Applied Information Technology And Computer Science Vol. 5 No. 1 (2024) 1141-1157

AITCS

Homepage: http://publisher.uthm.edu.my/periodicals/index.php/aitcs
e-ISSN :2773-5141

Tekun Resmi Staff Management System

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DOI: https://doi.org/10.30880/aitcs.2024.05.01.064
Received 23 June 2023; Accepted 18 June 2024; Available online 30 August 2024

Abstract: The company Tekun Resmi Sdn Bhd is now operating a cleaning service business and due to a lack of technological expertise, they had difficulty managing staff information by physically recording staff data and keeping it in files or on documents. The objectives of this project are to design, to create management system by using web-based approach and to test the web-based staff management system. This project's activities are guided by the waterfall development method and the system is built with Visual Studio Code and phpMyAdmin as database. This system consists of four functional modules, including staff information, attendance, leave, and payroll, and there are two different types of users: administrators and employees. The administrator can view staff information such as leave, attendance, salary, and personal details, other than that the administrator can also handle salary and leave applications submitted by employees. The system also allows staff to key-in their attendance, apply for leave, update information and view salary and personal information. In generally, the system works as a platform to strengthen interactions between employers and employees and enhances the effectiveness of the company's staff's management system. It will be easier for the company to manage all the information efficiently and effectively.

Keywords: Staff Management System, Web-Based System, Waterfall

1. Introduction

The use of manual or physical processes by the organization to manage employee data is no longer relevant. This is because handling large amounts of data manually is tiresome and time-consuming. A staff management system that converts manual processes to a computerized helps streamline the task and securely store and manage staff data in the database. The purpose of this project is to create a system that will enable the business to address all employee-related issues more systematic and effectively.

Tekun Resmi Sdn Bhd, is a business founded in 2018 and based in Ampang, Selangor, offers cleaning services to its customers. There are a few different kinds of cleaning services, but Tekun Resmi Sdn Bhd only offers janitorial cleaning services. Due to an inefficient management system, the company regularly faces trouble accessing staff data and updating information due of the company's outdated

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processes. The organization must switch to another processes that is more effective and secure because maintaining data in manually processes carries a high risk of data loss and damage.

Tekun Resmi Sdn Bhd keeps staff information on file because it is physically written on paper by staff during their registration day. The staff struggles to update the data when using this method on 20s. Furthermore, punch card method is still used to record staff's attendance, and staff's payroll will be based on the attendance of the staff. The company's payroll method also requires manually calculating

Therefore, this project target is to design management system by using structured approach, to create management system by using web-based approach and to test the web-based staff management system. In other hand, the target user of this system is administrator and staff of Tekun Resmi company. There are seven modules for develop this system which are register module, login module, staff information module, leave application module, report module, salary module and attendance module.

2. Related Work

2.1 Web Based Information System

A web-based information system is an information system that uses Internet web technologies to send information and services to users. The web-based apply of Education (WBE) which requires proper support of information systems. For the WBE, a lot of research has been done in the field of information technology starting from the design, delivery, use and effective assessment of information technology in organizations and society [1]. Besides, the development of information system is carried out by several stages, where each stages produce a more detailed from previous stage. Furthermore, a System Development Life Cycle (SDLC) is required to set up an information system because it is a structured approach to software development and reduces risk. Besides, SDLC also designed with clarity, which mean project members cannot skip one stage to another until the stage is completed and signed off by the project manager [2].

As a result, the web-based staff management system is important to raising educational standards. In order to share any information, it is also accessible to the organization's workers. An information system is made up of several interconnected parts that gather, store, process, and analyze data in order to give users knowledge and information they can use.

2.2 Similar Management System

Organizations must keep up with current technological advances to avoid becoming obsolete. The volume of data and information that must be stored will grow over time. All personal information and significant data will be managed by a computerized system in the staff management system [3]. To make admin and manager responsibilities easier, the system should be able to manage the information and provide extra capabilities There are few systems that are similar which are Flex HR Management System, MR DIY staff management system and Payroll Panda. These systems provide features like managing staff information, record attendance, apply leave and manage report of staff performance. for staff. Studying this similar management system is helpful in developing a good staff management system. Table 1 shows the comparison between three similar systems with the proposed system which is Tekun Resmi Staff Management System and Table 2 illustrates phase and activity during system development.

Table 1: System's Comparison

System Feature	Flex HR	MR. DIY	Payroll Panda	Proposed
Registration	√	√	√	√
Personal Details Module	√	√	√	√
Leave Application Module	X	√	√	√
Attendance module	X	√	√	√
Report module	X	√	√	√
Salary module	√	√	√	√
Login module	√	√	√	√

Table 2: Phase and activity during system development.

Phase	Activity	Deliverable
Planning	• Identify problems, system development requirements, objectives, project scope, and methodology • Data flow diagram is built	• Proposal • Gantt Chart and DFD
Design	• Design the system interface and database • Collect and analyze information • Identify entities and relationship between entities	• System requirement • Interface and database • ERD • flowcharts
Implementation	Develop system and conduct testing on the system	• MySQL • PHP programming
Maintenance	Develop minor modification to improve the system	Maintenance of system
Presentation	Presentation of the system in front of panel	• Final report • Complete system

3. Methodology/Framework

The software process model implemented in the development of Tekun Resmi Staff Management System is waterfall model. According to this methodology, the development demands transition from one phase to the next arise after the previous phase has been accomplished in full [4]. It is to prevent any phases that could overlap, in order to shorten the duration of the development management system process. Table 2 show the activity of each phase.

