

ASHESI UNIVERSITY COLLEGE

An Employee Self Service Intranet Portal System

By

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Declaration

I hereby declare that the dissertation is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Name:.....

Candidate's Signature:.....

Date:.....

I hereby declare that the preparation and the presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by Ashesi University

Supervisor's Name:.....

Supervisor's Signature:.....

Date:.....

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Abstract

Human resources management (HRM) is the management of people in an organization. In order for this to be effective, a number of activities must be carried out. Records of these activities have to be kept in order to keep track of progress. Some approaches have been tried over the years to make HRM efficient. These are the paper based system and automation of some HRM. These approaches however have proven to be inadequate. This project focuses on designing and building an employee portal system that would encourage employee interaction and puts as many activities of HRM as possible into the hands of employees. It is also aimed at automating as many HRM activities as possible. By this approach, the human resource manager would be freed up for other important human resource functions, employees would be made to feel a part of the organisation and the organisation would save money, thus making the HRM process both effective and efficient.

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Chapter 1

1.1 Introduction and Objective

The functions of HRM may be classified under manpower planning, recruitment and selection of employees, employee motivation, employee evaluation, industrial relations, provision of employee services and employee education, training and development. Each of these functions presents the human resource manager with challenges that have to be dealt with; most of these challenges border on timeliness and effectiveness. To illustrate, a closer look at manpower planning points out the threat of overstaffing as a challenge. It is wasteful and expensive. If sustained it could reduce the overall competitive efficiency of the organisation or business. When it comes to the provision of employee services, a late execution of employee holiday schemes, which is one activity related to that function, will result in unhappy employees which could lead to a reduction in employee productivity. Similarly scheduling an essential employee training program after it is needed may render the whole activity ineffective and a waste of the organisations resources.

These challenges can be dealt with in a number of ways. One way is by developing an employee web application that provides viewing and printing options to employees. With the above approach employees who want to view some information will access the application and then print what they want. They cannot edit the

information in any way. Another approach is designing a system to automate some of the activities involved in HRM. This means rather than manually perform all tasks of HR, employees will have the easier option of a computerised approach. Also, a self-service intranet for employees can be designed. This approach will provide an interactive platform for employees, management and data while reducing stationery cost and eliminating bureaucracy in some cases. This paper will show why an employee self-service intranet portal is the best of the three approaches and how this approach can be followed through to create a system that improves the human resource process in a the other two do not.

Chapter 2

2.1 Previous Work

Prior to the onset of the use of technology in HRM, there was a lot of paper work that had to be done. There were paper forms for almost every activity. There were forms for benefits, compensation, leave administration, training, transportation, job performance/employee recognition, employment practices, hiring and appointment (University of Washington, 2007). These took long hours to fill, analyse and evaluate. It also meant high stationery costs for the organisation. Storing records generated by these forms was also another challenge of this era.

The 1980s came with a growth in the use of sophisticated specialized information systems. The use of information systems in human resource management is an example of this endeavour. It evolved from the automated employee recordkeeping of the 1960s into complex reporting and decision systems. Indeed, to quote the words of Gerardine DeSanctis it became "a major...sub function within the personnel areas of many large corporations." (DeSanctis, 1986). Through human resource information systems (HRIS), applications that handled human resource functions such as employee selection and placement, payroll, pension and benefits management, intake and training projections, career pathing, equity monitoring, and productivity evaluation could be supported (DeSanctis, 1986). The HRIS approach required that there be a

small group of Information System specialists to manage, support, and maintain these applications.

The use of groupware is another attempt that has been made in applying IT to human resource management. Groupware reflects a change in emphasis from using the computer to merely solve problems to using the computer as a means to facilitate human interaction. (Ellis, Gibbs, & Rein, 1991) Thus, they are computer-based systems that support two or more users engaged in a common task, providing an interface to a shared environment. (Ellis & Gibbs, 1989)

Yet another approach that has been tried is the use of Human Resource intranets. In this particular approach, there have been about four evolutions:

1st generation: These display information for viewing purposes only, usually built by IT people with very little input from the Human Resource department

2nd generation: These are built by IT people with quality input from the Human Resource Department. Thus it displays information on procedures and policies, for printing blank holiday request forms, or copies of the company handbooks for new starters.

3rd generation: These contain active content, which means that the information shown is linked to a 'back-end' database. The employees' role determines the type of information that can be accessed and updated. It is difficult to tailor and may not integrate with other back-office systems.

4th generation (employee portal): These focus on the individual, getting the right information to the correct person so that they can act upon it quickly. These sites integrate many different back-office systems so that people can access and update information from one integrated environment.

For the purpose of this paper, only the forth generation will be focused on for discussion. Bearing in mind that "the terms Employee Portals, Enterprise Intranet Portals, Corporate Portals, Business-to-Employees Portals (B2E) and Business-to-Employees Systems are sometimes used interchangeably as synonyms to refer to the category of portals, which aim at providing employees with in-time relevant information they need to perform their duties and make efficient business decisions." (Benbya Hind, 2004, p. 5) Since the inception of the fourth generation, a lot of research has been conducted to identify portal characteristics, benefits and challenges. One such work gives the definition of a portal as "single-point web browser interfaces used within organizations to promote the gathering, sharing and dissemination of information throughout the enterprise."(Detlor, 2000)

The challenges of implementing an employee portal can be classified under three major contexts: Social, managerial and technical. (Benbya Hind, 2004, p. 15).

