

Web based Staff Management System – Development for the Establishment Branch of University

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Abstract. In this world of growing technologies everything has been computerized. With large number of work opportunities the human workforce has increased. Hence, it's necessary to maintain the staff records in well-organized way. Many organizations specially the government institutes are still using the traditional methods which are purely paper-based to store the data of their employees. This waste the time to generate reports or search for employees' records and loss or damage of files. Thus, there is a need of a system which can handle the data of such a large number of staff in an organization. This paper discusses the development of a computerized staff management system to the Establishment branch of Vavuniya campus, University of Jaffna. The need of staff management system was analysed through the survey and discussion with respective personnel and it was 84.9% positive response for the development of the system. The web based staff management system was developed using ASP.NET while the database designed using MYSQL to maintain the staff details, calculate the monthly salary of the staffs, forward the salary increment particulars to the financial branch, maintain reports of the work and salary of the staffs etc. This can pave way for the efficient management of the staffs of each particular department & improvement of the organizational performance.

Keywords: Staff management system, Web development, Human resource, Human resource management, ASP.NET

1 Introduction

All public and private offices, including businesses and government, generate personnel records. Personnel records play a vital role in providing the information needed by organizations to manage and pay their staff members, plan their workforce requirements and monitor staff performance. Ultimately, any organization's development and sustainability will depend on sound and effective human resource management, and the approaches it chooses to follow will be derived in part from an analysis of the information contained in personnel records. The goal of personnel records management is to ensure that a complete and comprehensive employment history of each employee is readily available for as long as it is needed, and that the information contained in personnel records supports the management, deployment, payment and development of staff.

Other key objectives of personnel records management are to support transparency and organizational accountability and to enable accurate audits by creating and protecting human resource records as reliable evidence [1].

Most of the organizations now shift from manual document management to electronic document management, which is found to be more reliable and efficient. Since early 1990, the utilization of electronic documents on daily routine activities is practiced by all levels of management [2]. Continuous innovations in technology is paving the way HR work is accomplished [3]. Information systems have a deep effect on HRM. It transformed human resources processes and practices mainly in terms of how organizations collect, store, use, and disseminate information [4]. Hence, it's efficient and need to shift from traditional paper based staff /human resource management to computer based system.

In the research carried out by Dr. Shikha N. Khera, Ms. Karishma Gulati on Human Resource Information System (HRIS) and its impact on Human Resource Planning, says that it helps the organizations in planning their human resources both quantitatively and qualitatively. Being an information system of human resources, it can store voluminous data about the employees, that not only helps in identifying the occupied and unoccupied positions but also whether the person at particular position is fit for the job or not. Other advantages of HRIS include healthier HR decisions and enhanced supervision and control of manpower. HRIS also helps in reducing various costs like labor cost, recruitment cost etc. as it is computerized system. By adding the employee's information in HRIS and analyzing that information using the same helps in reducing various costs. Erstwhile these advantages, HRIS exert outstanding strategic activities by HR managers. These activities includes training and development management, succession planning (identification of key positions and their requirements), applicant tracking in recruitment and selection and manpower planning, personnel information and identification (attendance tracking, etc.), salary planning, absenteeism analysis, turnover analysis and work scheduling [5].

Human Resource Management Systems can give a huge lift to the company's operations. If whatever has done manually has been completely shifted to the computerized process and this will enable the company to carry out its operation more quickly. This also will give wider spectrum of communication to the users. It also results to more efficient processing of data. The system results numeric advantages to the company in many ways. Some of them are state of negligible paper work is almost reduced, accessing and getting data can be done at a single click, data manipulation can become simpler and the cost factor will be reduced, faster and more efficient processing of data and communications between the users will be more efficient [6].

As per the review of previous studies regarding the Human Resource Information System, found that the study of human resource information system is fruitful step for advancement of human resource information system and its practices [7].

1.1 Background of the selected Institute

Vavuniya Campus of University of Jaffna is one of the state universities of Sri Lanka which consists of three main faculties; Faculty of Applied Science, Faculty of Business Studies & Faculty of Technological Studies. It has several units working together for the long run of the campus. One of them is the Establishment Branch. The Establishments Branch supports for the human resource needs of the campus and to work them to maintain organizational vitality through effective and efficient administration of the functions which include, but are not limited to the followings [8]:

1. Maintaining the staff personal details.
2. Calculating the salary details of the staffs.
3. Managing the leave particulars of the staffs.
4. Forwarding the salary increment particulars of the staffs to the financial branch.
5. Maintaining reports of the work and salary of the staffs.
6. Managing the job confirmation (date of joining and date of leaving) details.

