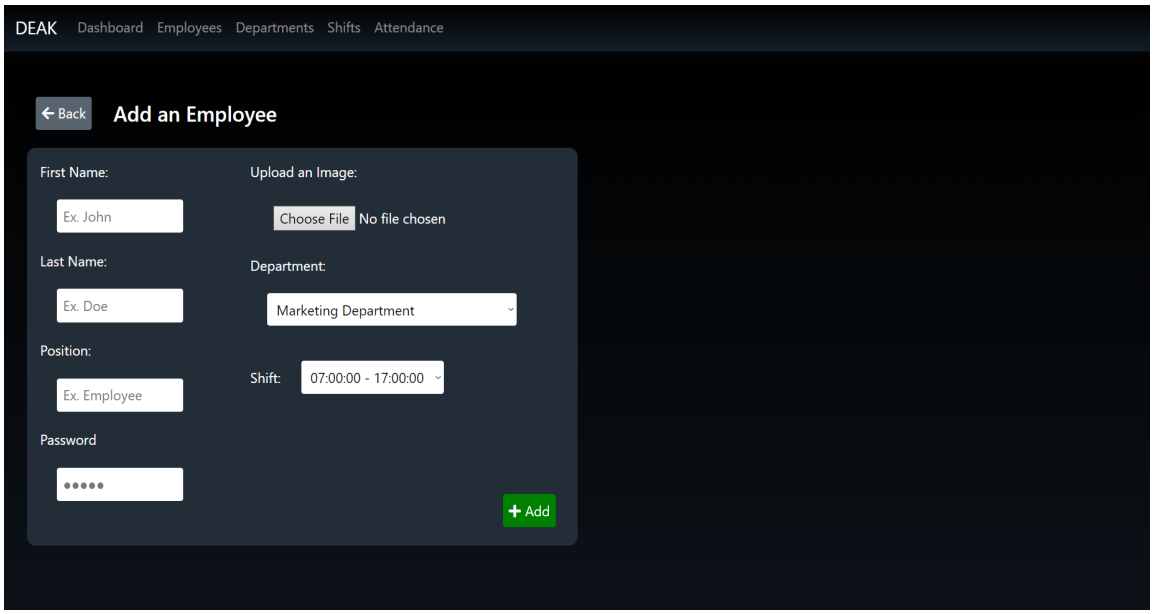


Figure 5: Add Employee

This diagram will appear when the administrator intends to include a new employee. Within this form, the system will prompt the user to input essential details, including their first and last name, position, department, shift, password, and an image that will serve as the employee's profile. By clicking the "add" button, situated in the bottom right corner of the form, all the filled user information will be stored in the MySQL database.