- Managerial Context

The use of employee intranet portal is cost effective in the sense that it reduces the need for salaried workers. However, this is in itself a challenge. It is a challenge because certain activities are automated, thus reducing the number of employees needed to get the work done. This may bring about the unpleasant task of laying off some staff. Also, the bulk cost of portals lies with the hardware, software license and development, design, system integration and maintenance costs. Thus the purchase of an employee portal is seen as a strategic investment that requires justification. If the need of this technology cannot be justified then there will be no implementation. Again, some employees are not technology oriented thus management would have to take the initiative to organise training for employees, while offering incentives where necessary to aid in the implementation process.

- Technical context

This deals with challenges that arise when information needs and practices of users are not taken into account. One such challenge is poor design which comes about when a portal is designed for the work to be done rather than the people to use it. Similarly, people will only use this technology if it provides an easy way to locate the information they are looking for. Thus, there is the challenge of creating the right interfaces and delivery to encourage use. Another challenge

is ensuring that the technology enables the connection of people so that they are able to exchange information directly where the need arises.

- Social Context

Every organisation has its unique ways. Some organisations require high levels of confidentiality. Indeed “the level of trust that exists between the organization, its sub-units, and its employees greatly influences the amount of knowledge that flows...between individuals...” (Delong & Fahey, 2000). This means that in organizations where the culture encourages both management and employees to socialize and interact frequently with each other, people would share their knowledge; while in an organization that promotes individualistic behaviours people will be more reluctant to give away their most valuable knowledge because they will feel it too risky, or see it as giving up the upper hand they have over others.

There are some ways of countering these challenges associated with employee portals. One way is to improve employee communications and information sharing by providing access to correct and timely information. Another is to support knowledge management by enabling more effective methods of planning and tracking. Also, processes may be streamlined. And yet another way is to reduce the amount of paper flying about while boosting employee morale and creating cross-organisational teamwork. The

employee portal system would present an ideal environment to integrate the business process aspects with knowledge processes. It would also actively support the worker in using and adding knowledge resources by establishing standards for information collection, processing, and presentation. This way all the three major contexts under which challenges associated with developing an employee intranet portal would have been dealt with.

There are nine dimensions by which B2E portal user satisfaction are identified and modelled. The nine dimensions are defined as; information content, ease of use, convenience of access, timeliness, efficiency, security, confidentiality, communication, and layout. (Sugianto & Tojib, 2007). Here, user satisfaction is defined as “an affective attitude towards a specific computer application by someone who interacts with the application directly” (Doll and Torkzadeh, 1988, p. 261). This definition is appropriate because once a user is able to successfully access an employee portal system; he should be able to effectively use it without the help of computer analysts or programmers, unless he is faced with a technical challenge. Before these nine dimensions were arrived at, 11 scales were carefully examined. These scales were the accepted way of determining user satisfaction. They included the widely accepted scales of Bailey and Pearson (1983) and Doll and Torkzadeh (1988), six others based on user satisfaction with specific applications and three more scales in relation to website quality. After thorough examination of portal packages offered by vendors (Plumtree Software, Viador, Oracle and others), it was

discovered that while the features and content of portals may vary from organisation to organisation, the underlying characteristics were the same. These characteristics define what a b2e portal is.

They are that:

- A portal must be accessible at any time with Internet connection
- It must incorporate a single log-on procedure
- It must provide role-based content to each employee
- It must enable employees to undertake more tasks electronically with the integration of self-service applications
- It must act as a medium of communication between the organization and its employees as well as between employees and their colleagues. (Sugianto & Tojib, 2007, p. 6)

A case study on how Data General developed their employee intranet portal sums up a lot of research done on the subject. Some of the practical information the case study presents are on appropriate contents for an intranet. The article points out that an intranet must meet the needs of a specified audience, in this instance, a company or organization. Sites within an intranet should use simple graphics, keeping in mind that not all browsers can accommodate complex graphics. This becomes especially important if the page is to be accessed by mobile devices. Also, the web code used in developing the portal system should be easy to follow as future modification may be done by some other person without the

developer's help. Finally, it recommends that the tone of the intranet's content should be professional.

2.2 Proposed Approach

The proposed approach for improving the efficiency and effectiveness associated with human resource management is a self-service employee intranet portal with some added non-traditional features. What makes a self service employee intranet portal different from other human resource information systems is that it allows for less traditional HRM functions such as payroll and this system will capitalize on this. As the name denotes, a self service employee intranet portal puts more power in the hands of employees as it is to a large extent self-service. This means classic human resource functions such as managing employee information and booking organizational events are directly put into the hands of employees.

This approach comes with many advantages. The first advantage is reduction in stationary cost. With this approach, employees do not have to print hardcopies of forms to fill and submit; thus encouraging paperless approach to Human resource management (HRM). This results in a subsequent reduction in money spent on paper, ink and stapler pins.

Another advantage this approach comes with is making the employee a part of the process. Employees get to update their employment information and curriculum vitae themselves. Since HRM is all about the employees in an organization, it is important that employees are constantly reminded of this. Putting such a

sensitive task in their hands boosts their morale as they are made to feel trusted and as an essential part of the HRM process.

A third advantage of an employee portal is that it can prove to be a good time saver. This is because, time that is usually spent moving between offices/desks, booking appointments and other bureaucracies associated with HRM is saved and can be allocated to other duties. This time saving comes about with the interactive web interface presented by the employee portal. Tasks can be known, reports uploaded, information updated and requests sent with the figurative click of a button.

Finally, the authentication action performed at login will ensure that user activity can be controlled. Also, user permissions shall be granted based on different levels of access in accordance with company policies so that no violations of company policy occur. These features will ensure that employee information remains confidential.

However, there are certain conditions that are necessary if this approach is to function properly. The first is constant power supply and the second is a reliable network connection. It is crucial that these conditions are met because it will ensure that the employee portal is always available to employees.

