

A Review of Computerized Payroll System

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Abstract: Payroll is a critical operation for every organization to pay employee accurately their salary and enrollments on time.[1]The idea of taking control of employees pay calculations are quite tedious if done manually and require more effort and time mainly for big organizations. Hence if this process is automated, it would be of great benefit as it would require less time to calculate the salary of the employees. The software for payroll management system service on the cloud is provided as a solution in this paper.[2] This system provides multiple user data access. Each user like employee or HR or admin can login into the software by writing username and password which are allocated to them from the company. It involves keeping track of hours worked and is capable of keeping a record of employee data including their pay, allowances, deductions and taxes on monthly bases so that fresh definitions are reflected from the month onwards, which leaves all the past data intact.[3] The proposed payroll system is advantageous as it provides a user friendly environment and also increases security and minimizes human calculation errors.

Keywords: Cloud Computing, Payroll System, 3-tier architecture, Payroll Working Process, Manual Payroll, Computerized Payroll, JavaScript, CSS, HTML, Ajax and JSON.

I. INTRODUCTION

A. Computer based payroll system

In an organization, there are many departments and each department has a payroll section to manage its payroll activities. Each section has to perform necessary operations like data collection and preparation, entry, updates, monitoring and reporting of data. Many of these existing practices and procedures need to be reassessed at this time of changing needs, changing demands of employees and changing technologies [4]. With this payroll system, payroll section would be able to keep a record of employees including their personnel data, pay slips, allowances, deductions, leave, savings and taxes etc..

Net pay of each employee is calculated by his allowances and deductions mentioned according to the company rules. The individual pay slips are printed out as a receipt if employee wants to get a print out. Pay bands, grade pay, allowances, deductions and tax information are updated if there is any amendment in salary structure. The computer based payroll application is a web-based design. The server-side of this application is partitioned in terms of logic into three-tiers or layers. [5]

Each layer performs a different function and the layer partitioning is as follows:

1) Presentation Layer: Presentation Layer is nothing but it is a user interface which every user see on the computer, mobile and window screen. Designing part of any application is known as Presentation Layer. The User can post input and get output on the presentation layer only. In asp.net .aspx file is known as a presentation layer. In case of web applications, the web browser (Internet Explorer, Mozilla 2 Firefox) is known as presentation layer.[6]This layer has been built using technologies like HTML, JavaScript, AJAX, JSON and CSS in this proposed system.

2) Business Layer: Business Access Layer acts as a mediator Layer between Presentation layer and Data Access layer. This layer is used to transfer the data between Presentation Layer and Data Access Layer. This layer is mainly used for Validations and calculations purpose. It is optional layer if working on a small project. But if working on large projects, then include this layer in 3-Tier Architecture Applications. It is used to enhance the security and prevent brokering the application. The business logic is the code running on the server that contains processing instructions utilizing technologies such as .NET 4.5. The proposed payroll system uses .NET 4.5 in business layer to implement dynamic pages.

3) Data Access Layer: This Layer only communicates with Business Access Layer. Data Access Layer contains the method that helps Business Access Layer. Business layer class's methods call the Data Access Layer Class methods to perform some required action with database such as insertion, deletion, updating etc. All database related connection codes are written in this layer only such as SQL query, stored procedure etc. The data tier is containing all the user information, username, and passwords for web application.

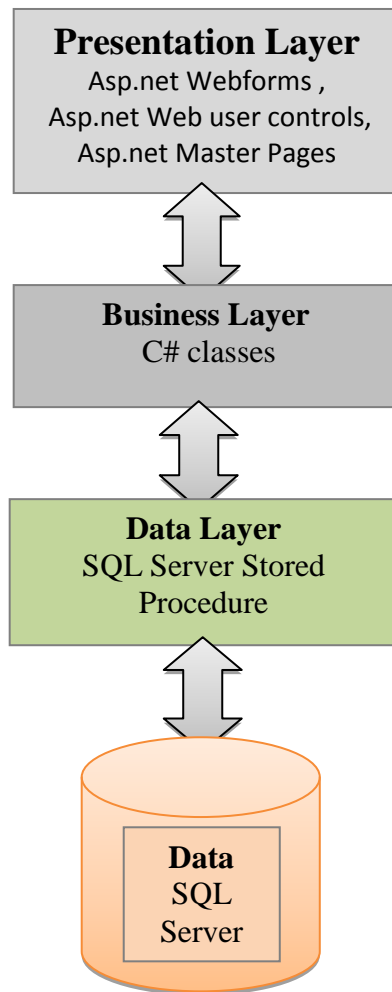


Fig 1: 3-tier architecture

B. Software Development Life Cycle for payroll system

Software Development Life Cycle (SDLC) is a framework that describes the activities performed at each stage of a software development project [7]. It starts with the system analysis, design, and implementation and continues through the maintenance and disposal of the system.