3.1 Requirement Gathering and Analysis Phase

The goals and scope of developing staff management system are determined in the planning phase. The result of interview and observation were used to analyze the system requirements. Table 3 shows modules of staff management system.

Table 3: Modules of Staff Management System

Module	Function	User
1. Register	Manage registration for the system user.	Administrator
2. Login Module	Manage login for the system user.	Administrator, Staff
3. Staff Information Module	Contains personal information of staff	Administrator, Staff
4. Leave Application Module	Allow staff to apply leave in the system	Administrator, Staff
5. Attendance module	Record the attendance of staff	Administrator, Staff
6. Report module	Allow administrator to manages report for their staff	Administrator, Staff
7. Salary module	Display payroll for each month	Administrator, Staff

3.1.1 System requirements

Functional requirements are used to identify a system's purpose and how that purpose is expressed in terms of the exact actions taken to transform input into output. The non-functional requirements specify the standards by which the operating system will be judged by the system [5]. The functional and non-functional requirements for the suggested system are shown in Tables 4 and Table 5.

Table 4: Non-functional requirements

No	Requirement	Description
1	Operational	This system can be used in any web browser such as Chrome and Internet Explorer
2	Scalability	The system should allow assess the highest workload to support number of users at the same time
3	Security	User information is secured and user need to enter the correct username and password to log in to the system

No	Requirement	Description
4	Performance	The system should get access to internet easily

Table 5: Functional requirements

No	Module	Description
1	Register module	• The system should require Administrator to register for new account. • The system should display form to input the details to create an account for new staff.
2	Login module	• The system should allow Administrator and Staff to login the system via ID and password. • The system should allow only one Administrator and valid user to login the system. • The system should show error message to invalid user or wrong password.
3	Staff Information module	• The system should display a form to insert Staff personal details. • The system should allow Administrator to edit or update staff personal details. • The system should allow Administrator to delete any unused data. • The system should allow the Staff to display the data.
4.	Leave application module	• Administrator can manage the leave application form staff and view all the leave application records. • Staff are allowed to apply for the leave and view their personal leave whether is approved or not.
5	Attendance module	• The system allows Staff to clock in and clock out for their attendance. • The system should allow Administrator to display Staff's attendance details. • The system should allow Administrator to do update for the attendance. • The system should allow to generate the total of attendance.
6	Report module	• The system should allow Admin to input rate performance data for Staff. • The system should allow Staff to display rate performance data. • The system should allow any update for the report.
7	Salary module	• The system should allow Administrator to input salary details of Staff. • The system should display salary details to Staff. • The system should allow any update for payroll.

3.2 Design Phase

Under the design phase, a data flow diagram and entity relationship diagram are produced. The system's processes and the data flow inside each process are described by DFD. The context diagram for the suggested system is shown in Figure 1. The three entities in the context diagram are the administrator and staff. Figure 2 illustrates the DFD level 0, while Figure 3 displays the ERD.

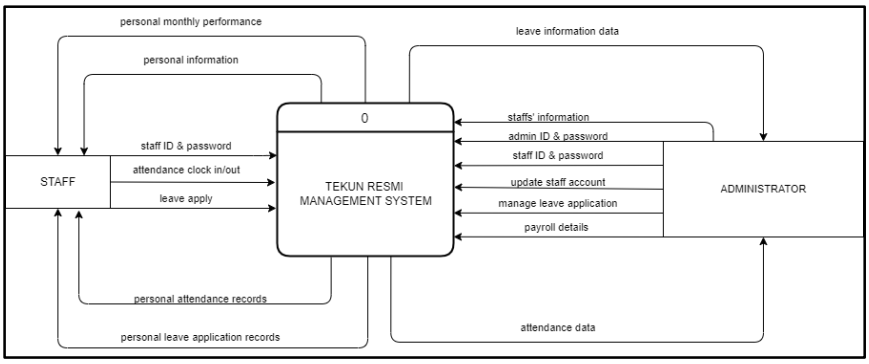

Figure 1: Context diagram

3.2.1. Data Flow Diagram (DFD)

Figure 2 shows the proposed system's DFD level 0, which illustrates the user's interaction with the system as well as the overall system process flow. There are two categories of users shown in the diagram: staff and administrator. After registering for an account and logging in, staff and administrator may access the system and the function modules inside it.

