Adaptive Electronic-Leave Management System

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ABSTRACT

Leave management refers to the management of staff leave processes, information, records and documents. Manually administered leave programs are complex, costly to manage, and often result in errors. Supervisors are often unable to respond to leave requests in a timely manner due to complex eligibility and entitlement policies. In this paper, an adaptive e-leave management system was designed to ensure the administration of standard leave policies, centralized the collection and maintenance of leave records and automates as much of the leave processes as possible. The system comprises of two level structural concepts of authority namely, first level approval and second level approval. The adaptive nature of it makes it to fit conveniently into any device used in accessing the platform without distortion in display and rendering. The system is implemented using PHP as server-side scripting language and MYSQL as the database, with other functional programming tools and languages such as JQUERY, BOOTSTRAP, JAVASCRIPTS, HTML and AJAX. The performance of the adaptive e-leave management system shows that it is efficient, effective and also promotes a paperless office concept and reduces wastage of time, manpower and money.

Keywords: Adaptive, Electronic Leave, Management, Policies, Supervisor

1. INTRODUCTION

According to [7] leave refers to a period of time when someone has special permission to be away from a job. Leave management refers to the management of staff leave processes, information, records and documents [8]. Leave management is the process of employees requesting time away from work and supervisors granting or denying leave based on its impact to the organization. Leave management system embraced in the early time is being done manually which involves lots of paperworks and manpower and this method is not efficient and effective. Staff's leave records are not properly kept which result in loss of valuable data and information. Manually administered leave programs are complex, costly to manage, and often result in errors [1]. It could result in leave abuses and costs related to absent staff. The system involves lots of paper works and manpower, it is not an efficient and effective system that can keep track of the staff's leave records, it has no backup and if the file with all the information are missing or damaged, all valuable information will be lost, the principal officers may have problem in approving or rejecting leave application as he may find it difficult in getting the staff leave balances. Manually administered leave is inefficient in today organisations; application forms sit on managers' or head of department desk for too long; they get lost in the routing process; and there is no easy way for employees to know their leave balance and other information immediately. Summarising and compiling leave records becomes an insurmountable task for organisations relying on manual leave records. With a manual system, supervisors are often unable to respond to leave requests in a timely manner due to complex eligibility and entitlement policies.

Hence, the need to automate the leave system to an e-leave management system which will allow the leave management to be carried out electronically. The e-leave management system is to ensure the administration of standard leave policies, centralize the collection and maintenance of leave records, and automates as much of the leave processes as possible. It is aimed at providing an easier and efficient e-leave management system that will promote a paperless office concept and reduce wastage of time, manpower and money. E-leave is a web-based leave management system that streamlines communication between human resource and employee and facilitates simple yet efficient management of employee leave. For employees, this system allows them to easily determine their vacation availability (from any point-in-time) and request leave online (electronically). For managers, leave approval no longer involves trails of paperwork.

According tov[4], E-leave management system is a web-based system that enables the employee to submit leave requests. The leave request is forwarded to the employee's supervisor / head of department who approves it or denies it. Approved leave requests are forwarded to the principal administrator who approves or denies it. The E-leave Management System keeps track of all these leave requests and calculate the leave balances of each employee. It provides a comprehensive leave records and information of each employee. It enables the staffs to apply for leave through an online system, allow e-leave approval or disapproval by dean/head of department, permit staffs to view their own leave application records, their leave status, change or cancel leave applied for, and change their login password. The administrator can also administer the system easily by adding, deleting, and updating the data [5]. It delivers powerful and easy-to-use leave management capabilities that reduce the total costs, both direct and indirect, of administering leave management policies [2]. In this work, an adaptative electronic leave management system is developed. The system ease the burdened tasks that are associated with manual, complex leave management policies such as completion and submission of leave application forms, approval/denial froms and other record keeping monitoring tasks. It help to resolve the difficulties of managing leave transactions on paper-based forms and spreadsheets.

2. LITERATURE REVIEW

[5] designed an intranet system E-leave application system. The system can be accessed within a company or an organization. The approach is to create an intranet system about e-leave application system for the COE staffs that will enable both the user and the administrator in increasing the efficiency and effectiveness on leave application. The architecture employeed is the architecture of software (system) development life cycle. The system aims to computerize leave applications, leave approval and leave balance maintenance, and an up-to-date annual leave balance which is automatically maintained by the system. Even though it is a proper e-leave application system that is able to perform several tasks but it is limited within the network scope of the intranet system. All transactions, such as leave application, leave cancellation, leave approval / disapproval, leave administration and others are only involving one level of supervisor-subordinate.

