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**I**

**NTRODUCTION**

**1.1**

**O**

**VERVIEW**

Payroll Management System is the administration of the financial record of employees' salaries,wages, bonuses, net pay, and deductions.

This project is carried out as a partial fulfillment of thedegree of BSc in Computer Science & Engineering.

 Nowadays this kind of application is veryessential for any small or medium sized organization. An employer, regardless of the number ofworkers they employ, must maintain all records pertaining to payment system digitally. To completethe project we have

investigated the current system of ‘The People’s University of Bangladesh’ and

finally we are able to establish such a system which automate all the process of a typical pen andpaper based payroll management system. With this system it is very to organize the whole employeedetails and their basic salary, their increment, conveyance allowance, automatically adjust theoverload, advance payment and subsequently generate complex reports from these information.

**1.2**

**B**

**ACKGROUND TO THE**

**S**

**TUDY**

Payroll management is a very common task for any business which has a number of employees.

Though the method differ from organization to organization. The payroll system of the People’s

University of Bangladesh had a manual system using ledger books to keep track of every single

employee’s salary history, calculate whether it is time to increment and to calculate other things like

conveyance allowance, overhead, bonus and finally the salary could be determined. This pen andpaper based system is much time consuming and there is a great chance to make mistake as thereare very good number of employees in this organization and keeping patience is a tough job tomanipulate so many things.

Unauthorized persons however, easily accessed the paper systemand hence making it impossible to keep secrecy and confidentiality. So such a system is timeconsuming, prone to errors of entry and analysis resulting from the fatigue of the users.

Now if we view the system from the other employees’

 (who are the end user of the system)point of view, then the system is also monotonous. Because if one employee wants to checkhis/her statistics of the salary record then it is very difficult to get it without any help ofautomated system.

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3

So, it is obvious to migrate the whole process in an automated way so that

which help theauthority and user to maintain all the things with ease.

**1.3**

**W**

**EB**

**B**

**ASED**

**M**

**ANAGEMENT**

**I**

**NFORMATION**

**S**

**YSTEM**

Accessing databases using a web browser as if accessing a normal database application system can

be a very significant advantage. Today’s database systems can be very efficient in processing large

amounts of data by using different type of sources. Any information that can be defined by a relationcan be fed into a database system, however making information available on the Web requiresaccessing the database via a special-purpose programming language called SQL (Structured QueryLanguage) and by converting it to a markup language such as HTML or XML.Firstly, to understand this system, we have to understand the meaning of the Web and how it can beintegrated to a database. The WWW is a system of interlinked hypertext documents based on a

computer network called Internet. It is officially described today as a “wide

-area hypermedia

retrieval initiative aiming to give universal access to a large universe of documents”. However, in

order to take full advantage of these uses one must certainly be connected to the Internet and mustuse some kind of software package called web browser that understands markup languages (i.e.hypertext, hypermedia).An addition requirement of the system is to integrate the web front end to with the database backend. Many technologies exist that can be adapted in order to integrate a web based front end to a

database. By analyzing each technology’s strengths and weaknesses it will be easier for the system

to be developed to provide the most optimal Web-to-database access and Endnote compatibility.Using more automated facilities for publication purposes will significantly improve the currentsystem by decreasing the workload of specific members of staff and by increasing their productivity.

**1.4**

**S**

**TATEMENT OF THE**

**P**

**ROBLEM**

The current payroll management system at

The People’s University of Bangladesh

 exhibited a lot ofineffectiveness and inefficiency that had farfetched impact on the decisions taken by management.The system, which was manual that is based on paper based to calculate salary and otherinformation of employees, keep records of these data and analyze results had weakness that neededIT based solutions. The system was characterized by delays and sometimes failure to access

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4

**1.6**

**F**

**EASIBILITY**

**S**

**TUDY**

Before developing this project we need a feasibility study to understand whether the project wouldbe successful or not. Feasibility study is detailed analysis of any system. The two criteria to judgefeasibility are cost required and value to be attained.

**Factors of Feasibility Study:**

i.