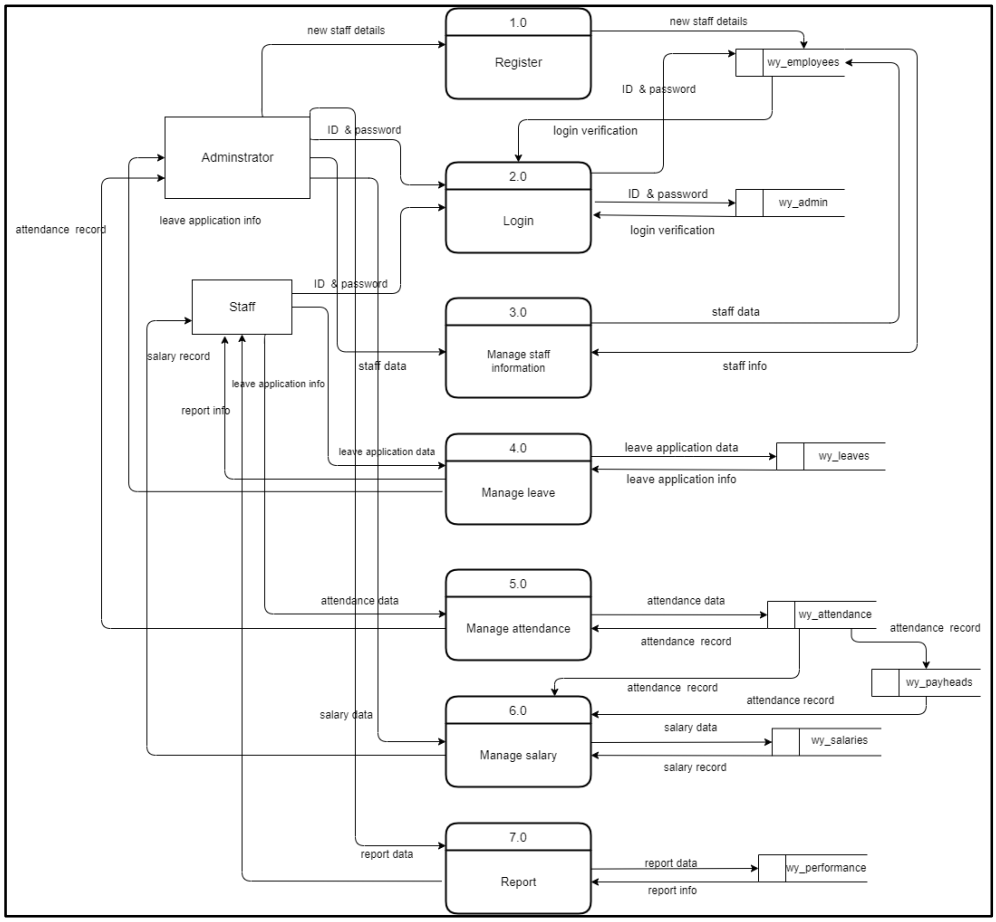

Figure 2: DFD Level 0

3.2.2 Entity Relationship Diagram (ERD)

Entity Relationship Diagram (ERD) is a type of structural diagram for use in database design. An ERD contains different symbols and connectors that visualize important information. Figure 3 shows the ERD of Tekun Resmi Management System.

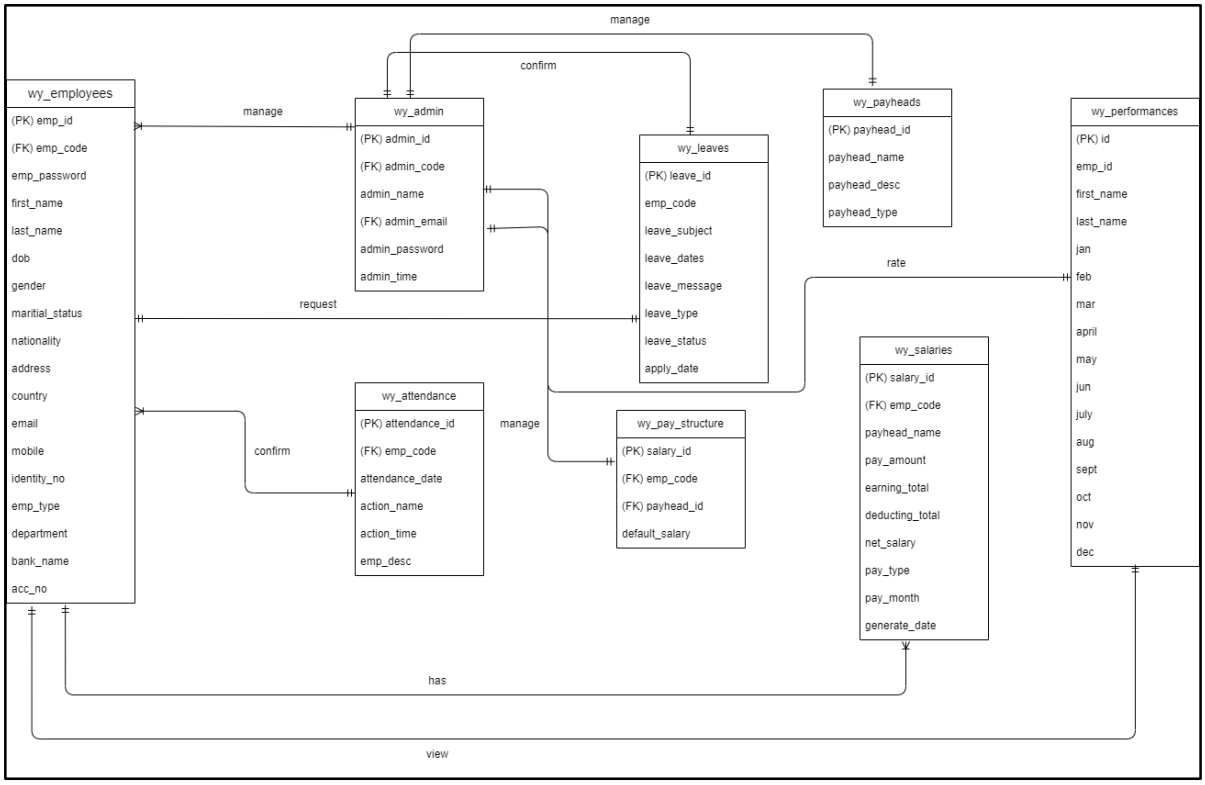

Figure 3: Entity Relationship Diagram

3.2.3 System architecture

Next, the process in the design phase is design the system architecture, database schema, data dictionaries, and system's user interface.