The Leave Management System by [4] automates the process of managing and tracking multiple types of employee leaves. Employees are able to submit the leave form, cancel previously submitted leave requests, check the status of leave requests and view completed leave transactions. The Leave Management System maintains a database to keep a running balance of each employee's account, accrues employee vacation and sick credits and provides individual reports on employees leave accruals. It ensures the administration of standard leave policies, centralize the collection and maintenance of leave records, and automate as much of the process as possible. The leave management system is weak with respect to effective security measures. Some of the employee still have to fill out time cards, that are used to keep track of the employees' working hours. This means the system still face technical challenges from some old employees.

[6], designed an Intranet based application that can be accessed throughout the organization or a specified group/Department. This system can be used to automate the workflow of leave applications and their approvals. The periodic crediting of leave is also automated. The Human Resources Leave Management System by [9] encircles leave application, leave approval, and the process to record all other leave information. It is a smart e-leave management system that allows staff to apply their leave conveniently. It is designed with auto-routing for approval, an e-leave approving capabilities, making every level leave application a total breeze for those applying as well as those approving. Staff can get up-to date information of leave status without contacting human resource department. The software and database development life cycle that are employed as the architecture of the design gives it a general architectural concepts, that lack specificity and peculiarity. [3] proposed a system that keep track of leaves of the employee. It uses database of the employee details to get the information about the employees and uses it to update details of the leaves that employees will take.

3. DESIGN METHODOLOGY

3.1 An architecture of adaptive e-leave management system (ADEMAS).
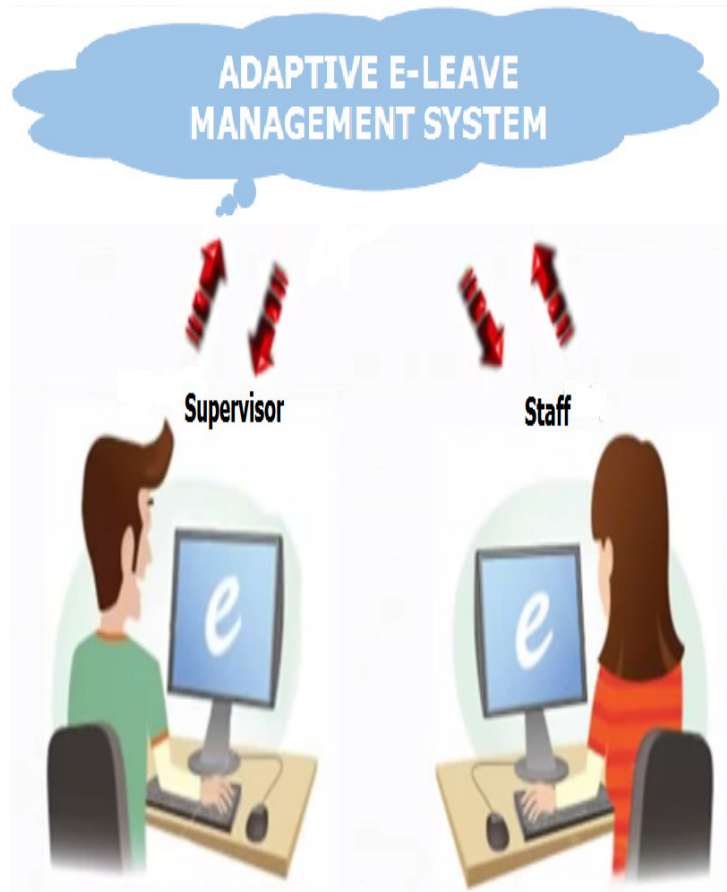Figure 1 shows the architecture of an adaptive e-leave management system (ADEMAS).