The steps given below describe implementation of proposed system:

1) System Analysis: Analysis involves a detailed study of the current clipper based system, leading to specifications of a new computer based payroll system. During analysis, data are collected on the available files, decision points and transactions handled by the present system. Interviews, on-site observations and questionnaire are the tools used for system analysis of present system. System Analysis also includes sub-dividing of complex process involving the entire system, identification of data store and manual processes.

2) Existing system: In order to maintain their design pay slips and other related information to project development, which include customer requirements, storage department is immense. The lack of consistency in pay slips maintenance leads to both loss of work as well as money and time. With the total automation of payroll Management System, the manual storage dependency is

minimized to a large extent. Present day organizations, especially large companies house employees in large numbers [8].

3) Proposed System: The proposed system is a web based system [9]. The base of the proposed system is a database, which stores all the information pertinent to personnel, allowances, deductions, taxes, savings and net pay. The payroll system will stay up to date with pay checks and tax filings [10]. This includes calculating allowances, taxes and other deductions, printing individual pay slips and deduction vouchers. The features of the system are-

- It maintains the payrolls as well as employee information.
- The system should also be easy to access, accurate and consistent results can be obtained in the form of documents whenever the user needs.
- It should inherit all the properties of high security, fast recovery, robustness, flexibility, reliability, scalability.

II. LITERATURE REVIEW

DESIGNING :

- A software is used for designing the product along with HTML, CSS and jquery.
- We are making a Responsive design for the application which can work on any platform according to the user's need.

DEVELOPING :

- Backend code is developed using C# and ASP.net.
- Database connectivity is from Enterprise Library and the database is SQL Server 2012.
- For data parsing, JSON and Ajax is used.
- Server is CLOUD SERVER but we don't have access to it. We have only local access.

A. .NET 4.5

.NET Framework 4.5 was released on 15 August 2012; a set of new or improved features were added into this version. The .NET Framework 4.5 is only supported on Windows Vista or later.

B. SQL Database 2012

SQL is a standard language for accessing databases. Microsoft SQL Server is a relational database management system developed by Microsoft whose primary function is to store and retrieve data as requested by other software applications. [15]

C. AJAX and JSON

AJAX is the technology by which we can create web sites using dynamic features and it also looks better and effective.[12] AJAX (Asynchronous JavaScript and XML) enables you to refresh part of a web page without having to send the entire page back to the server.[13]

JSON (Javascript Object Notation) is a text-based, human-readable data interchange format used for representing simple data structures and objects in Web browser-based code.[13]