The relational schema for database tables is listed as follows:

i. `wy_admin (admin_id, admin_code, admin_name, admin_email, admin_password, admin_time)`
ii. `wy_employees (emp_id, emp_code, emp_password, first_name, last_name, dob, gender, maritial_status, nationality, address, country, email, mobile, identity_no, emp_type, department, bank_name, acc_no)`
iii. `wy_attendance (attendance_id, emp_code, attendance_date, action_name, action_time, emp_desc)`
iv. `wy_leaves (leave_id, emp_code, leave_subject, leave_dates, leave_message, leave_type, leave_status, apply_date)`
v. `wy_pay_structure (salary_id, emp_code, payhead_id, default_salary)`
vi. `wy_payheads (payhead_id, payhead_name, payhead_desc, payhead_type)`
vii. `wy_salaries (salary_id, emp_code, payhead_name, pay_amount, earning_total, net_salary, pay_type, pay_month, generate_date)`
viii. `wy_performance (id, emp_id, first_name, last_name, month)`

User interface is the main connection between the user and the computer. Therefore, the interface must be well designed in order to guide the user on using the system. A well-designed interface should be easier to be understand by the user. Thus, the design of the interface should be manageable and easier to interact. Figure 4 until Figure 9 illustrates the interface of the proposed system.

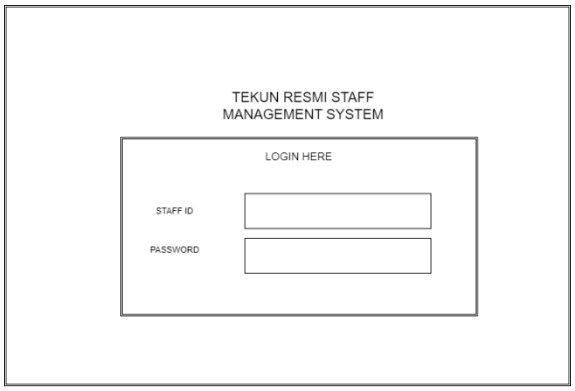

Figure 4: Interface of login

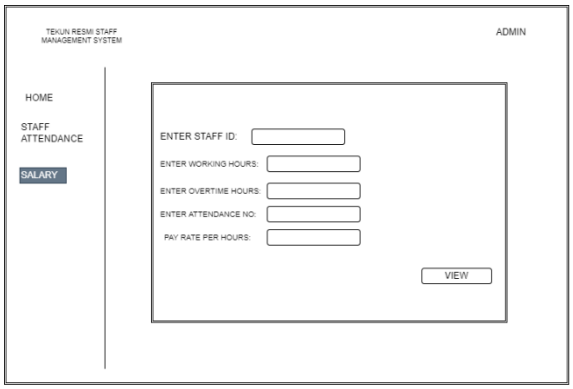

Figure 5: Interface of salary (Administrator)

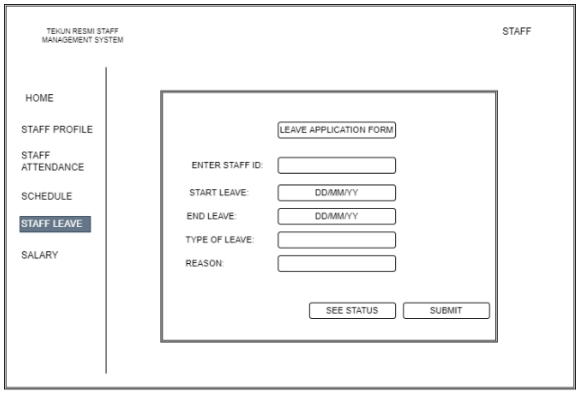

Figure 7: Interface of leave form (Staff)

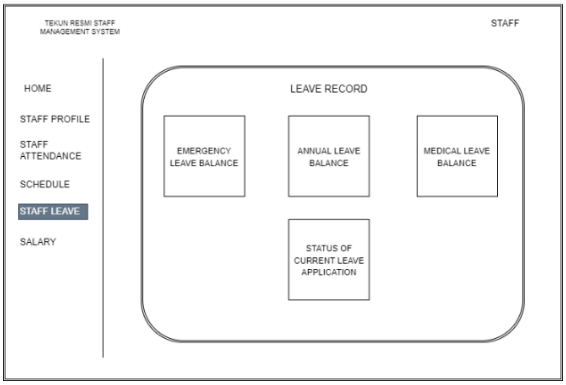

Figure 8: Interface of leave record (Staff)