1.2 Motivation

Currently Establishment Branch is maintaining a file-based system in order to carry out these functionalities. The Establishment branch is the responsible unit in-order to maintain the records of all the staff (academic, non-academic & supportive staff) of the Vavuniya campus. Hence overall management of these staff details with the traditional paper-based system is tedious and following issues also identified;

1. It takes more time to maintain all the records of the staffs manually.
2. Lots of mistakes may occur while calculating the salary manually.
3. Hard to remember the dates of the salary increment.
4. Difficult to update the staff details periodically.
5. Difficult to analyse & prepare the salary/work report.

The above identified problems are hard and inefficient to be handled manually. Using a web-based system to handle these tasks would greatly reduce the work load of the Establishment branch of the Campus. Paper work can be kept at a minimum level and valuable workforce of the branch can be assigned to other important tasks while the online system takes care of the staff management and data processing.

1.3 Objectives

The main purpose of this study is to develop a web-based staff management system to the Establishment branch of the Vavuniya campus in-order to reduce the manual operation required to maintain all the records of the staffs and to reduce the time & complexity of tasks perform by the Establishment branch. To achieve this goal following objectives were identified:

1. To gather the requirements to develop the system
2. To model the system architecture
3. To construct the database & the backend of the system.
4. To design the interface of the system.

2 Materials and Methods

2.1 Requirements Analysis

To determine the need of the computerized staff management system for the Establishment branch, survey was conducted for the staffs of Vavuniya campus including academic, non-academic & other supportive staffs. 212 Structured questionnaires were distributed to the

staffs of Vavuniya campus. According to the results obtained from the survey it was found that 84.9% positively responded to computerize the staff management while 15.1% preferred for the traditional paper based management.

Once the need of staff management system was ensured, the requirements for the development of the system was analyzed & listed based on the functionalities of the Establishment branch & the discussion with Deputy Registrar. Followings were the identified main requirements, which should be satisfied by the system.

- Security login to system (authentication of a user)
- Create new users who belong to specific group (Admin, staff Users)
- Maintain staff record
 - Adding new staff
 - Adding reliable data to user
 - Ability to add different rights to users (admin)
 - Ability to modify data and further on to change rights
 - Ability to delete users
- Calculate the salary details of the staffs.
- Manage the leave particulars of the staffs.
- Ability to apply & manage the train warrant
- Alert system to receive important updates/information
- Download the reports.

It was agreed that the staff management system would be developed as a web-based system to match the requirements of the program that would integrate seamlessly with the security infrastructure of the existing portal website of the campus. This will enable authorized users to log in to the system and access the relevant information.

Further end user requirements also identified as its essential for the development of successful web application such as user involvement, prototyping, change management, immediate response, risk minimization, no administrative overhead and transparency and guidance.

2.2 Modelling

Modelling is like building a representation of things in the “real world” and allowing ideas to be investigated. In fact, model is more likely a way of expressing the system in a graphical view.

Unified Modelling Language (UML) was used for the modelling of the proposed staff management system. It is a standard language for specifying, visualizing, constructing, and documenting the artefacts of systems, as well as for business modelling and other non-software systems. The UML represents a collection of best practices that have proven successful in the modelling of large and complex systems. It is an important part of developing system and their development process [9].

Use case diagram

Use case diagram in the Unified Modelling Language (UML) was designed to show the functionalities & the users of the system. Use case diagram is a type of behavioural diagram defined by and created from a use case analysis. Use Cases are text stories, widely used to

discover and record requirements. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals, and any dependencies between those use cases. The main purpose of a use case diagram is to show which system functions are performed by which actor [10].

In the Fig 1 represents the functionalities of the staff management system, where user and administrator have different functionalities to run. Admin has the control of the system to add, modify & delete data/record into the system while users only able to view and request for data.