Chapter 3

In the development of this employee intranet portal system, the spiral development model was applied. This model was chosen because it encourages iterative software development. The first step was to understand HR requirements for an employee self-service intranet portal. This was done through extensive research and interviews with professionals in Human Resource Management and Accounting. The understanding of the project requirements after the above are as follows:

This project deals with the development of an employee self-service intranet portal for a company. The application to be developed is aimed at being an improvement over current HRM information management systems that exist. The application will reduce the amount work the HRM manager is subjected to in order to make the HRM manager available to perform other important aspects of his duties. Next, the application will also help to cut down the amount of paper work that is required by the HRM department. Finally, this application will boost the morale of employees as it will make them feel more in charge of things as they receive regular updates on where they stand in the company.

Software requirements specifications

The software requirements specifications mentioned here will specify what the application should and should not do. These are divided into four sections namely

1. System Objectives

This section lists the goals and objectives of the application based on the general viewpoint of the user (employees).

2. System Context

This section shows the environment of the employee portal and the units with which it interacts. It helps to see how the application fits into the existing scheme of things while describing what the application will do.

3. Functional Requirements

This section precisely states the functions of the system – what it should do and what it should not. This section is split into subsections modelled after the real world activities like login, register, submit, upload etc. For example, a user cannot access the employee page from the company's home page unless he is a registered employee.

4. Non-functional Requirements

These are quality requirements that set the performance levels required of the application for various kinds of activities.

3.1 System Objectives

3.1.1. Employee portal system is a software application to assist employees of a company with activities related to editing their employee details, filling holiday forms, access and editing options to the organisations events calendar, calculating vacation time and pay, payroll, task tracking, filing reports, an e-copy of the employee handbook for quick references and an

additional CV upload and progress tracker page for prospective employees.

3.1.2. From the view point of HRM manager-

- Supports the tracking of individual employee date of hire, anniversary and event dates
- Supports the tracking of time and attendance reporting for salary employees
- Supports printing of payroll checks
- Supports the tracking of government payroll tax processing
- Supports the tracking of social security and providence payroll tax processing
- Minimise time lost due to bureaucracy
- Minimise tasks of HRM manager

3.1.3. Interview with HR personnel shows that HRM departments would respond favourably to an employee portal that satisfied or helped them satisfy the following objectives:

- Protect customers' privacy concerns.
- Check the validity of input data and give a feedback to the user in case of errors or inconsistency.
- Reduce effort and frustration of employees in putting in holiday applications
- Tracks employee sick and personal time allowed versus time taken

3.2 System Context

3.3.1 Employee portal system will provide the following types of easy-to-use and interactive web interfaces

- Employee portal system will be made accessible to users via the company webpage
- For current employees this will be through the employee page while for prospective employees this will be through the careers page
- The above will save the users the task of learning how to navigate completely new interfaces
- The employee portal system shall provide the following to users- easy and less stressful ways of communicating with supervisors and HRM manager as compared to the paper system
- The system and its environment and the interactions between them are depicted in the diagram below.

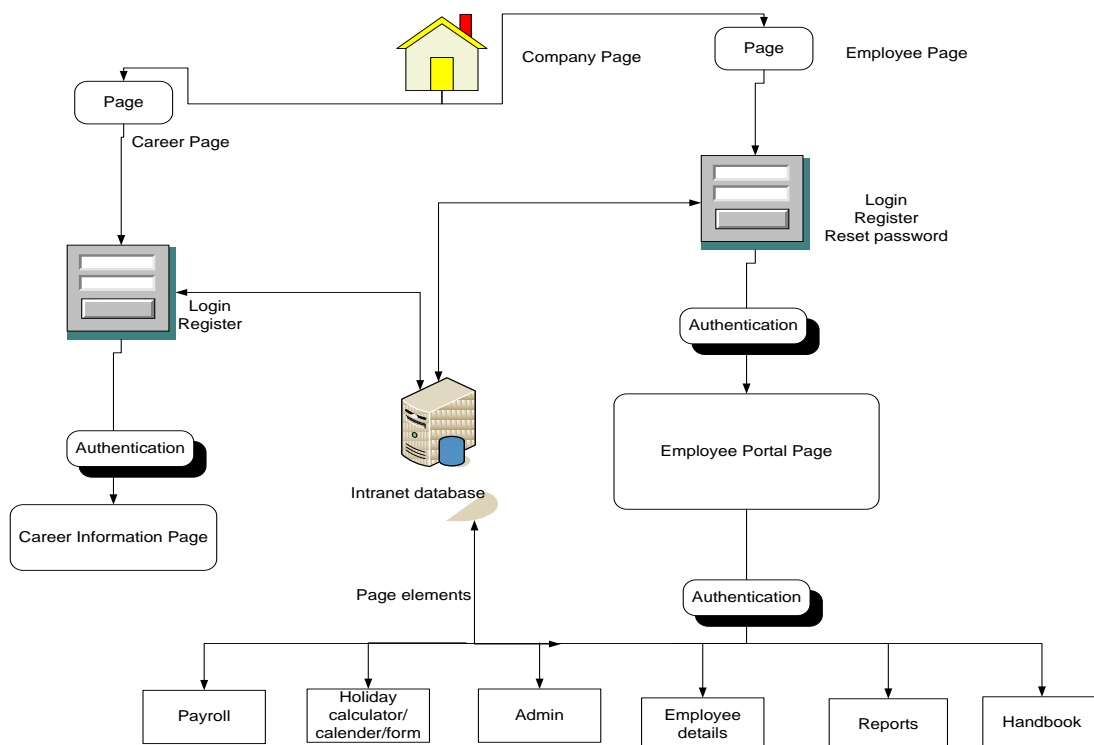


Figure 3.0.1 Interaction between Employee Portal System and internal database

The diagram shows the interactions between the Employee Portal software and the database inside the system. There are two interfaces, one for current employees and one for prospective employees, which can be accessed via internet. Current employees access the portal through the employee's page. Here they are required to login. After authentication they are directed to the employee portal home page. Here depending on their user access level, they may be given permission to access a page. There is one database comprising of various tables internal to the system and which the system maintains. In this database there are tables to store user account information, payroll data, holidays and calendar events, employee data and employment application data.