Figure 9: Interface of attendance(Staff)

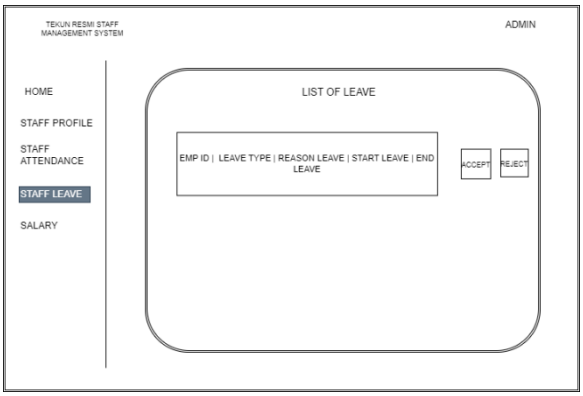

Figure 10: Interface of staff leave (admin)

3.3 Implementation Phase

In this phase, the proposed system will be built using all of the data from the previous phase. Visual Studio Code, which used the PHP programming languange, will be used to construct the proposed system and at the same time, phpMyAdmin performs as the database of the system

3.4 Testing Phase

All codes are developed and implemented during the testing process [6]. Alpha and Beta testing are the two forms of testing phase will be conducted. Alpha testing is type of software testing performed to

identify bugs before releasing the product to real users. While for the Beta testing is performed by real users of the software application in a real environment [7].

3.5 Maintenance Phase

Once the implementation phase is completed, the system will be given time to provide company training assistance. These services may include everything from technical assistance to maintenance to ensure that the system is always up and running and that users are satisfied [8].

4. Results and Discussion

The back-end user side of the Tekun Resmi Management System is built with PHP, while the front-end system is designed with HTML, CSS, and JavaScript. The system is also connected to phpMyAdmin which serves as the system's database for data storage.

4.1 System Implementation

Figure 11 shows the system's login interface, both user, staff and administrator can access this interface to logging into the management system. It is worth noting that this management system cannot be access if the staff do not have registered account because to logging, users need to input staff ID and password.

Figure 11: Login Interface (Staff and Administrator)

As shown in Figure 12, the administrator can register new account for new staff, which includes, the full name, date of birth, gender, marital status, nationality, address, city, state, country, email id and contact number. Administrator must input all the details to create an account for the new staff of Tekun Resmi Sdn Bhd.

Figure 12: Interface of New Registration Tekun Resmi Staff

In the Figure 13, it shows the interface of staff after logging in. Staff information that has been recorded by administrator will be shown on staff account, they can view but can do any update because personal data is very crucial, staff cannot change their personal details, it is to avoid any fraud happen.

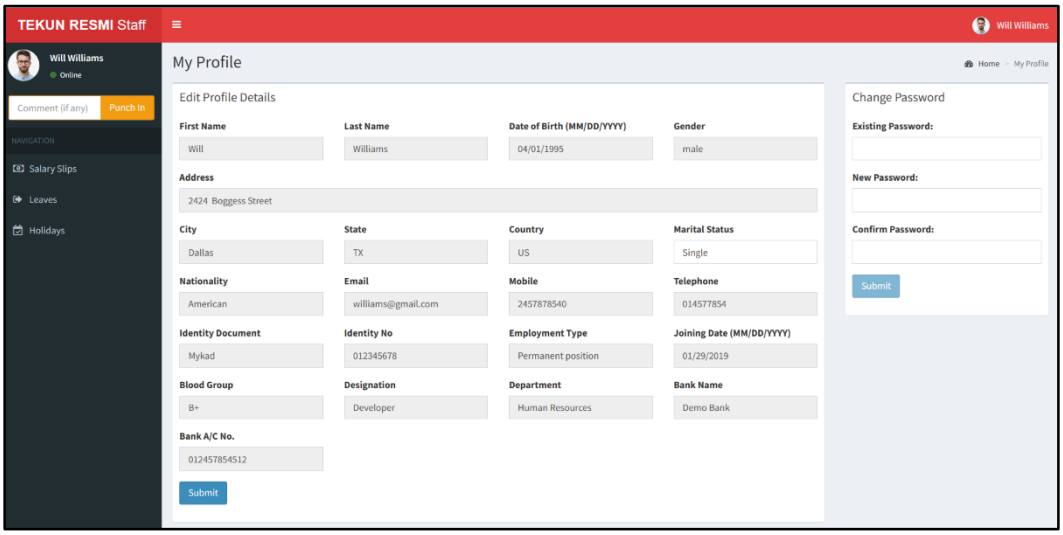

Figure 13: Interface of Staff profile

Figure 14 shows interface of attendance module for administrator, including staff's attendance information such as, date, staff id/code, staff name, punch-in, punch-in message, punch-out, punch-out message and work hours. Staff need to fill in the attendance every time they come to work. Attendance is crucial because staff salary is based on attendance performance. Staff must put a code and click on "punch in" at side menu as seen in Figure 15.