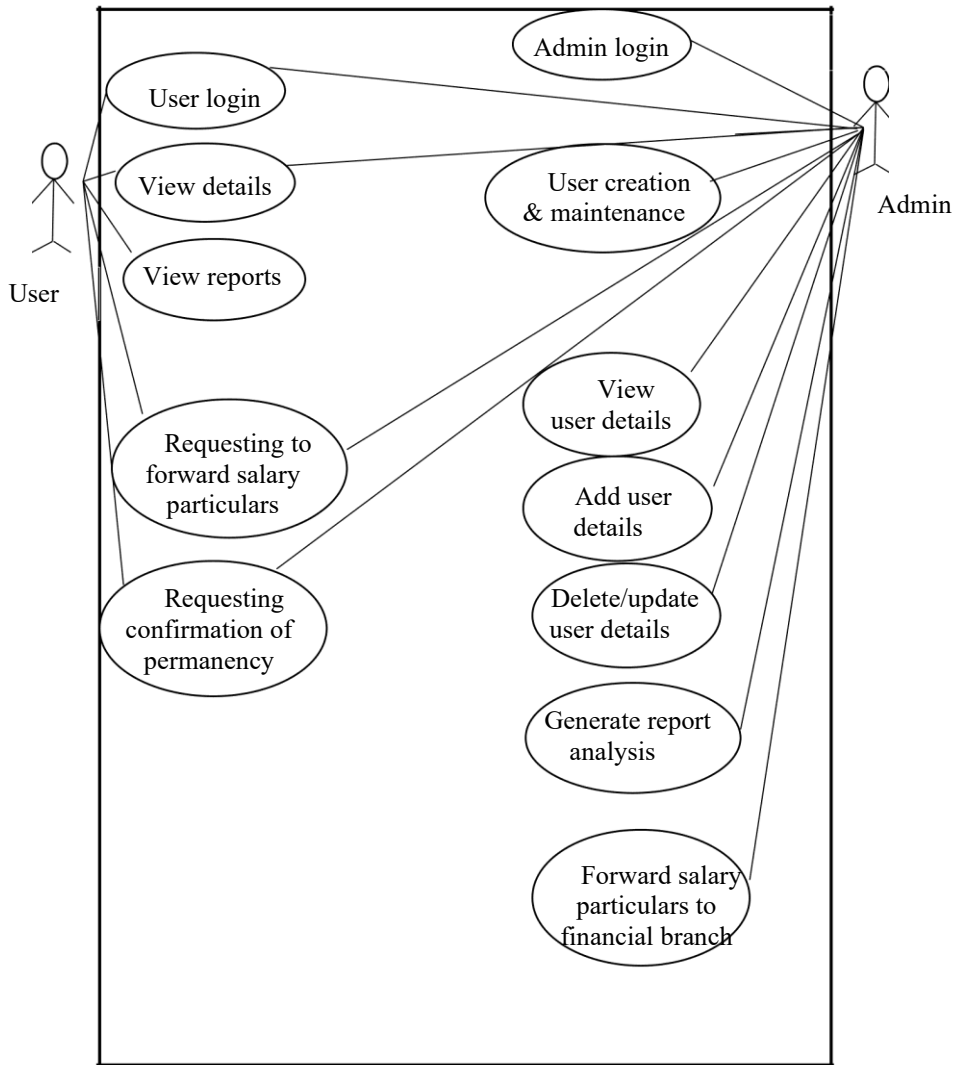


Fig.1. Use case diagram

System Architecture

System architecture is the conceptual design that defines the structure and the behaviour of a system. It defines the system components or building blocks and provides a plan from which products can be procured, and systems developed, that will work together to implement the

overall system. Also it defines the architecture as the set of relationships between the components of a system, that jointly ensures emergent properties of the system as a whole[11].

Fig 2 shows the architecture of the overall staff management system. As the system is web-based, there is a possibility to add new staff details, edit staff details, and delete staff details by the admin. Staff users can view their details; can get alert about their salary increment dates and details, messages from admin etc. From the system the particular user can get his/her details in PDF file format and also can take print. Additionally, the system has a functionality to add new users, ability to delete or lock / unlock users, who later on don't have access to the system any more.