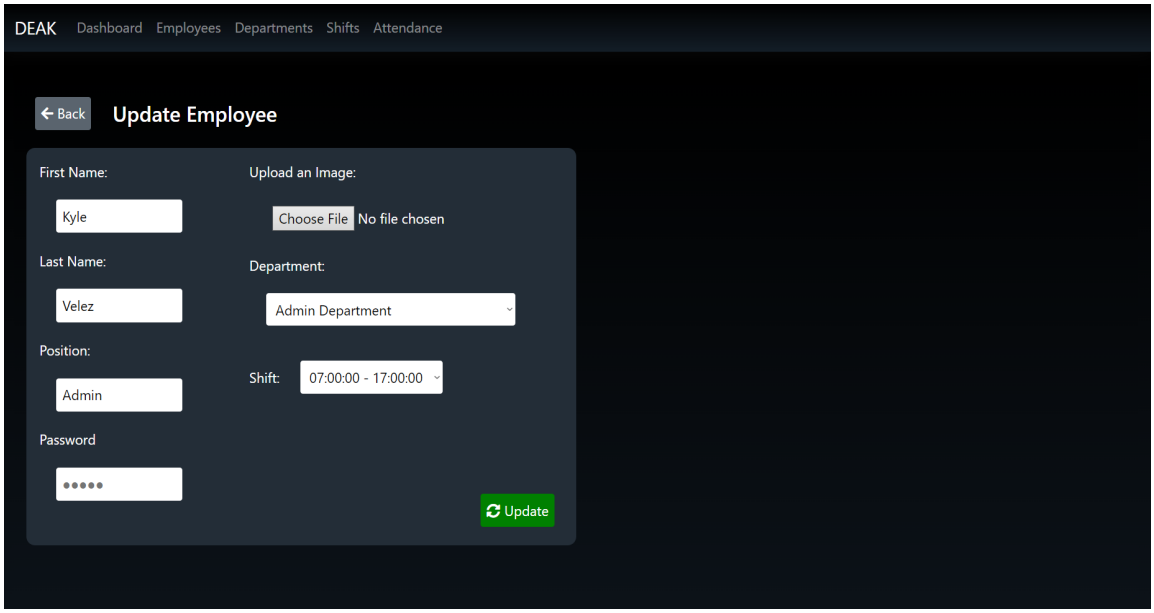


Figure 6: Update Employee

When the user chooses to modify the details of a particular employee, a form containing pre-populated information will be displayed. This form is automatically filled by the system based on the previously entered information by the user, and it includes the employee's

first and last name, position, department, password, shift, and the employees' image. After making the necessary changes, the user can click the submit button to save the updated information to the MySQL database.

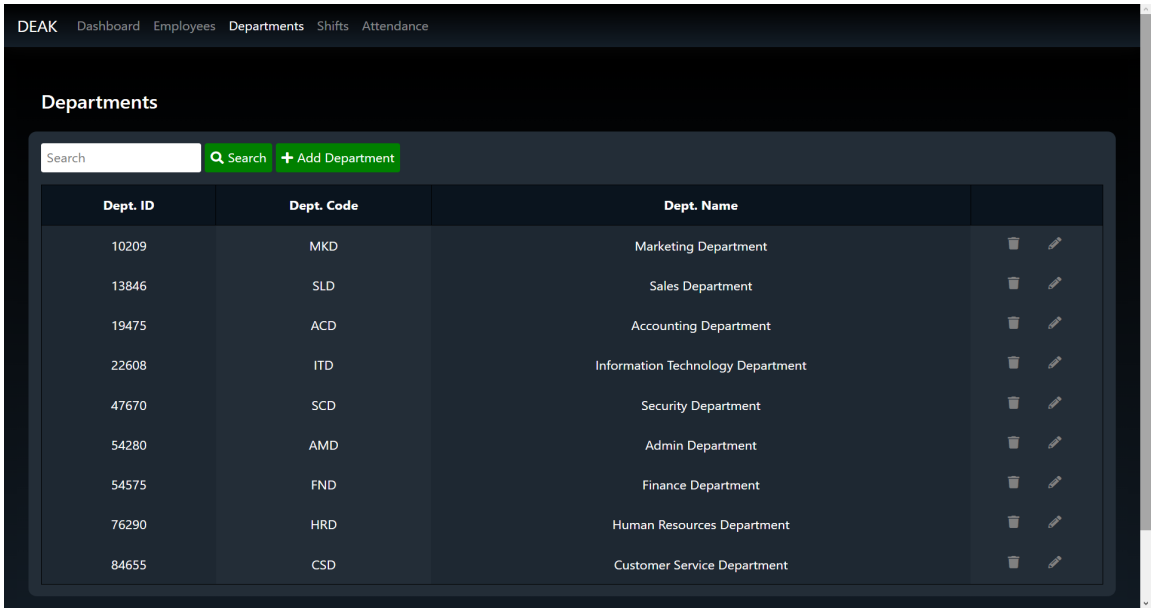


Figure 7: Departments

If the user clicks the department area in the navigation bar, this figure will be displayed. The department area displays all of the registered departments that the administrator has added, and he also has the ability to add, update, search, and delete specific departments.