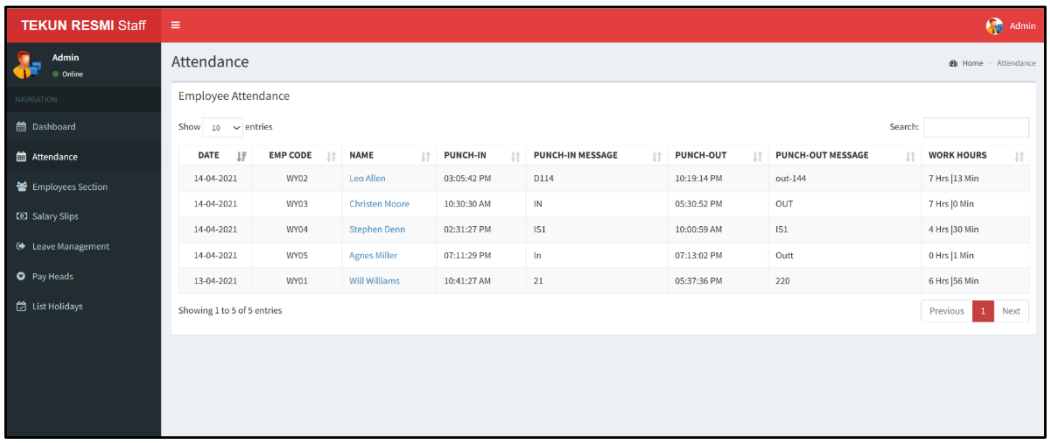

Figure 14: Interface of attendance module for administrator

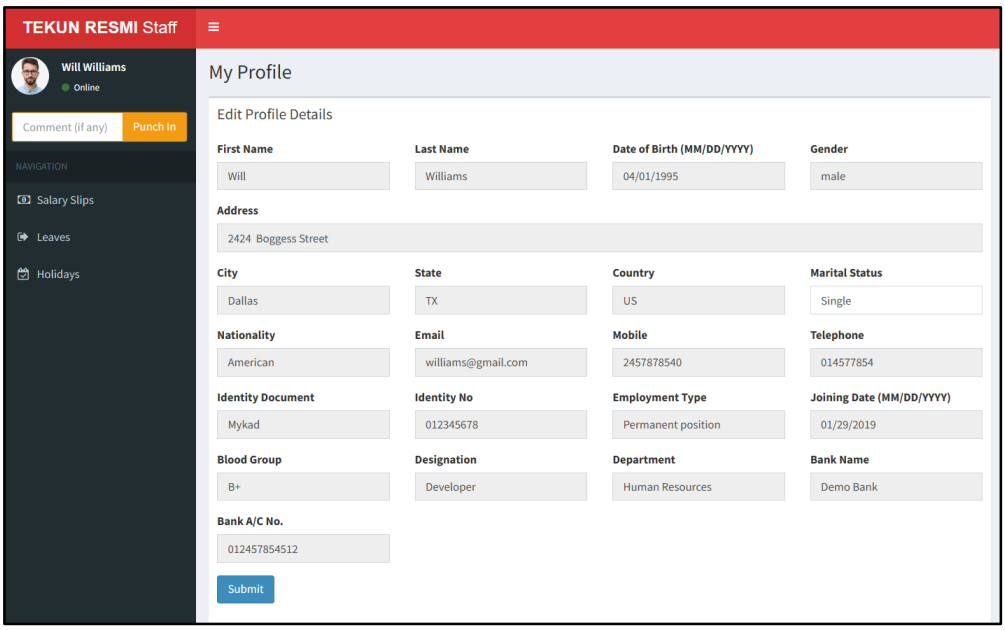

Figure 15: Interface of attendance module for staff

In Figure 16, the leave module is for administrator to manage whether is want to approve or reject the leave application from staff. While as shown in Figure 17, staff are allowed to apply leave through the module by fill in the leave subject, leaves date and choices the type of type is taken. After that, staff's leaves application shown in the same interface and staff can see the status of their leave application.