III. PROPOSED SYSTEM

1. Login Page



Fig 2: Login page

2. Dashboard

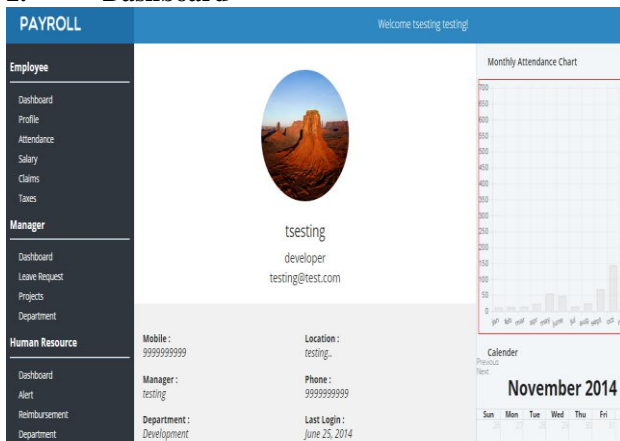


Fig 3: Dashboard

3. Profile



Fig 4: Profile

4. Attendance

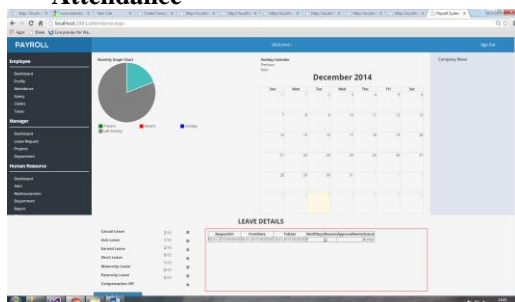


Fig 5: Attendance

IV. COMPARISON

TABLE I
DIFFERENCE BETWEEN MANUAL AND COMPUTERIZED
PAYROLL

Features	Manual Payroll	Computerized Payroll
Meaning	Manual payroll means that you, or another employee within your company, calculate the payroll each pay period entirely on paper.	Computerized system enables you to store unlimited data while managing the data as well.
Speed	Accounting software processes data and creates reports slower than the computerized system.	Accounting software processes data and creates reports much faster than manual systems.
Errors	Maximum errors as manual calculations are done.	Minimum errors as automatic or computerized calculations are done.
Efficiency	Less efficient as more time is required.	More efficient as less time is required.
Cost	Manual accounting with paper and pencil is much cheaper than a computerized system, which requires a machine and software.	Expenses associated with accounting software include training and program maintenance. Expenses can add up fast with costs for printers, paper, ink and other supplies.
Productivity	Productivity is usually lower, particularly in routine or operational situations such as transaction processing.	Productivity is higher than manual payroll as employees get their salary early as calculations are done on regular basis.
Processing of Data	Processing is slower as large volume of data need to be dealt.	Processing is faster as computerized system is there.
Bulk	Paper based systems are generally very bulky both to handle and to store, and office space is expensive.	No paper work is required as data is stored in the database. So, it is less bulky.

V. FLOWCHART

Flowchart is shown below in figure[17] :

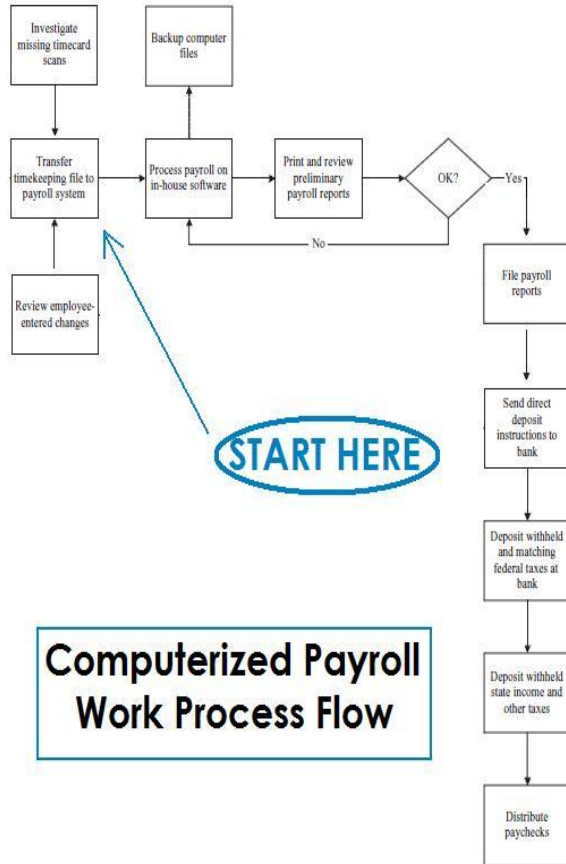


Fig 6: Flowchart

VI. CONCLUSION

The goal of this review paper was to a web based payroll system using .NET, Html, CSS, SQL, Ajax and JavaScript. This computer based Payroll system is accessible on the internet and calculates, maintains and records the payroll information of employees.

This Application will help to automate payroll system of an organization. Multiple authorized users will be able to login and logout from a web browser. Login checks (username, password) are controlled by administrator. Administrator will have total web based control to completely customize the payroll system. HR of the company will be able to authenticate new employees, update existing employees pay, view reports. The system is user friendly. Whenever there is an error in entering data, it immediately shows an error. The application is equipped with tools for updating salary records, tax calculation, add new allowances, leave appraisal or request deduction and savings and many other features that are easy to be operated by users. The system has also provision for full salary history including all payroll elements and changes that have been implemented. The prototype computer based payroll system is complete in itself and ready to be implemented but changes and growth in requirements will be a reality on every software project so there is need to timely update them. The same applies to this payroll system[1].

VII. Future Scope

There is always room for improvement, and the software we created can also be improved. This is especially because we had to create it within a limited time. With more time, the software can be improved to include security and different types of users. This would be the first step in making the software network-enabled, and eventually web-enabled. This was our original after-thought to programming the software, and we had chosen XML. In addition, the software can also be improved in terms of the calculations it can do, and more flexibility in the rates used in calculations per employee.[16]

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