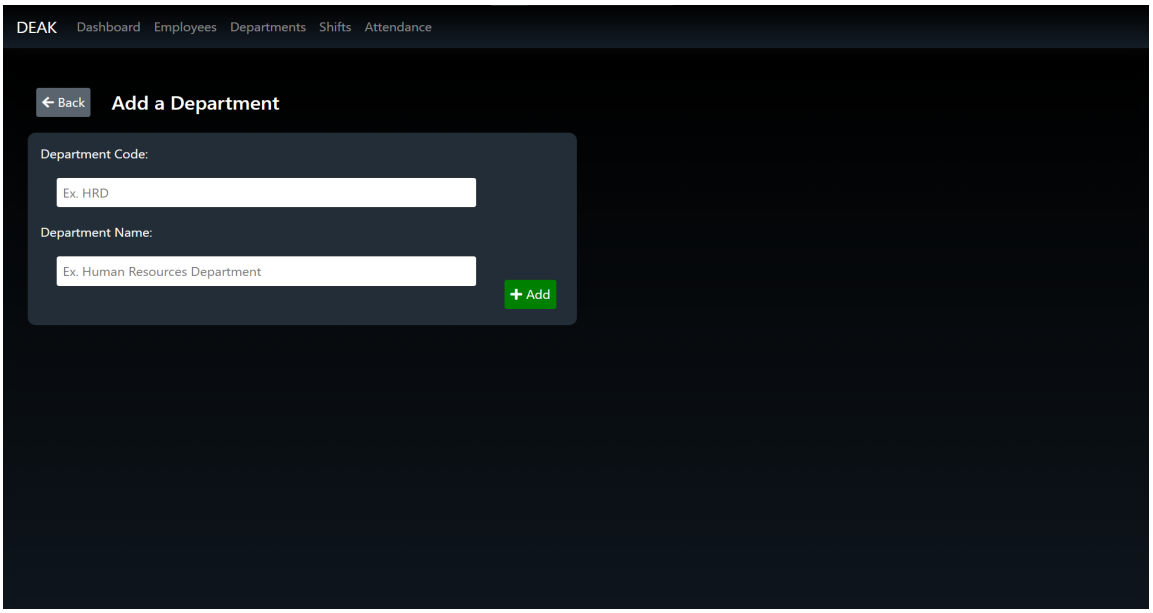


Figure 8: Add Department

This figure will be presented whenever the user clicks the department section in the navigation bar. The department area shows all of the registered departments that the administrator has added, and he can also add, change, search, and delete specific departments.

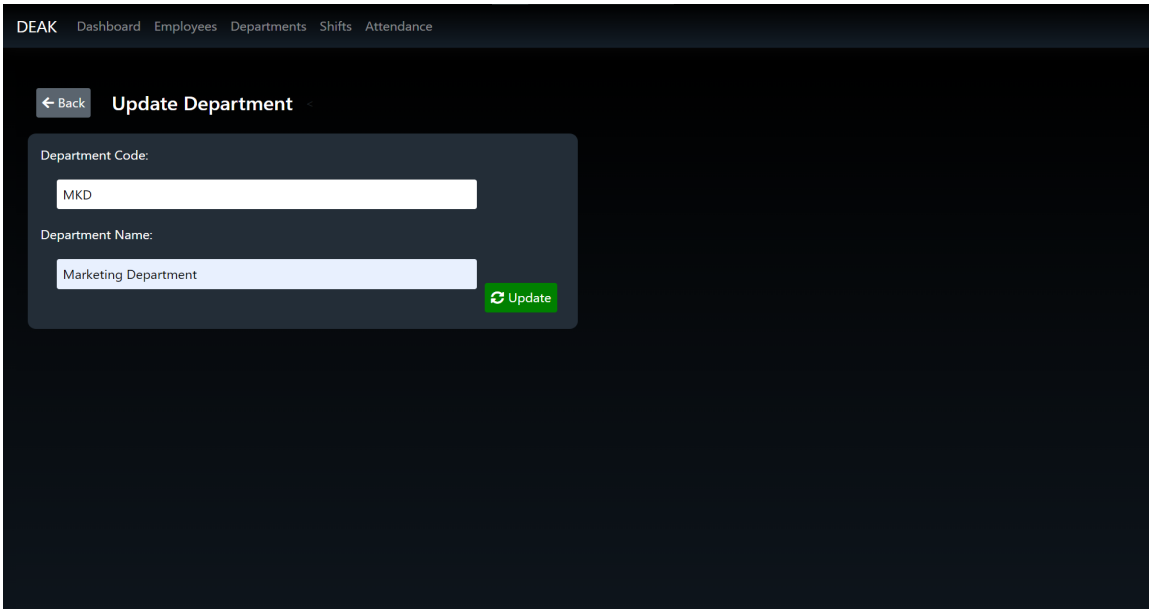


Figure 9: Update Department

When the user clicks the update department button, the system will lead him to an auto filled form with the information that he previously input, and he can also alter any of those details to his satisfaction.