Figure 1: Architecture of the Adaptive E-leave Management System

The steps involved in the implementation of ADEMAS are:
i. Login to e-leave
ii. Check leave entitlement
iii. See who is on leave on daily/weekly
iv. Staff apply for leave
v. Supervisor will be notified via e-mail
vi. Staff will then receive the e-mail notification as well
vii. Details will be updated to the e-leave system
viii. Staff can check his/her latest leave balance online, and also remarks from the supervisor
ix. Staff can view the history of his/her leave application
x. Supervisor can also login to e-leave system
   – To approve or reject pending leave
   – View action history
   – Generate report of his/her subordinates
   – Apply on-behalf of subordinates
   – Check his/her own leave entitlement and apply for leave as normal employee.

3.2 Hierarchical Structural Concepts Of Authority
The e-leave management system has 2 level structure concept of authority as shown in figure 2.
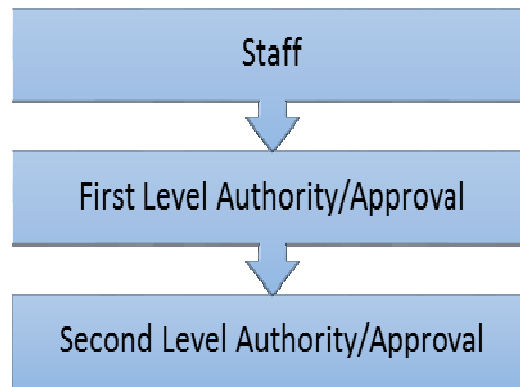

Figure 2: Hierarchical Structural Concepts of Authority

The hierarchical structural concepts of authority defined the levels of leave approval. When a staff apply for leave, his/her leave application passes through first and second level authority and in each of the level of approval/rejection, the staff concern will be notified via email.

3.3 The flow chart of e-leave management system

Figure 3: The Flow Chart of E-leave Management System for Staff.

Figure 4: The Flow Chart of E-leave Management System for Supervisor.

4. IMPLEMENTATION

ADEMAS was implemented using PHP Programming Language and MYSQL Database Engine with APACHE Server Storage. The end user interface is a graphical representation of the design as shown in figure 5 below.

Figure 5: Staff Login Page.

The login interface in figure 5 grant access to users on provision of valid access details. It place restriction on access level of users. The user can be a staff, HOD, Dean or an Admin.

Figure 6 is the Registration page. This is a mini registration interface that allows quick registration. Users can update their profile and provide necessary and important details.

Figure 6: Registration Page

The leave application interface in figure 7 grant users the access to apply for leave. Theleave application form consist of the leave type, leave period, start and end date, and reasons for the leave application. While figure 8 is the E-mail notification page. E-mail notifications are sent to both staff and supervisors about their leave activities. The e-mail provides the supervisor a quick link to login to the system and manage the leave activities