**Technology and system feasibility:**

 The assessment is based on an outline design of systemrequirements, to determine whether the company has the technical expertise to handlecompletion of the project.

In our case, ‘The People’s university

of Bangladesh’ has an

efficient IT department and the personnel from the accounts department has that expertise.ii.

**Economic feasibility:**

Economic analysis is the most frequently used method for evaluatingthe effectiveness of a new system. More commonly known as cost/benefit analysis, theprocedure is to determine the benefits and savings that are expected from a candidatesystem and compare them with costs. If benefits outweigh costs, then the decision is madeto design and implement the system. The analysis must accurately weigh the cost versusbenefits before taking an action.It is important to identify cost and benefit factors, which can be categorized as follows: 1.Development costs; and 2. Operating costs. This is an analysis of the costs to be incurred inthe system and the benefits derivable out of the system.The development cost of the proposed system is affordable for any organization like ThePUB. And it needs no operating cost as to implement the system, they do not need purchaseany extra equipment. Current hardware and network system is more than requirement forthe future system. Again there is no training cost associated to cope up with the system.iii.

**Operational feasibility:**

Operational feasibility is a measure of how well a proposed systemsolves the problems, and takes advantage of the opportunities identified during scopedefinition and how it satisfies the requirements identified in the requirements analysisphase of system development.After analyzing the problems of the current system and the benefits of the proposed system,it will be clear that the proposed system will not be considered as loss at all.

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6

**1.7**

**B**

**ENEFITS OF OUR SYSTEM**

Payroll Management System developed for ‘The People’s University of Bangladesh’ gives them the

power to:



Interact with the software with menu-driven programs with user friendly interface.



Manage Employee Information

Efficiently.



Maintain Allowances (conveyance, festival), deductions, overloads details for the employees.



Manage increment of the employees automatically.



Efficiently manage the advance payment taken by the employees.



Prepare the detailed salary record of all the employees in an organization.



Generate Pay-Slip for all employees

at the convenience of a mouse click.



Generate reports

according to the requirement of the management.

8

**2**

**METHODOLOGY**

**2.1**

**I**

**NTRODUCTION**

In this chapter we discuss the approach used to achieve the objectives of the project. The techniquesused to achieve the user requirements and the technologies used in the designing of the system.

**2.2**

**F**

**ACT**

**F**

**INDING**

**T**

**ECHNIQUES**

**2.2.1**

**Data Collection**

The supervisor opted for this type of fact finding technique because at first we should know thebasic procedure of payroll management system. So we queried the accounts section of our

concerned organization ‘The People’s University of Bangladesh’ for relevant data which helps us to

realize the current procedure of managing payroll. We collect the necessary papers which are usedto manage this operation and so we are able to develop such a system which is fully compliable tothe current system as the users does not need extra effort to cope up with the new digital system.

**2.3**

**W**

**EB**

**A**

**PPLICATION**

**T**

**ECHNOLOGIES**

A web application is an application that runs on a web server and is accessed by users over theInternet or a local intranet. Web applications usually consist of static resource files (e.g. Images),web components, helper classes and libraries. A web browser is commonly used as a thin clienthence all the processing is done on the server. Web applications are usually organized in a three-tierarchitecture

 –

 a user interface level, a functional process logic level and data storage level. A webbrowser is the user-interface level and dynamic web content technology such as PHP, ASP.Net orJava Servlets, is used in at the functional (business logic) level. Data Storage is handled by a database.Web applications are an extension of a web server. Web applications are either service oriented orpresentation oriented. A presentation oriented web application produces interactive web pagescontaining markup languages like (XML and HTML) and dynamic content in response to requests.

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9Many of these open source LAMP (Linux, Apache, MySQL and PHP). A service oriented webapplication then implements the endpoint of the web service.

**2.3.1**

**Linux, Apache, MySQL and PHP (LAMP)**

Linux, Apache, MySQL, and PHP (LAMP) are a set of software increasingly being used to run dynamicweb sites. Their popularity arises from the fact that they are basically free. These open sourcesoftware can be easily downloaded from the internet, or come bundled with Linux distributions(WWW2). So we choose this architecture as our development platform.