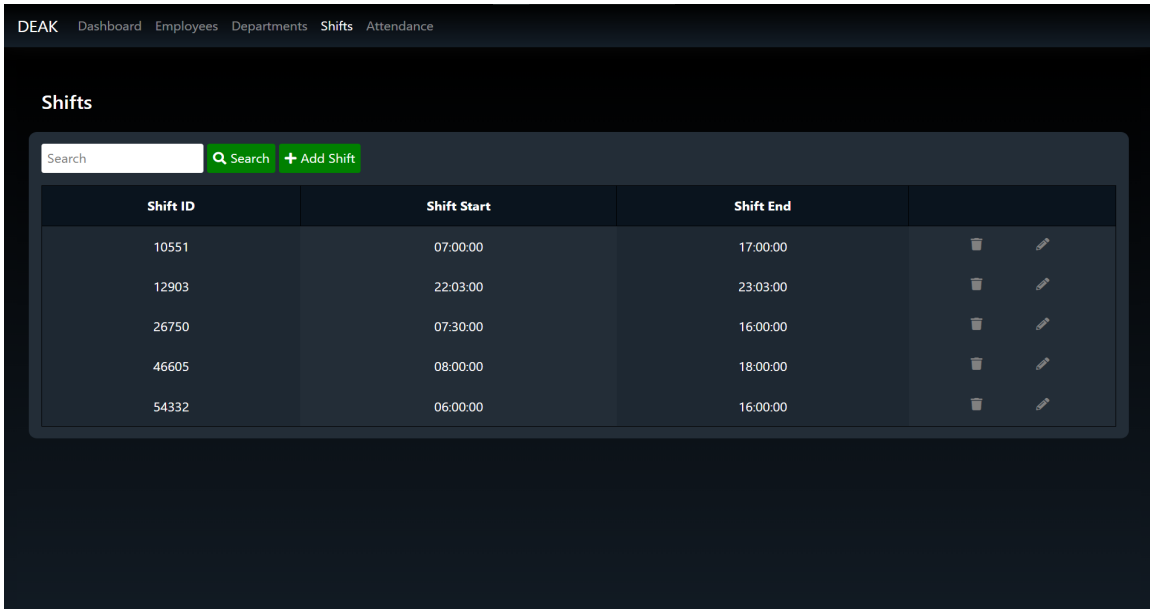


Figure 10: Shifts

If the user clicks the shifts section in the navigation bar of the system, this figure will be displayed showing all the shifts added by the administrator as well as the option to add, update, search or even delete a certain shift on his liking.