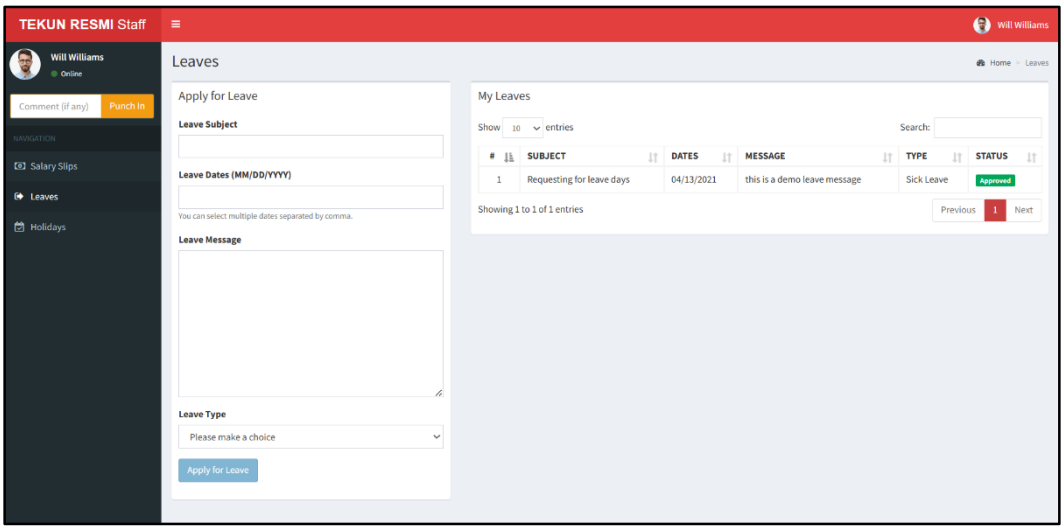

Figure 16: Interface of leave module for administrator

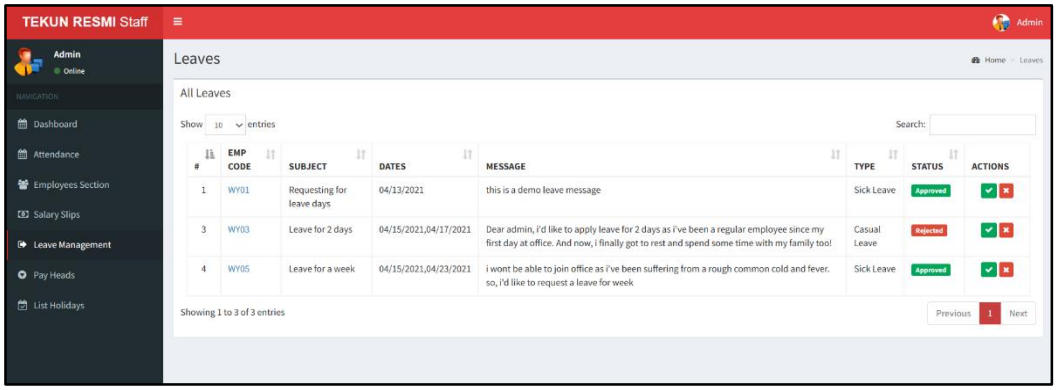

Figure 17: Interface of leave module for staff

Figure 18 indicated the payroll module that only administrator have access to it. The module contains every staff's payroll details and the administrator also can print out the payroll.

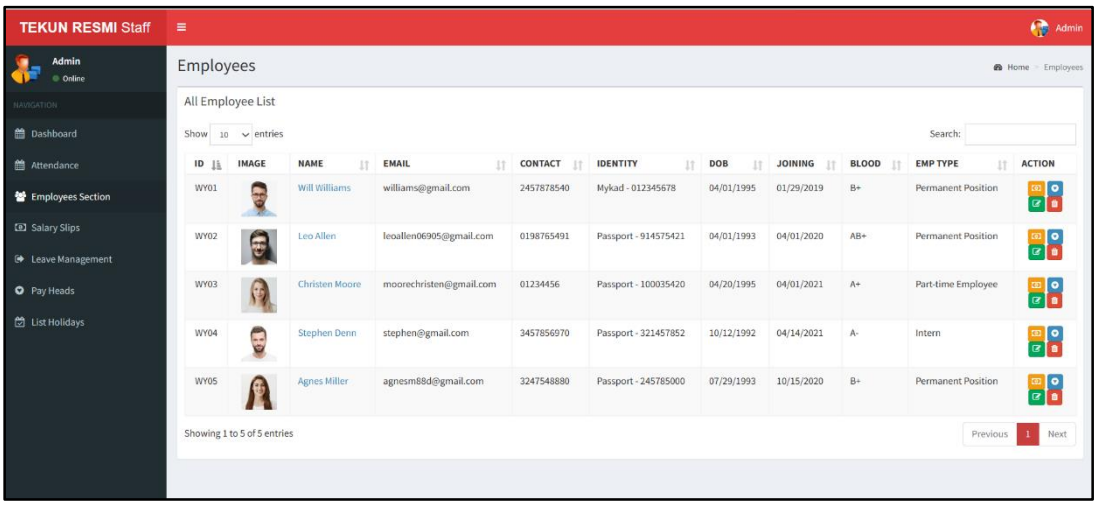

Figure 18: Interface of salary module for administrator

The administrator interface in Figure 19 shown staff information and by using the tools buttons provided, administrator can perform CRUD operations for creating, reading, updating, and deleting an employee information.

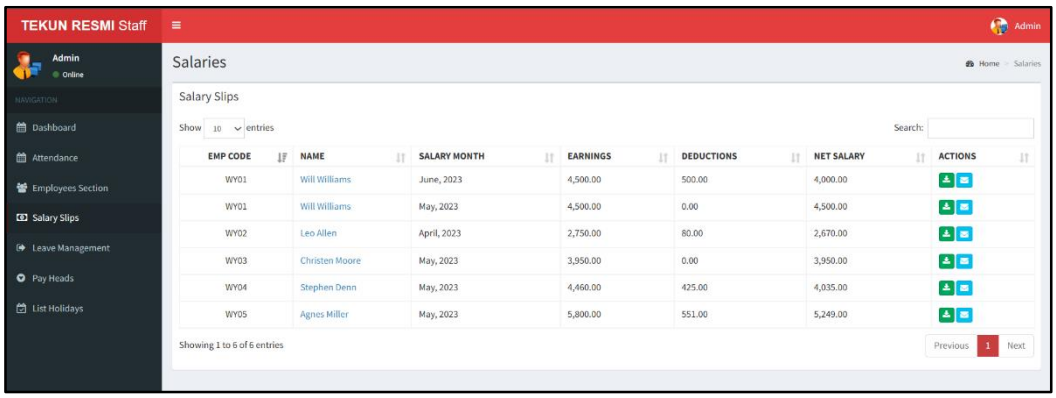

Figure 19: Interface of staff information module for administrator.