**2.3.2**

**MySQL**

MySQL is a multithreaded, multi-user, SQL relational database server. Programming languages thatcan access a MySQL database include C, C++, Java, PHP, and Perl. The MyODBC interface allowsother programming languages which support the ODBC interface to communicate with MySQL.MySQL runs on many different operating systems including Linux and Windows.

**2.3.3**

**PHP**

PHP stands for Hypertext Pre-processor. It is mainly used as a general purpose scripting languageused to develop dynamic web content and can be embedded in HTML. PHP is easy to use and is verysimilar to structured programming languages like Perl. PHP is more than just a scripting language. Itis a full programming language and can be used from a command line and also be used to developGraphical User Interface Applications. PHP runs on many of the major operating systems, includingLinux and windows and also supports many database systems, including MySQL. One feature thatleads to the popularity of PHP is that it is dynamically typed. Variables do not have to be declaredand they can hold any type of object. The arrays in PHP can hold objects of different types, includingother arrays. PHP includes many open-source libraries and includes modules built in for accessingFTP and database servers.

**2.3.4**

**HTML and CSS**

Hypertext Markup Language (HTML) is based on the Standard Generalized Language (SGML). HTMLis a language for describing the structure of a document, not its presentation. HTML defines a set ofcommon styles for web pages: headings, paragraphs, lists and tables. HTML provides a means bywhich a documents main content can be annotated with various kinds of meta-data and renderinghints. Adobe Dreamweaver is the leading software tools for editing HTML. Content and presentationcan be combined using server side scripting languages like PHP and ASP.Net to make the final HTML.3.4 Chosen Web Application Technologies

10

12

**3**

**SYSTEM**

**ANALYSIS**

**AND**

**DESIGN**

**3.1**

**I**

**NTRODUCTION**

Following the literature review, background information and correlative knowledge regarding thisresearch project follows. In the first part of this chapter, the demand and requirements of theproposed system are discussed and analyzed through dataflow diagrams, the entity relations modeland the data dictionary. According to this analysis, the specification of the system is defined.

**3.2**

**R**

**EQUIREMENT**

**A**

**NALYSIS**

The requirement analysis stage of a software engineering project involves collecting and analyzinginformation about the part of the organization that is supported by the application. This informationis then used to identify the users' requirement of the new system.

**3.2.1**

**Requirements**

The requirements of the Web-based management information system are to develop:



A web based front end for entering employee and all payroll related details includingmaintaining allowances (conveyance, festival), Deductions, overloads details for theemployees.



A web based front end for calculating and print the salary information of all the employees

of The People’s University of Bangladesh.



A facility to produce summary information (i.e. report) of payroll related activities.

**3.2.2**

**Other Requirements**

The system must be developed to suit the particular needs of a user-friendly environment. Thismeans that the system must accommodate a clearly understandable user interface as well as clearonline help documentation at any stage of the user interaction with the system. A fast response timein obtaining and providing information to the system may also prove to be a significant advantage. Inaddition to these requirements, the system should also embrace the following requirements:

**Security:**

Each user is required to log in. The system should log staff that has been assigned usernames and passwords. The system should be designed to make it impossible for anybody to logon

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13without a valid username and password. Data encryption should be employed to keep the user loginname and password secret.

**Reliability:**

The system would be used by the accounting section of

The People’s University of

Bangladesh. Since this application is subject to process monetary matters, this should must bereliable to the users of this application.

**Ease of Use:**

The views and operations should be easy to use and intuitive. Documentation should beprovided.

**Performance:**

The system should have a quick response time.

**System and Browser compatibility Testing:**

The system should be accessible on the most of themodern browsers.