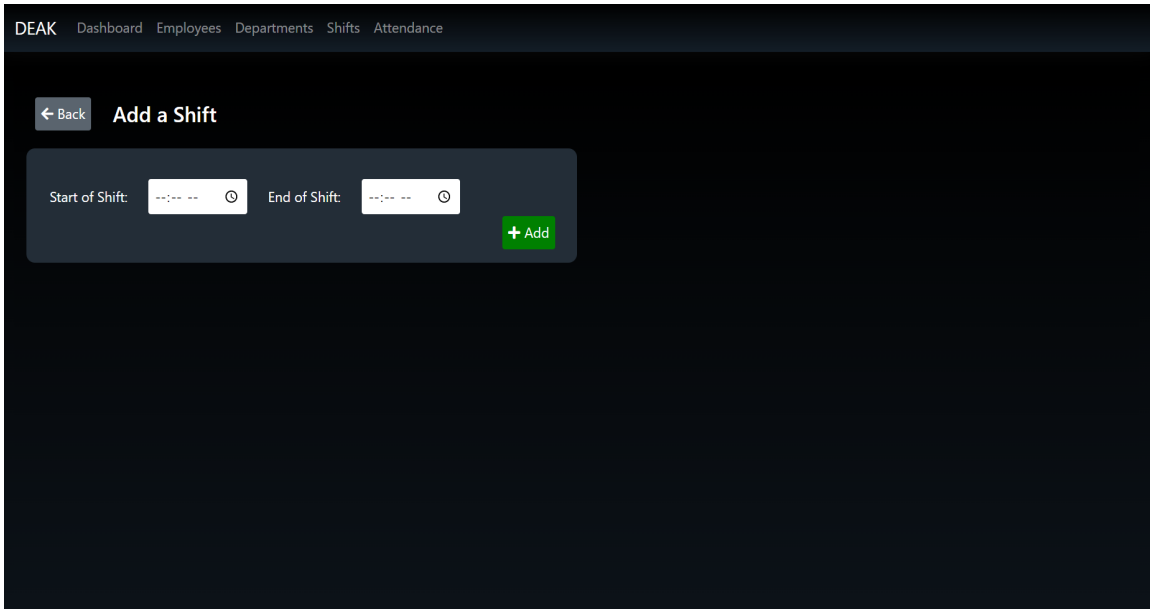


Figure 11: Add Shift

This figure pops up if the user clicks the add shift option, then the system is going to ask the user to enter his desired time start and time finish for that specific shift.

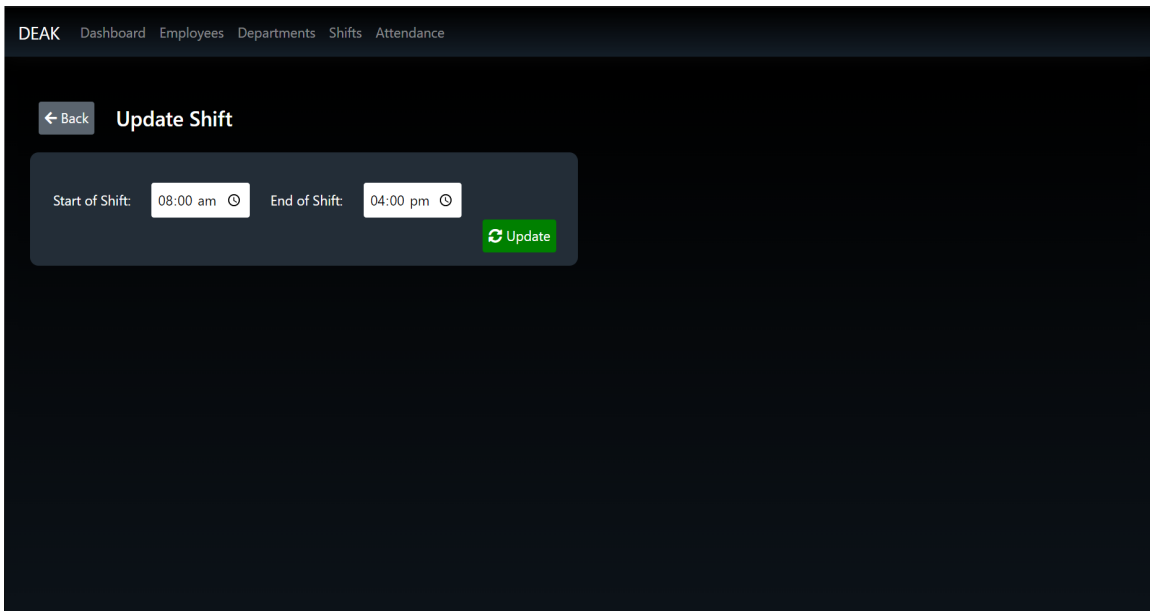


Figure 12: Update Shift

When the user clicks the update button in the shifts section, an auto-filled form with the previous shift information that the user has entered appears, and the user can now change any of that information to his liking.