3.3 Functional requirements

3.3.1 *User accounts*

- The current employee or prospective employee, who will henceforth be called the 'user-employee' or 'user-prospective' respectively, will be presented with a login page as the first step in the interaction between him and the employee portal system. Here, the user-employee shall be presented with three main options. A user-employee can choose any one of these. A user-prospective shall be presented with two main options. A user-employee can choose any one of these. A user-employee/user-prospective's choice will be governed by whether he is a registered user or a new user. The terms 'registered user' and 'new user' are described below.
- A user-employee/user-prospective who has previously used the Employee Portal would have been given a user id and a password. He would have his personal information stored in a table in the database referred to earlier in section 2 as 'TB-Employee Details'/'TB-Prospective' respectively. This 'personal information' would be henceforth referred to as 'profile'. Such a user-employee/user-prospective with a profile in TB-Employee Details/TB-Prospective respectively shall be called a 'registered user'. A registered user will be able to have access to Employee Portal by logging into the system. A new user, on the other hand, would have to register him

with the system by providing personal information. In such a case, the new user becomes a registered user.

3.3.2 *Registration and creation of user profile*

The system shall require a user-employee/user-prospective to register, in order to carry out any transactions with it. It will ask the user-employee/user-prospective for the following information at the least – a user id, a password. The system will automatically create a profile for the user-employee/user-prospective which the user-employee/user-prospective will be required to complete after login.

3.3.3. *Checking job application progress*

The system shall present a registered user-prospective with their application status as it stands currently.

3.3.4. *Employee Handbook*

The system shall present a registered user-employee with an electronic copy of the employee manual for quick references.

3.3.5. *Editing employee details*

- Using the employee details provide at login, the system shall present the user- employee with their employee details as it stands currently.
- The system shall allow a user-employee to edit his profile. After editing, the user-employee has to submit the form to allow any changes to be saved in the database.

- At submission, the form shall be validated to ensure all necessary fields have been filled in. It shall also check to ensure that the fields were filled in the correct way. If the submitted form meets all the above requirements, TB-Employee Details is updated and the user-employee is presented with a copy of the information submitted.

3.3.6 Reporting

The system shall provide an easier way of creating and sending reports. It shall accomplish this in the following manner:

- The system shall allow a registered user-employee to upload reports to their supervisor. Uploaded reports shall be available for download to the person it is directed to.
- The system shall provide printable and Portable Document Formats (PDF) of reports to user-employees.

3.3.7. Payroll

- The system shall provide a user-employee with payroll calculations for a particular employee based on the employee's employee ID. The information presented to the user shall include their salary, allowances, gross pay, taxable pay, tax deductions, total deductions and net pay.
- The system shall allow a registered user-employee to print the payroll.

3.3.8 *Holiday form*

- The system shall present a user-employee with a form.
The user-employee may fill this form and submit.
- At submission, the form shall be validated to ensure all necessary fields have been filled in. it shall also check to ensure that the fields were filled in the correct way. If the submitted form meets all the above requirements, the details of form are saved in the database.

3.3.9 *Task menu*

The user-employee shall be presented with tasks required of them for a period. The tasks presented in this menu shall be updated as needed by the supervisor. The process by which this is done is beyond the scope of Employee Portal.

3.3.10 *Holiday Calculator*

The system shall provide the user-employee with information on how many days of leave he has and the pay that it goes with.

3.3.11 *Holiday Calendar*

The user-employee shall be presented with a calendar showing booked days for leave and events. This shall serve as a guide to planning. A user shall be cautioned when selecting an already booked date.

3.3.12 *Security*

- A user-employee/user-prospective shall only be presented with information pertaining to the user-

employee/user-prospective whose user details were presented at login.

- A user-employee shall only be permitted access to pages for which he has access level permission granted

3.3.13. Login/logout

- The system shall present user profiles, reports and assignments as they are in the database at login.

3.4. Non-functional requirements

3.4.1 Performance

- Response time of the Employee Portal should be less than 2 seconds most of the time. Response time refers to the waiting time while the system accesses, queries and retrieves the information from the database.
- System should be able to support a minimum of 100 users at a time.
- System shall show no visible deterioration in response time as the number of user-employee/user prospective or data increases.

3.4.2 Reliability

- Employee portal system shall be built using secure coding to protect it from SQL and PHP injection attacks
- Employee portal system shall be available 24 hours a day, 7 days a week

- Employee portal system shall always provide correct information about user-employee/user prospective
- Employee portal system shall be robust enough to have a high degree of fault tolerance. For example, if a user-employee/user prospective enters a wrong input, the system should not crash and shall identify the invalid input and produce a suitable error message.
- Employee portal system shall be able to recover from hardware failures and power and rollback the databases to their most recent valid state.

3.4.3 Usability

- Employee portal system shall provide content in accordance with company objectives and standards so that the users can easily adapt to this information system.
- Employee portal system shall provide an easy-to-use interface to enable an enjoyable worker-portal interaction.
- The web interface should be intuitive and easily navigable. Users should be able to understand the menu and options provided by Employee portal system.
- Any notification or error messages generated by Employee portal system shall be clear, succinct, polite and free of jargon.

3.4.4 ***Integrity***

- Only the system administrator has the right to change system parameters, such as login access levels, resetting of account etc.
- Users need to be authenticated before having access to any personal data.