4.2 System Testing

After the system is completely developed and implemented, the testing phase then will be conducted using the test plan and the user acceptance test, to ensure that the system had fulfilled all the functional and non-functional requirements.

4.2.1 Test Case

The system testing is performed to ensure that the developed system is fully functional, operates smoothly and meets the requirements during the system development. Table 6 until Table 11 shows the results of functional test case, whereas Table 12 illustrates the results of non-functional test case for Tekun Resmi management system.

Table 6: Test case for login module

No.	Functions	Expected Result	Actual Result	Pass/Fail
1.	To check whether admin can login into the system.	The admin should be able to login into the system.	The admin has successfully logged into the system.	Pass
2.	To check whether staff can login into the system	The staff should be able to login into the system	The staff has successfully logged into the system.	Pass
3.	To check whether the system will forbid login if incorrect credentials is entered.	The system should be able to restrict login when incorrect credentials is entered.	The system restricted the login when there is incorrect or no credentials entered.	Pass

Table 7: Test case for register module

No.	Functions	Expected Result	Actual Result	Pass/Fail
1.	To check whether admin can view the personal details of staff.	The admin should be able to display staff personal details.	The admin can view staffs' personal details.	Pass
2.	To check whether staff can view their own personal details.	The staff should be able to view their own personal details.	The staff can successfully view their own personal details.	Pass
3.	To check whether admin can update the personal details of staff.	Admin should be able to update the personal details of staff.	Admin can edit and update staffs' personal details.	Pass

Table 8: Test case for leave module

No.	Functions	Expected Result	Actual Result	Pass/Fail
1.	To check whether staff can apply for leave.	Staff should be able to apply leave by using the system	The staff can apply leave in the system.	Pass
2.	To check whether staff can view their personal applications details.	The staff should be able to view their own leave applications details.	The staff can successfully view their own leave details.	Pass
3.	To check whether admin can perform CRUD operations for leave types.	Admin should be able to perform CRUD operation for leave types.	Admin can edit and update leave type details.	Pass
4.	To check whether admin can approve or reject staffs' leave application.	Admin should be able to approve and reject staffs' leave application.	Admin able to update staffs' leave application.	Pass
5.	To check whether admin can view staffs' leave application history.	Admin should be able to view staff's leave application history.	Admin can view staffs' leave application history.	Pass

Table 9: Test case for attendance module

No.	Functions	Expected Result	Actual Result	Pass/Fail
1.	To check whether staff can clock in and out.	Staff should be able to clock in and out by using the system	The staff can clock in and out.	Pass
2.	To check whether admin can view staff attendance details.	The admin should be able to view staff attendance details.	The admin can successfully view staff attendance details.	Pass
3.	To check whether the module can calculate working hours.	The admin should be able to view working hours of staff attendance	The admin can view working hours of staff attendance.	Pass

Table 10: Test case for salary module

No.	Functions	Expected Result	Actual Result	Pass/Fail
1.	To check whether admin perform CRUD operations.	Admin should be able to perform CRUD operations for salary advance.	The admin can perform CRUD operations for salary advance.	Pass
2.	To check whether admin can perform CRUD operations for deduction.	The admin should be able to perform CRUD operations for deduction.	The admin can successfully perform CRUD operations for deduction.	Pass
3.	To check whether staff can view payroll details.	The staff should be able to view payroll details.	The staff can view payroll details.	Pass

Table 11: Test case for report module

No.	Functions	Expected Result	Actual Result	Pass/Fail
1.	To check whether admin can rate employee's monthly performance.	Admin should be able to rate employees' monthly performance.	The admin can rate employees' monthly performance.	Pass
2.	To check whether staff can view personal monthly performance.	The staff should be able to view personal monthly performance.	The staff can successfully view personal monthly performance.	Pass

Table 12: Non-functional test plan

No	Test Cases	Actual Result
1	Ensure the login error message does not directly indicate which part of the authentication data is incorrect. For example, "incorrect password" should not be shown as an error message.	Pass
2	Ensure the system support number of users at the same time.	Pass
3	Passwords should be obscured in the textbox	Pass
4	Enforce system access to internet easily.	Pass

5. Conclusion

Even though the system's initial objectives and intended functionality were successfully implemented and developed, it still has some limitations. One of the system's limitations is staff cannot view their attendance Furthermore, because the project scope is restricted to company Tekun Resmi Sdn Bhd, the system may not cover the entire spectrum of employee or human resource management such as lack of training and recruiting functionality. Moreover, the salary module is only for administrator to calculate staff salary more conveniently but it does not support any payment function due to the restricted project scope.

Therefore, the enhancements that can be made for the system in the future first is implement the notification functionality for the leave module to improve the overall performance of employee management. Besides, the scope of the project may also perhaps be broadened in the future. As a result, the proposed system could potentially cover a wider range of employee management such as implement the training and recruiting functionality. Once the project scope is expanded, it is also possible to further enhance the system's salary module to make it more advance which allows payment of wages can be completed through bank credentials to follow the goal of a cashless society.

Acknowledgment

The authors would like to thank the Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia for its support.

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