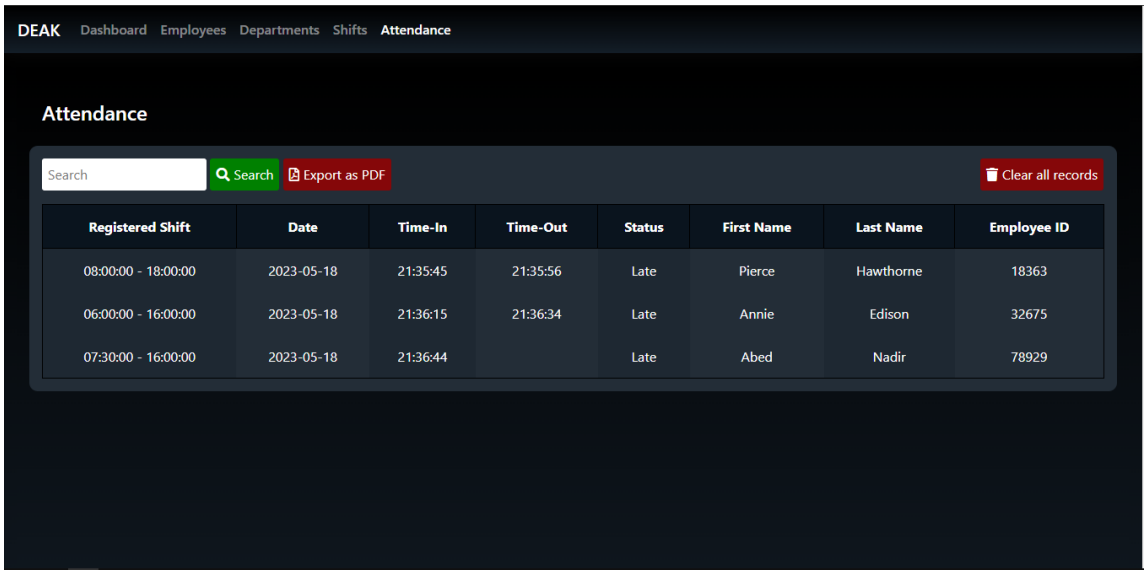


Figure 13: Attendance Record

After selecting the attendance area from the navigation bar. A table will be displayed that shows all of the attendance activity of each employee on a daily basis. The table displays the registered shift of the employee, date of activity, time-in, time-out, status (late, present, or absent in his relevant shift), employee ID, first and last name. The user can also search for specific information in the table, as well as delete all the

information inside the table as well. The export as pdf button has the function to generate a pdf file which contains all the information in the table be incorporated in that pdf file.

Results Interpretation and Analysis

In this study, a simple random sampling method was used to select employees from the JClear Water Refilling Station for the study. Information collected from all participants was carefully processed to ensure unbiased results. Researchers have also used Google Forms to collect data containing personal information and their preferred type of employee attendance taking.

The researchers made sure to get the consent of the respondents before distributing survey questionnaires. The researchers assured that the respondents were fully informed about the study's objective, the scope of its use of the results, and the purpose of its future usage. The internet arrangement used to conduct the remote survey to the participants allowed them to take their time and complete it comfortably.

A total of 10 respondents were surveyed as shown on Figure 1. Most of the respondents were aged 30 and 29, the

oldest respondent were aged 35, while the youngest was 28. In terms of position in the said water refilling station the 4 of the respondents had a position of customer service representative while the least number of respondents in terms of position was 1 and that was the water technician and the maintenance technician. Most of the respondents were single, and only 3 of them were already married. In terms of hometown location most of them come from the rural areas (60%) in Western Visayas.

CHARACTERISTICS	FREQUENCY	PERCENTAGE
AGE		
35	2	20%
32	1	10%
30	3	30%
29	3	30%
28	1	10%
POSITION		
WATER TECHNICIAN	1	10%
DELIVERY DRIVER	2	20%
ACCOUNTS OFFICER	2	20%
MAINTENANCE TECHNICIAN	1	10%
CUSTOMER SERVICE REPRESENTATIVE	4	40%
STATUS		
SINGLE	7	70%
MARRIED	3	30%
SEPARATED	0	
WIDOW	0	
HOMETOWN		
URBAN	4	40%
RURAL	6	60%