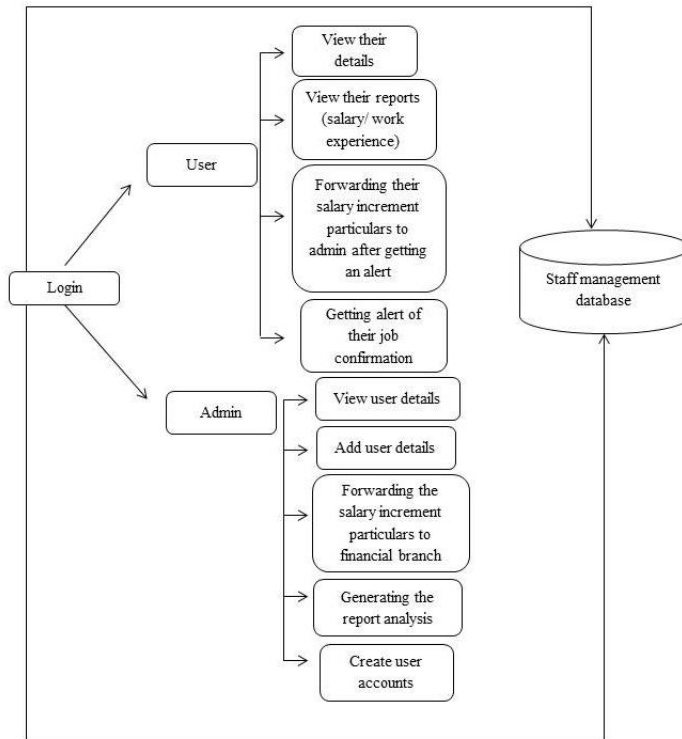


Fig.2. System Architecture

2.3 Implementation

Following development tools & technologies were used to implement the proposed system.

- Language – ASP.net
ASP.net is a development framework for building web pages and web sites with HTML, CSS, JavaScript and PHP.
- Database - Microsoft SQL Server
SQL Server provides more efficiency to manage data of this system.
- Platform – Visual Studio 2013
Professional, great editing, code analysis and debugging support platform to code.

3 Results

3.1 Database design

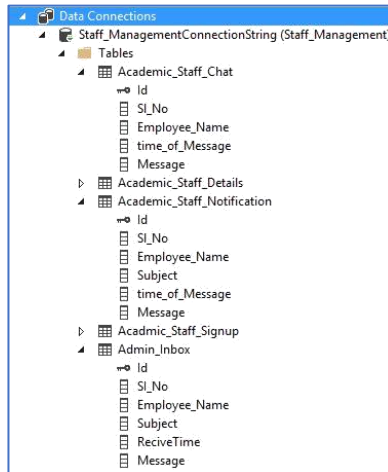


Fig.3. Database design

Data to be stored for the system & how the data elements interrelate were determined & designed using MYSQL. Fig 3 shows the organization of the date of the database model.

3.2 Interfaces

Interface of the web-based staff management system was designed user interactively and user friendly. Followings are main interfaces system.

Home page

Fig 4 shows the first page of the website, through which any user can enter to the system.

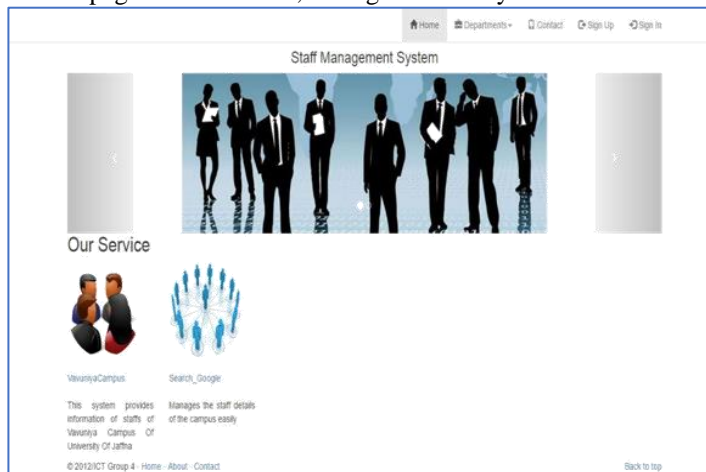


Fig.4. Home page

Login page

Fig 5 shows the login page to enter in to the system. There are two types of users able to login to the system with valid user name and password. They are the admin user and general staff user.