3.4.5 ***Interoperability***

- Employee portal system shall minimize the effort required to couple it to another system, such as report database system.
- -System shall be compatible with any intranet/web

With the above requirements in mind, the employee intranet portal system was designed. The building process was divided into four segments; web pages design and creation, database design and creation, security and finally, structure and style. A thorough discussion and evaluation of these segments is done in the next chapter.

In building the system, the following languages and software were used:

- PHP (Hypertext Preprocessor):

PHP is an HTML-embedded scripting language. It is made up of syntax borrowed from C, Java and Perl and some unique PHP-specified features. It allows web developers to write dynamic web pages quickly. (PHP Group, 2010) PHP 5 is the current version. It is free and distributed by the PHP Group. PHP can be deployed on most web servers, operating systems and platforms. It can also be used with many relational database management systems. The

complete source code to build and customise is available for download on PHP.net.

- JavaScript:

JavaScript scripting language is a client-side method for validation and other simple tasks. While JavaScript is not a full-fledged programming language like PHP: it is good for interacting with a form and for controlling the display of data to the user. (Lane & Williams, 2004)

- XAMPP for Windows:

A web server was needed to implement the first segment. To solve this problem, XAMPP for Windows was installed. XAMPP is an open source cross-platform web server package, consisting mainly of the Apache HTTP Server, MySQL database, and interpreters for scripts written in the PHP and Perl programming languages (Apache Friends, 2009). All the web pages created were saved in XAMPP's main directory for WWW documents; `\xampp\htdocs`. This allowed the results of PHP code in the web pages to be viewed.

Chapter 4

Discussion and Evaluation

4.1 Discussion

4.1.1 Web Page Design

Portal Home

This is the first page after login as shown in Figure 4.1. A navigation bar on the left presents employees with a link to other pages of the portal. A spry accordion on the right provides employees with a list of tasks they may perform and a report manager to upload reports. Uploaded reports are saved to a folder. The main frame of the page is divided into two parts. The upper part provides employees with the latest on company news while the lower part gives employees with departmental news.



Figure 4.1. Employee Self Service Portal Home

Employee detail

This page as shown in Figure 4.2 presents employees with a form to collect personal employee data. This form if filled correctly will submit information on the employee to the database. This page presents an employee with an editable form of his employee details pulled from the database based details on the information provided at login. This way, only fields that require editing will be re-filled and submitted. This design is better than presenting an employee with an empty form to enter data on themselves because while the latter comes with the advantage that the same basic form can be used for every employee, the downside is that the employee is given the unpleasant task of having to re-fill every required field and submit the form before an update can be performed.



The screenshot displays a web application interface for '3d Business Solutions'. The header features the company logo and a navigation bar with links: Home, Services, Employees, About us, and Contact us. A left sidebar contains a menu with options: Home, Employee Handbook, Employee Detail (selected), Payroll, Holiday Form, Holiday Calculator, and Logout. The main content area is titled 'EMPLOYEE INFORMATION' and contains a form with the following fields: Employee id (111), Username (nrlawson), Position (dropdown), and Department id (dropdown). Below this is a section titled 'PERSONAL DETAILS' with fields for First Name (Nina), Middle Name (Rose), Last Name (Lawson), Phone (234518), and Email (xer@grtrs.com).

Figure 4.2. Employee details

Holiday calculator

The holiday calculator page as shown in Figure 4.3 tells a user how many off days he has and the pay it comes with. Based on user information presented at login, the system pulls all its information the holiday table in the database the user and displays it to the user.

The screenshot shows a web browser window with the URL `http://localhost/AppliedProject/web/HolidayCalc.php`. The page features a header with the logo "3d Business Solutions" and a navigation menu with links: Home, Services, Employees, About us, and Contact us. On the left, there is a sidebar menu with links: Home, Employee Handbook, Employee Detail, Payroll, Holiday Form, Holiday Calculator, and Logout. The main content area is titled "HOLIDAY CALC" and contains a form with the label "Enter Employee id:" and a text input field. Below the input field is a "Calculator" button. The "RESULTS" section displays three rows of data: "Days entitled" with the value 20, "Days taken" with the value 5, and "Days remaining" with the value 15. Each value is displayed next to a text input field.

HOLIDAY CALC	
Enter Employee id:	<input type="text"/>
<input type="button" value="Calculator"/>	
RESULTS	
Days entitled	<input type="text" value="20"/>
Days taken	<input type="text" value="5"/>
Days remaining	<input type="text" value="15"/>

Figure 4.3. Holiday Calculator

Holiday calendar

This page as shown in Figure 4.4 presents an employee with a calendar of the company's events and leave days booked for a period. In applying for a training program or leave of absence, an employee may consult the calendar to know which days are appropriate.