Table 1: Characteristics of Respondents

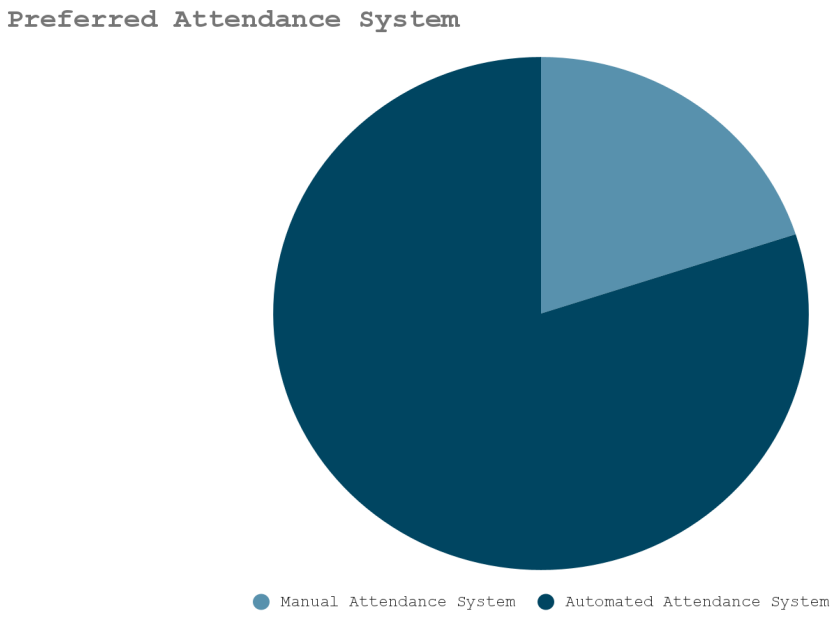


Figure 1: Graph on Preferred Attendance System

Based on the results of the survey shown on figure 1, 8 employees of the JClear Water Refilling Station or a total of 80% preferred the automated attendance system and only 2 voted for the manual attendance system which only has a percentage of 20%. Majority of them agree that an automated attendance system is a much better option compared to the manual attendance system because it is a much more accurate form of attendance taking since it eliminates human errors such as miscalculations, data entry

mistakes, or falsification of attendance record.

ISO 25010	Overall Mean	Interpretation
Functional Stability	4.5	Very Good
Reliability	4.0	Good
Portability	4.2	Very Good
Usability	4.3	Very Good
Performance Efficiency	4.4	Very Good
Security	4.0	Good
Compatibility	4.1	Very Good
Maintainability	4.4	Very Good

Table 2: ISO 25010 Results Gained from the 10 Respondents

Scales of Mean	Description
5 - 4.1	Very Good
4 - 3.1	Good
3 - 2.1	Fair
2 - 1.1	Poor
1	Very Poor

The results indicate that the said system achieved an overall “Very Good” rating based on the ISO 25010 standard garnering an overall mean of 4.2375, as shown in the table above. Precisely among the eight quality requirements, the Functional Stability has the highest mean value of 4.5 conforming within the range of the “Very Good” rating. Portability, Usability, Performance Efficiency, Compatibility and Maintainability also has garnered a “Very Good” rating. While the rest of the requirements which are Reliability, and Security have attained a “Good” rating.

Results were able to conclude that the conducted quality evaluation is successful and therefore attests to the quality of this attendance system in providing implied needs to its users.

REFERENCES

Bajpai, K. (2020). Manual vs Automated Attendance System: Comparison. SoftwareSuggest Blog. Retrieved from: https://www.softwaresuggest.com/blog/manual-vs-automated-attendance-system-pros-cons/#

Bhatia, S. S., & Sharma, S. (2018). Employee Attendance Management System Using Biometric Device. International Journal of Scientific Research in Computer Science, Engineering and Information Technology, 3(2), 75-80.

Harris, S. (2018). Managing attendance: What every employer should know. CCH Incorporated.

Hasan, M. R., & Ali, M. (2020). Development of an Attendance Management System using Face Recognition Technique. International Journal of Advanced Computer Science and Applications, 11(5), 393-399.

Hassan, S., & Asghar, M. Z. (2015). Web-based Attendance Management System. ResearchGate. Retrieved from:https://www.researchgate.net/publication/303023739_Web-based_Attendance_Management_System

JOSSO 2 by Atricore. (n.d.). Retrieved from: https://www.shrm.org/resourcesandtools/tools-and-samples/toolkits/pages/managingemployeeattendance.aspx

Lakshmi, T., & Kumar, V. V. (2017). Smart Attendance Management System Using Android Application. International Journal of Engineering and Technology, 9(1), 69-73.

Nym. (2022). Employee Attendance Management System Project Report (PDF). Itsourcecode.com. Retrieved from: https://itsourcecode.com/fyp/employee-attendance-management-system-project-report-pdf/?utm_content=expand_article

Timerack. (2022). Manual vs Automated Time and Attendance Systems: Which is Best For Your Business? Timerack. Retrieved from: https://timerack.com/blog/manual-vs-automated-time-and-attendance-systems/