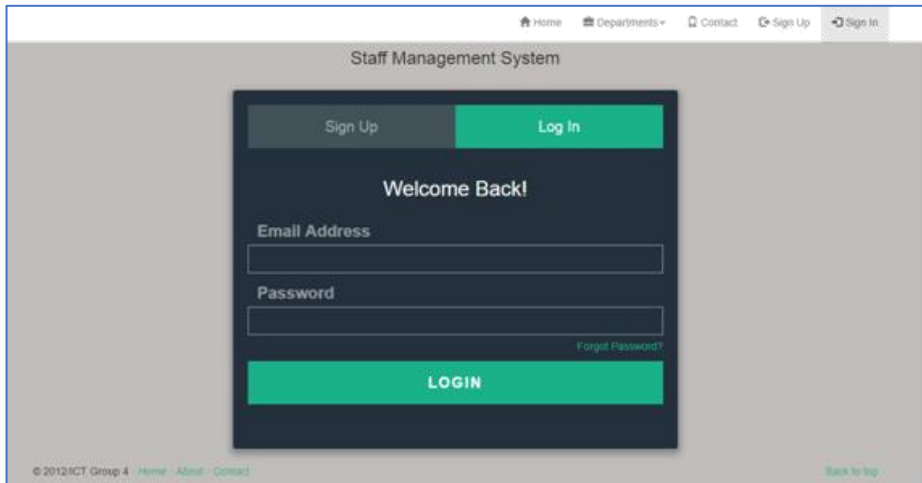


Fig.5. Login page

Admin view

Fig 6 shows the admin view after logging into the system. Here, admin can able to view both the academic and non-academic staff details by select or by search using Id.



Fig.6. Admin view

Add staff page

Fig 7 shows the page to add new staff details to the system which will be stored in the SQL server database. Only admin user can able to add, delete and delete staff details.

The screenshot shows a web application interface for adding staff details. On the left is a dark sidebar with navigation options: Dashboard, Add New Employee, Inbox, Send Message, ChatBox, Academic Staff Alert, and Warrant Information. The main content area is titled 'Add staff details' and contains the following form fields:

- Employee Name: Text input field.
- Employee Code: Text input field.
- Gender: Radio buttons for Male (selected) and Female.
- Employee Address: Text input field.
- Employee Category: Dropdown menu with 'ELTU' selected.
- Date of Birth: Text input field.
- Date of joining: Text input field.
- Date of leaving: Text input field.
- Employee Designation: Dropdown menu with 'Senior Lecturer Grade 2' selected.
- Department: Dropdown menu with 'English Language Teaching Unit' selected.
- Employee Type: Text input field.

Fig.7. Add staff details

Chat box of admin

Fig 8 shows the chat box page, where admin can chat with active online users who are logged into the system. Further admin can send and receive normal messages from staff users.

The screenshot displays the 'Chat box of admin' page. The page title is 'Vavuniya Campus Statistics Overview'. The chat interface shows a list of messages:

- Message 1: From Admin, text: "Hello Admin".
- Message 2: From Mrs Nilani Stonig, text: "Hey".
- Message 3: From Admin, text: "Hi".
- Message 4: From Dr Gnanaseelan Jeyaseelan, text: "Hi".

At the bottom of the chat area, there is a text input field labeled 'Enter Message' and a 'SEND' button.

Fig.8. Chat box of admin

Dashboard of staff user

Fig 9 shows the dashboard of staff user. This is the view of staff user once logged into the system. Where staff can view his/her details, read messages from admin, can download the details in PDF format. Staff User's privilege is limited to edit/delete the details.