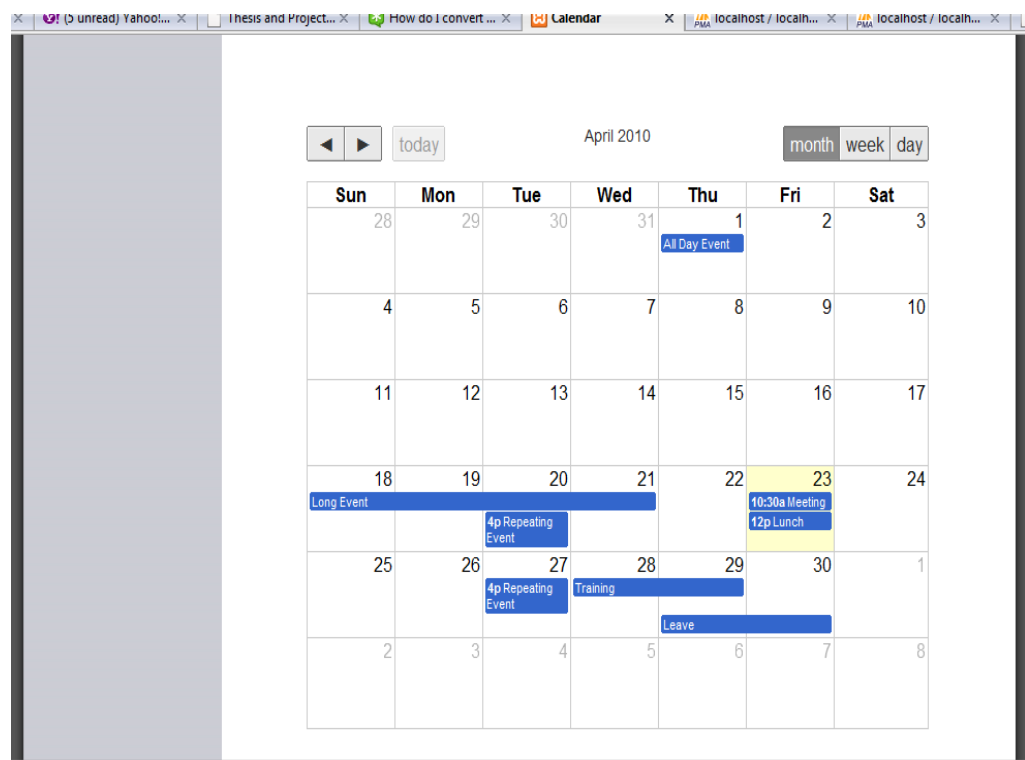
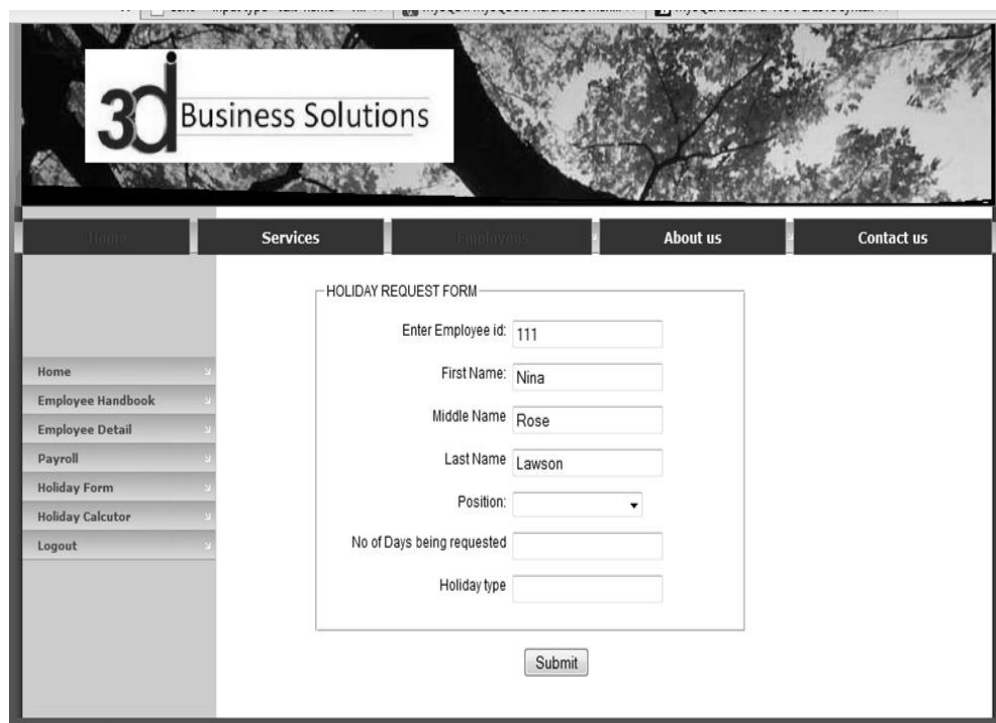


Figure 4.4 Calendar

Holiday Request Form

This page as shown in Figure 4.5 presents the user with a form. The form collects data on number of days requested and type of leave being requested. All other information on the user required to make the form complete are pulled from the holiday table in the database. This way the user is saved the task of manually completing all fields in a holiday form.



The screenshot displays the 3d Business Solutions website. The header features the company logo and a navigation menu with links to Home, Services, Employees, About us, and Contact us. A left sidebar contains a list of links: Home, Employee Handbook, Employee Detail, Payroll, Holiday Form, Holiday Calculator, and Logout. The main content area is titled 'HOLIDAY REQUEST FORM' and contains the following fields: 'Enter Employee id:' with the value '111', 'First Name:' with 'Nina', 'Middle Name:' with 'Rose', 'Last Name:' with 'Lawson', 'Position:' with a dropdown arrow, 'No of Days being requested:', and 'Holiday type:'. A 'Submit' button is located at the bottom of the form.

Figure 4.5. Holiday request form

Payroll

This page as shown in Figure 4.6 consists of a textbox and a submit button. Based on the input entered in the textbox above, payroll computations are performed and the details printed on the page. The details printed include basic salary, 5% SSF, basic salary less SSF, allowances, employee provident fund, taxable pay, tax and net

pay. The required input for the textbox is employee id. The employee id entered is matched against a position and the salary that goes with that position is used to compute the payroll. For the HR manager, this page may be used to prepare payrolls for every month while keeping an archive of previous payrolls. For employees, this page provides them with an opportunity to see their most recent pay slip. This is a better approach than making the required input salary. While that could have worked, it creates room for errors. The wrong salary amount could be entered in for an employee.