**System requirements:**

This system would be designed to run on a minimum hardware configurationlike 500MHz x86 machines. Considering the vast hardware available nowadays, this would not poseany problems.Server Software:Operating System: Linux, Windows 2000, or Windows XPPHP version: PHP 5.0+Web Server: Apache Web Server 2.0+Database: MySQL 4.01+

**3.3**

**D**

**ESIGN**

**P**

**HASE**

The design involves the production of technical and visual prototypes. This stage has some non-technical aspects such as gathering of web content. For the server side programming and othertechnical aspects of the design emphasis will be laid on such design concepts and principles aseffective modularity (high cohesion and low coupling), information hiding and stepwise elaboration.The goal is to make the system easier to adapt, enhance, test and use.

**3.3.1**

**Producing HTML**

There are basically 4 methods of producing HTML

 –

 1.

Coding by hand using a simple text editor2.

Translation in which content produced in a tool such as notepad is saved as a HTMLdocument.3.

Using a tagging editor that helps fill in the required tags

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144.

Using a “What you see is what you get editor” (WYSIWYG) such as Adobe Dreamweaver.

 All these methods have their advantages and disadvantages.While coding by hand may be slow and error prone, it does provide great control over markup, aswell as help address bugs and new HTML/XHTML elements immediately. At the other extreme,

‘What You See Is What You Get’ (WYSIWYG) editors provide visual representation of a page and

require no significant knowledge of HTML or CSS. However these kind of editors give the efficientdevelopers much more potentiality. Putting all these into consideration, a WYSIWYG editor, AdobeDreamweaver was chosen for this work.

**3.4**

**D**

**ATABASE**

**D**

**ESIGN**

Database design involves the production of a model of the data to be stored in the database. A datamodel is a diagram of the database design that documents and communicates how the database isstructured.The design process is divided into three main stages

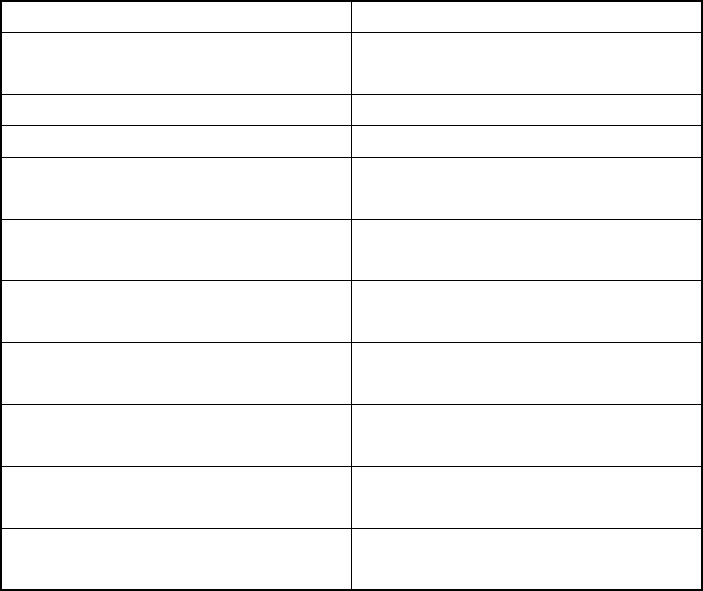
 –

 conceptual, logical and physical databasedesign. The purpose of the conceptual database design is to decompose the design into moremanageable tasks, by examining user perspectives of the system. That is, local conceptual datamodels are created that are a complete and accurate representation of the enterprise as seen bydifferent users. Each local conceptual data model is made up of entity types, relationship types,attributes and their domains, primary keys and integrity constraints. For each user view identified alocal conceptual data model would be built. In building the conceptual data model, a data dictionaryis built to identify the major entities in the system.

An entity relationship (ER) diagram is used to visualize the system and represent the user’s

requirements. The ER diagram is used to represent entities and how they relate to one another. TheER diagram also shows the relationships between the entities, their occurrence (multiplicities) andattributes.

odel that includes multiplicityconstraints gives a better representation of the system. Relationship descriptions and themultiplicity constraints are recorded in the data dictionary. Each model is validated to ensure itsupported the required transactions.