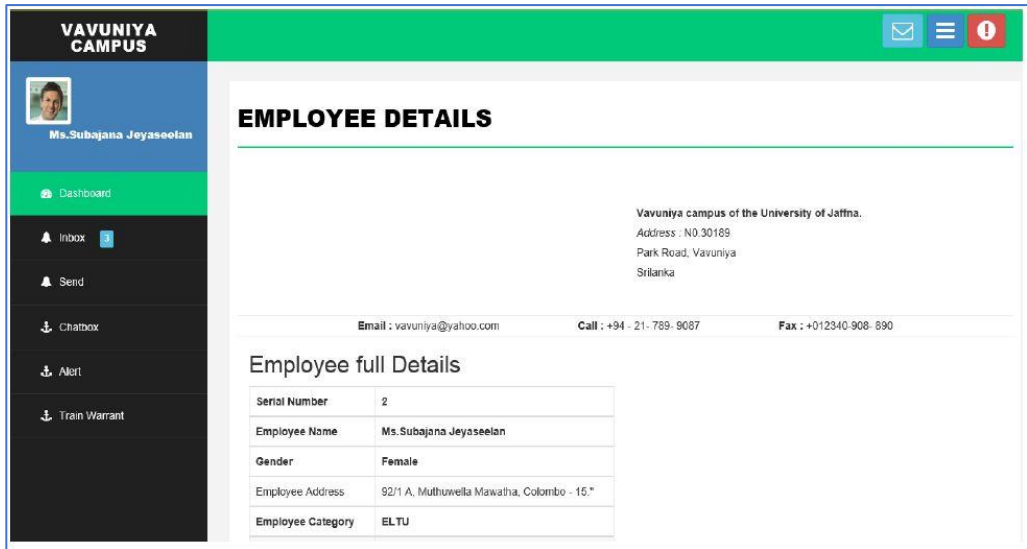


Fig.9. Dashboard of staff user

Alert page of staff user

Fig 10 shows the alert page, where the staff user can get the alerts such as salary deposits and railway warrants approval.

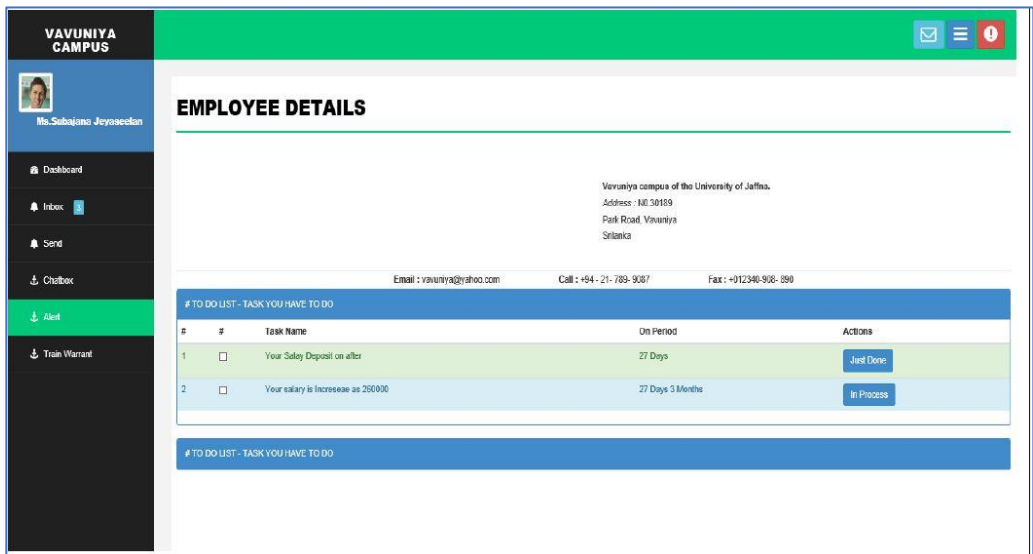


Fig.10. Alert page of staff user

Train warrant application form

Fig 11 shows the warrant form to apply for a train warrant. It will be verify & approve by the admin user.

The screenshot shows a web application interface for Vavuniya Campus. The header is green with the text 'VAVUNIYA CAMPUS' and navigation icons. A sidebar on the left contains a user profile for 'Ma.Sudhishama Jayaseelan' and a menu with options: Dashboard, Inbox, Send, Chatbox, Alert, and Train Warrant (highlighted in green). The main content area is titled 'TRAIN WARRANT DETAILS' and contains the following form fields:

- Date of out ward journey:
- Departure From Station:
- Date of Return:
- Arrival To Station:
- Type of Reservation: - no of Seat Reervation:

At the bottom of the form are two buttons: 'submit' and 'Reset'.

Fig.11. Train warrant application form

4 Conclusion and Recommendation

A Completion of the fully working web-based staff management system for the Vavuniya Campus of the University of Jaffna was aimed. Requirements from the Deputy Registrar has been gathered and taken in to our system. It was developed to improve the performance, productivity and efficiency of the Establishment branch of the Vavuniya campus. System was designed to update, Delete, View and Insert staff details. It facilitates staff to apply for leave & train warrant without physically visit to the office and also provide alert regarding their conformation of job, salary increment, & monthly salary report. Further it can be accomplished that staff management system is an excellent tool for human resources management as it facilitates in calculating & generating salary reports, and digitize the records & data.

To conclude, a web-based staff management system is recommended to use in Establishment branch of Vavuniya campus as it ensures the reliability & security of staff information as well as increase the efficiency & performance of the Establishment branch regards of human resource management of the campus.

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