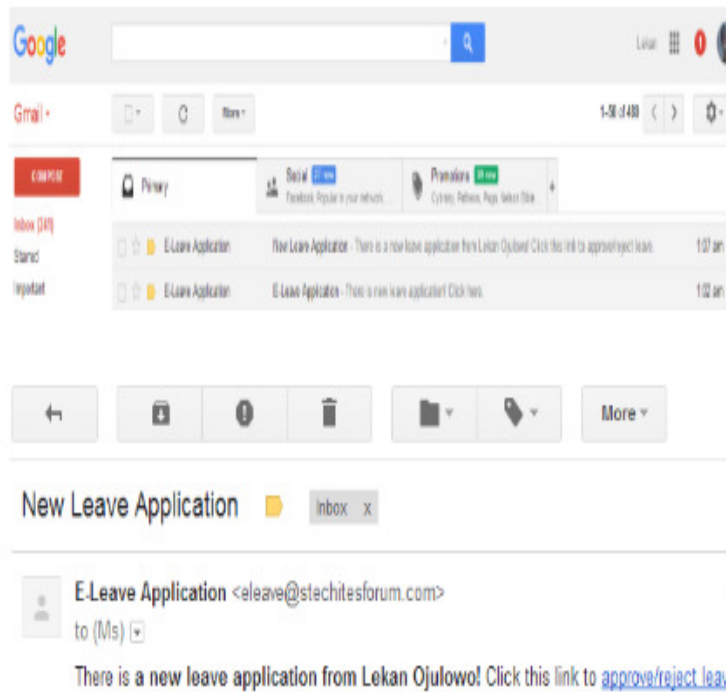**Figure 7: Leave Application**

Figure 8: E-Mail Notifications Page

Figure 9 shows the leave application approval/rejection page. The leave application approval / rejection interface allows supervisors and appropriate approval authority to approve/reject leave applications.
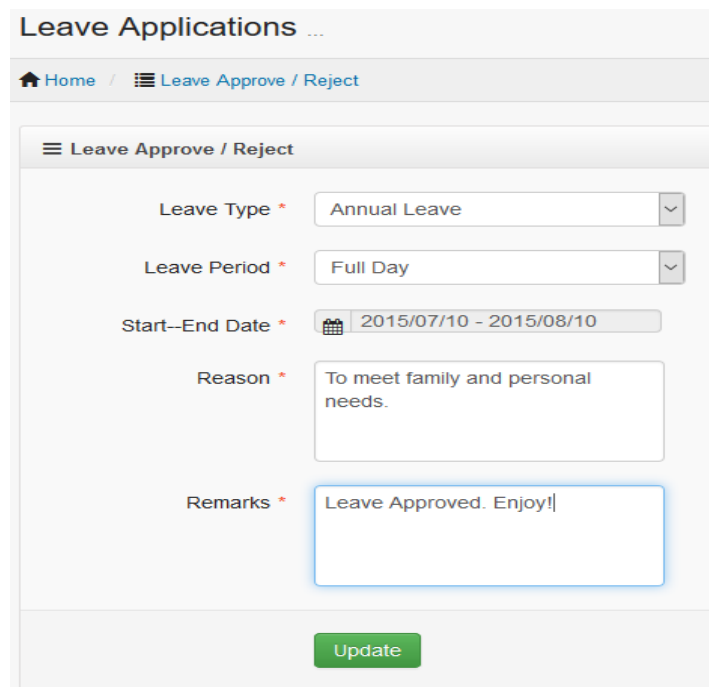

Figure 9: Leave Application Approval / Rejection Page

The administrator setting options in figure 10 allows the admin to manage the e-leave management system easily, efficiently and effectively.
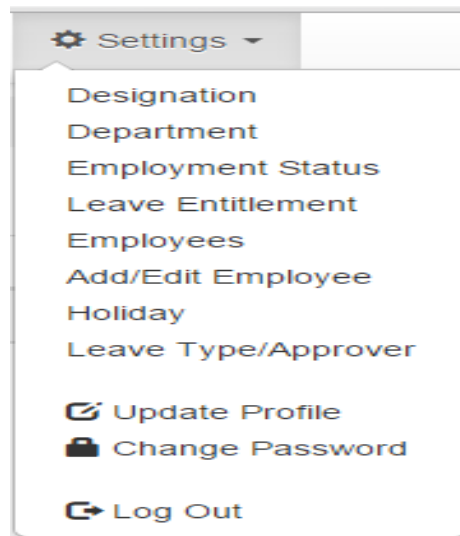

Figure 10: The Administrator Settings Options

Staff employment status interface in figure 11 allows the admin to add, update, view and manage employment status. While figure 12 shows the leave entitlement interface which allows the admin to add, update, view and manage leave entitlement.
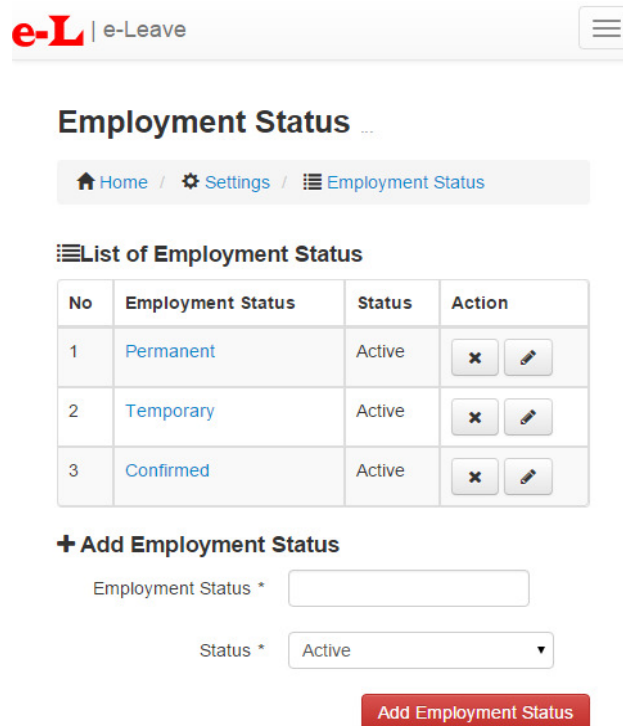