RESULTS	
Basic Salary:	1000
5% SSF:	50
Basic Salary less SSF	950
Other allowances	300
Employee Provident Fund	70
Taxable Pay	1320
Tax	217.5

Figure 4.6. Payroll

Admin

This page as shown in Figure 4.7 provides an administrative user with the ability to edit user accounts and set access levels.

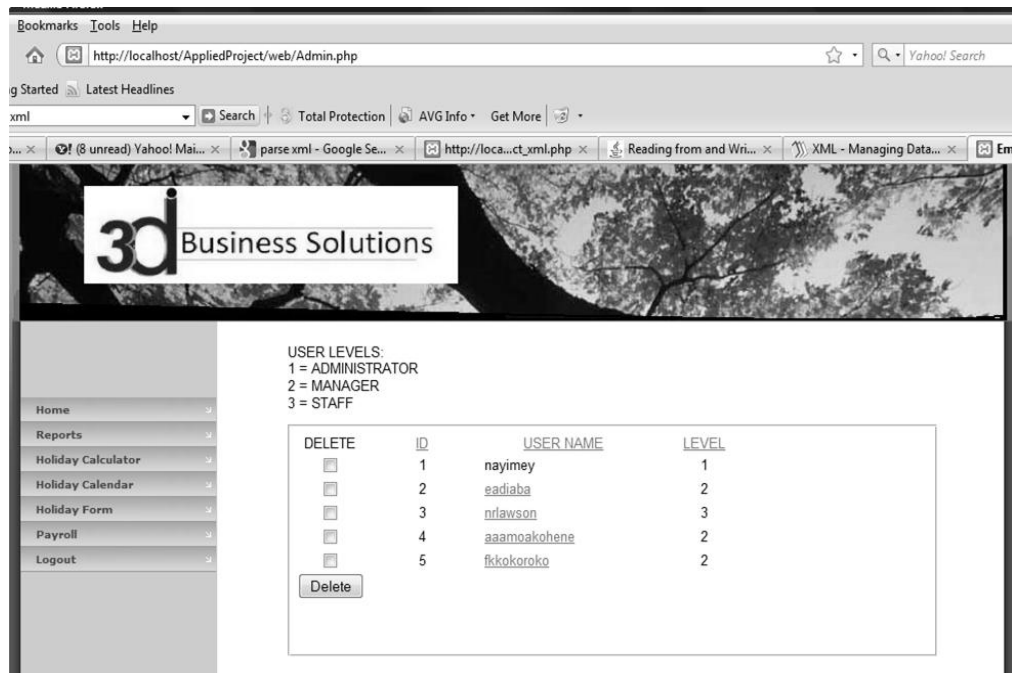


Figure 4.7. Admin

4.1.2 Database

This segment involved the design of the database to which the employee portal will be connected. In creating the database the MYSQL database platform in the XAMPP for windows package was used. After the process of normalisation, twelve tables were created. (For a detailed explanation of the database schema please refer to the appendix):

Employee info

This table stores biological data, personal details and employment data. It is populated by data collected from the 'E_details' form in the employee details page by POST action.

Employee addresses

This table stores employee addresses only. The information stored in this table also comes from the 'E_details' form in the employee details page.

payroll

This table stores the result from payroll computations posted from the payroll page.

CV upload

This table keeps track of the indexes of files stored in the cv_upload folder.

access

Access levels permissions for employees are stored in this table.

password

This table stores username and password of registered employees.

applicants

This table stores registration details of users who want to upload their CVs on the Careers page.

report upload

This table keeps track of the indexes of files stored in the report_upload folder.

4.1.3 Security

This segment was solely about making sure the employee portal system meets basic security requirements. To this login and authentication, logout and also access levels are implemented.

Login

Since the employee portal system is to be integrated into the company's website it is necessary to implement login to ensure only

employees get access to the system. Again, information being presented via the portal will be information only meant for the internal company environment. Thus upon clicking on the employee tab on the company website, a user is presented with a form for login. Here the user is required to enter a correct username and password. The details submitted are then cross-checked against what has been saved in the database. If the details are found to be correct, the user gains access to the portal.

Users who have forgotten their passwords may click on the reset password link. The link takes them to a page with form where they are required to enter their username. Once they do this a temporary login password will be e-mailed to the e-mail address found against that username in the database.

Authentication

To prevent an individual who knows the address of the portal from bypassing login to gain access, authentication was applied to all the pages of the portal. This way, before access is granted to a user to view the contents of a page within the portal, there must be proof of that user's login. To do this, PHP sessions is used. When a user logs in to the system, a session is started. The user's username, password and employee id are all stored in the created session. When a user tries to access a page within the employee portal, the system checks whether there is an active session with that user's id. If the check shows an active session, the user is granted access, otherwise he is redirected to the login page.

Logout

The sessions implemented at login and authentication meant that, unless there is a way to end sessions they will continue to be active, providing access to pages and defeating the whole purpose of login and authentication. Logout calls functions that deactivate a session and exits the employee portal. This way login will be required to regain access to the employee portal.

Access Levels

To control what pages can be accessed by individuals and maintain a level of confidentiality, access levels controls are implemented in building the employee portal system. Three main levels of access are defined; 1, 2 and 3. Level 1 is reserved for administrative permissions, level 2 for managerial permissions and level 3 for employee permissions. During authentication, the system also checks whether the user has the appropriate access level permission to view the page before granting or denying access.

4.1.4 Reports

The system may be used to generate reports. For example the payroll page presents the user with complete payroll details rather than just the net pay. This result can be printed and filed as a pay slip. The employee details page may also be used to generate reports on the number of male or female employees in the company/organisation. The calendar feature may also be used to generate a report on planned company events for a period.