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**Entity Name Attributes DescriptionDataTypeSize Nulls**

pub\_departmentpub\_department\_id Department ID Int 11 Nopub\_department\_name Department Name varchar 64 Nopub\_employee\_detailspub\_employee\_id Employee ID int 11 Nopub\_designation\_id Employee Name int 11 Nopub\_employee\_joining\_date Joining Date Date Nopub\_employee\_termination\_date Termination Date Date Yespub\_employee\_name Employee Name varchar 64 Nopub\_employee\_department Employee Department varchar 64 Nopub\_employee\_address Employee Address Varchar 256 Nopub\_employee\_contact\_no Contact No varchar 64 Nopub\_employee\_email Email varchar 64 Nopub\_employee\_provident\_fund\_percentage Provident Fund int 11 Nopub\_employee\_starting\_salary Starting Salary decimal (10,0) Nopub\_designationpub\_designation\_id Designation ID int 11 Nopub\_designation\_name Designation Name varchar 64 Nopub\_payheadpub\_payhead\_id Pay-head ID int 11 Nopub\_payhead\_name Pay-head Name varchar 64 Nopub\_payhead\_default\_value Default Value decimal (10,1) Yespub\_deduction\_headpub\_deduction\_head\_id Deduction ID int 11 Nopub\_deduction\_head\_name Deduction Name varchar 64 Nopub\_deduction\_head\_default\_value Default Value decimal (10,0) Yespub\_advance\_paymentpub\_advance\_payment\_id Advance Pay ID Int 11 Nopub\_employee\_id Employee ID Int 11 Nopub\_advance\_payment\_date Advance Payment date Date Nopub\_advance\_payment\_amount Amount int 11 Nopub\_overload\_paymentpub\_overload\_payment\_id Overload Pay ID Int 11 Nopub\_employee\_id Employee ID Int 11 Nopub\_overload\_payment\_date Pay Date Date Nopub\_overload\_payment\_amount Payment Amount int 11 Nopub\_increment\_paymentpub\_increment\_payment\_id Increment ID Int 11 Nopub\_employee\_id Employee ID Int 11 Nopub\_designation\_id Designation ID Int 11 Nopub\_employee\_joining\_date Employee Joining Date Date Nopub\_increment\_payment\_date Increment Pay Date Date Yespub\_increment\_amount Increment Amount int 11 Nopub\_conveyance\_allowancepub\_conveyance\_allowance\_id Convinced ID Int 11 Nopub\_designation\_id Designation ID Int 11 Nopub\_conveyance\_allowance\_amount Convinced int 11 Nopub\_festival\_allowancepub\_festival\_allowance\_id Festival ID Int 11 Nopub\_festival\_allowance\_date Allowance date Date Nopub\_festival\_allowance\_perchantage Allowance Percentage int 11 Nopub\_paid\_salary pub\_paid\_salary\_id Salary ID Int 11 No



17

pub\_employee\_id Employee ID Int 11 Nopub\_month\_of\_salary Month of Salary Date Nototal\_salary Total Salary Decimal (11,0) Nopub\_salary\_payment\_date Salary Payment Date Date Nopub\_salary\_paid Salary Paid varchar 64 No

**Table 3.2**

Description of attributes from different entities

**Entity Name Cardinality Relationship Entity Name Cardinality**

Department 1 Has Employees 1..\*Designation 1 Posed by Employees 0..\*Designation 1 HasConveyanceAllowance1Employee 1 Has Salary Increment 0..\*Employee 1 GetsOverloadPayment0..\*Employee 1 Gets Regular Salary 1..\*

**Table 3.3**

 An extract from the data dictionary showing a description of the relationshipsbetween the entitiesFrom the above relationship we can draw the Data Flow diagram (DFD). A data flow diagram (DFD) isa graphical representation of the

‘

flow

’

 of data through an information system, modeling its processaspects. These are a preliminary step used to create an overview of the system which can later beelaborated. A DFD shows what kinds of information will be input to and output from the system,where the data will come from and go to, and where the data will be stored. DFD greatly helps us todevelop the front end of our system and to get clear sense of flow data from one entity to other.