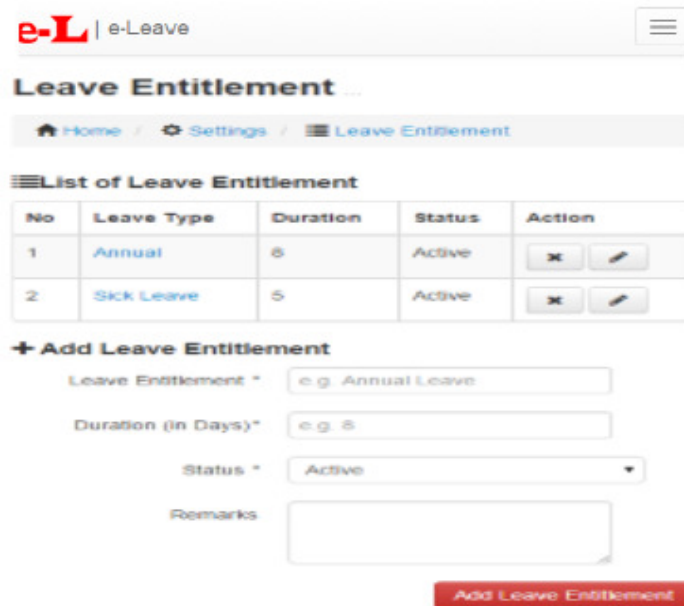**Figure 11: Staff Employment Status**

Figure 12: Leave Entitlement Page

Figure 13 shows al the available leave type and the approver status of each leave.
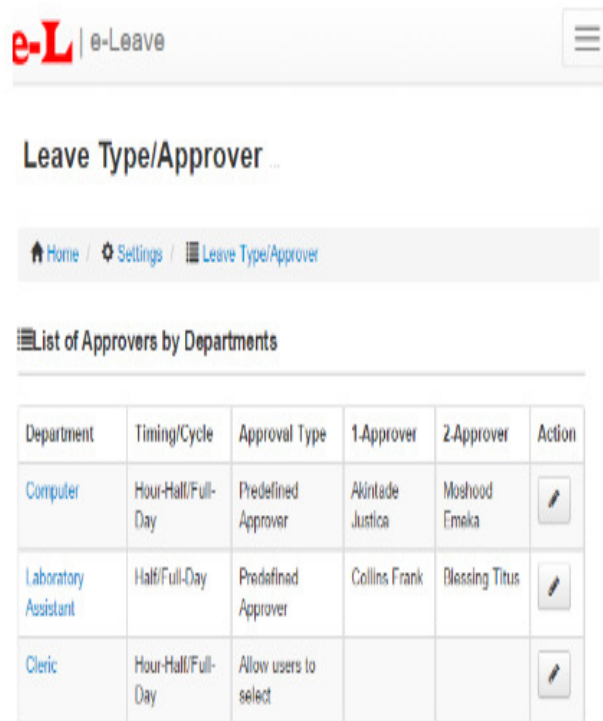

Figure 13: Leave Type/Approver

5. CONCLUSION

Many organizations are faced with the tasks associated with complex leave management policies, including the completion and submission of leave application forms; approval/denial forms and other record.

In this work, an adaptative electronic leave management system was design and implemented. The system allows the employees to check the current status of the submitted leave requests and also displays a transaction list of the leaves taken during the current calendar year. It manages multiple leave policies, assist in calculating accurate leave balances, provide instant information on leave detail/records, assist managers/supervisors/head to study leave trends of their employees, provide instant updates of leave application status to applicant via e-mail or alternatively view from the system, provide users with a simple and user-friendly system interface and reduces leave abuses. The system was able to adapt to various sizes of devices when accessed and still maintain proper display. The leave management facility was provided using mobile application.

In the future, it might be necessary to include SMS notifications to make notification easier and faster. It will also enable quick response, because supervisor get to see notifications without having to login to the platform or to their e-mail account.

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