PAYROLL

Enter Employee id:

RESULTS

Basic Salary:	<input type="text" value="1000"/>
5% SSF:	<input type="text" value="50"/>
Basic Salary less SSF	<input type="text" value="950"/>
Other allowances	<input type="text" value="300"/>
Employee Provident Fund	<input type="text" value="70"/>
Taxable Pay	<input type="text" value="1320"/>
Tax	<input type="text" value="217.5"/>
Net Pay	<input type="text" value="1102.5"/>

Figure 4.8. The Payroll calculator may be used to generate payroll reports

4.2 Evaluation

A session of rigorous testing and evaluation was carried out at the end of each segment and changes made to the system.

On completion of this project, the goal was to test for how well the system overcame the managerial, technical and social challenges associated with developing employee portals discussed in the beginning paragraphs of this paper.

The measure of how well the system overcomes managerial challenges was based on the hardware and software requirements and the necessity for training. No extra hardware requirements are needed to implement the system. The software requirements for the system are open-source and the system does not require extensive staff training as it is a web

application; not too different from a website. A Manual will also be provided to give any needed help on how the system works. Thus, the system can be said to have successfully overcome the managerial challenge.

The measure of how successful the system is in overcoming the social challenges was based on the ability of the system to regulate access to information. If the system permits a user to access information he is not entitled to, it will mean a failure of the system in overcoming social challenges. However, if the system blocks access to information a user does not have permission to access then the system has been successful.

In checking for how well this project overcomes the technical challenges, the number of clicks a user has to make before completing a desired task or viewing a desired page was tracked. The average number of clicks was 3, which falls within the three-click-rule. Also, the ease with which a non-IT person is able to use the system with no help from an IT person was used to measure how friendly interaction with the system is. The system scored eight out of ten on the average.

The approach used in developing the employee self-service portal is a step in the right direction because it integrates IT into HRM in a way that does not interrupt the HRM process. It simply simplifies a lot of what HRM functions require and helps them to achieve their objectives in a more efficient way. However, the employee self-service portal system would have been better if it was available anywhere and at anytime. An improved employee self-service intranet portal may also be designed with distributed databases in mind. The web interface of the employee portal

system may be linked to an organization's database. Thus, no matter where the database of the company is situated, the web interface provides an easy way for the editing of employee information.

Chapter 5

5.1 Limitations and Conclusion

A limitation of the system is the inability of employees to interact with the portal via their mobile phones. This project was about designing and building an employee self-service intranet portal that addresses the challenges pointed out in the first chapter. The first challenge was in the managerial context. To tackle this, a study of what human resource management is was done. Based on the knowledge acquired, a decision was made on what HRM activities if incorporated into the system will yield the desired result. The desired result here is a system that increases the effectiveness of HRM functions and helps in attaining an organisation's objectives. This system improves employee communications and information sharing by providing access to correct and timely information. It also encourages employee participation in the HR process. Again it does not require staff training before implementation. Thus this project is justified in the managerial context.

The actual design of the system involved the creation of web pages and a database to store information. In creating the web pages care was taken to ensure user-friendliness. This included making sure that the interface and navigation was simple and reliable. This way IT knowledge will not be a prerequisite to using the system. Thus, this system satisfies the technical challenges discussed in chapter 1.

The system also ensures confidentiality by using permissions to control what pages the user can access. It also ensures that no employee feels at

a disadvantage when it comes to information sharing. Therefore, the system can be said to have addressed the social challenges.

Overall, the project has been a success as an employee self-service intranet portal that meets the user requirements specified has been built.

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Appendix

Database Schema

TB-employee_info

This table stores personal. It is made up of eleven columns; 'EmpID', 'username', 'Firstname', 'Midname', 'Lastname', 'Gender', 'Age', 'Position', 'DeptID', 'Email', and 'Phone'. 'EmpID' is the primary key and 'username' an alternate key. All the columns except 'EmpID' are populated based on

data collected from the 'E_details' form in the employee details page by POST action. 'EmpID' is an auto-generated number in the table.

TB-employee_addresses

This table stores employee addresses only. It has as a primary key 'EmpID' which is also a foreign key from TB-employee_info. The information stored in this table comes from the 'E_details' form in the employee details page.

TB-payroll

This table stores the result from payroll computations. It is made up of nine columns; 'EmpID', 'FirstName', 'LastName', 'BASIC SALARY', 'OTHER ALLOWANCES', 'EMPLOYER PROV. FUND', 'TAXABLE PAY', 'TAX', and 'NET PAY TO BANK'. 'EmpID' is the primary key which is also a foreign key from TB-employee_info. All the columns are populated based on data posted from the payroll page.

TB-cv_upload

This table keeps track of the indexes of files stored in the cv_upload folder. It is made up of three columns; 'cv_id', 'cv_name', 'cv_type', 'cv_size', and 'cv_content'. These store information on the file uploaded.

TB-access

Access levels for employees are stored in this table. The table has three columns; 'ID', 'Access_level_id' and 'EmpID'. 'ID' is the auto-generated primary key and 'EmpID' is a foreign key from TB-employee_info.

TB-p_wordtable

This table stores username and password. Made up of three columns; 'EmpID', 'username' and 'password', it has as a primary key 'EmpID' which is also a foreign key from TB-employee_info. The information stored in this table comes from the 'register' form in the register page accessed by the register link presented at login.

TB-e_wannabe

This table has six columns; 'ID', 'cv_fname', 'cv_mname', 'cv_lname', 'cv_uname' and 'cv_password' which store registration details of users who want to upload their CVs on the Careers page.

TB-report_upload

This table keeps track of the indexes of files stored in the report_upload folder. It is made up of three columns; 'id', 'name', 'type', 'size', and 'content'. These store information on the file uploaded.

