

SOFTWARE REQUIREMENT SPECIFICATION

FOR

PAYROLL SYSTEM

Version 1

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Subject: Software Engineering

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1. Introduction

This document shows the Software requirement specification (SRS) for Payroll Management System (PMS) project. The software provides an easy way to assist and automate jobs that are done by Employee, Administration, and Human Resource.

The payroll application shows the timesheet, and generates paystubs based on the company's rule.

1.1 Purpose

This SRS for the Payroll Management system project document is intended as the blueprint of the project or guideline, so all the team has one understanding of one concrete idea of what they are doing. This will make the software integration much easier and reduce Implementation issues. The SRS is intended for the employer of the company (Customer).

1.2 Scope

The software is designed to provide an easy way to add employee data, update employee data, and remove employees. In addition, the software provides a full function report of salary and benefits of employees.

The software is called SHMoney, which is a payroll management system. This application works on many computers that share the same database. It can be used by users from different job positions, from different locations at the same time.

The benefit of this application is the improvement of efficiency, improved time to find information about an employee, provide easy and faster access to information, and it has a user-friendly interface. The objective is to provide an easy way to keep track of hours worked, and to calculate payments of employees. The goal is to increase productivity by having an automated system.

1.3 Definitions, acronyms, and abbreviations

- Contract:** A legally binding document agreed upon by the customer and supplier. This includes the technical and organizational requirements, cost, and schedule for a product. A contract may also contain informal but useful information such as the commitments or expectations of the parties involved.
- Customer:** The person, or persons, who pay for the product and usually (but not necessarily) decide the requirements. In the context of this recommended practice the customer and the supplier may be members of the same organization.
- Supplier:** The person, or persons, who produce a product for a customer. In the context of this recommended practice, the customer and the supplier may be members of the same organization.
- User:** The person, or persons, who operate or interact directly with the product. The user(s) and the customer(s) are often not the same person(s).
- Window Forms (WinForms):** It is a free open-source graphical (GUI) class library including as a part of Microsoft.NET
- Microsoft Access:** It's an information management tool, or relational database, that helps store information for reference, reporting and analysis
- Visual Studio:** It is an IDE made by Microsoft and used for different types of software development.
- PMS:** Project Management System
- C++:** a general-purpose programming language.
- SRS:** Software Requirements Specification
- GUI:** Graphical user Interface

1.4 References

Tsui, Frank, et al. *Essentials of Software Engineering*. Jones & Bartlett Learning, 2018.

1.5 Overview

The SRS contains step by step design and shows the functionality of the payroll system application.

SRS Contents

- Introduction
- Overall description
- Specific requirement of the application

2. Overall description

2.1 Product perspective

This application requires a computer system with an internet connection and a clear connection to the Database. Requires IDE, and a compiler for C++ and Microsoft access to store and retrieve data.

The software is developed to manage payroll. It is self-explanatory and user friendly. It works efficiently. It uses a simple database, effective for small business or startup companies. It has a good and easy GUI to be used by new or experienced users.

Software Interface

- Operation System: Windows, MAC
- Front End
- Back End

2.2 Product functions

Log in Menu: Users must Login by putting their user number, their password, and the position they have. Then press the button to go to their respective menu (Employee, Admin, or HR). All text boxes should be filled. and if there is an error in signing in an error window would pop up.

Admin Menu: User will be able to see his data and have the option to search for his employees and see their information, timesheet, and be able to notify HR if an employee is resigning.

Employee Menu: User, which is the employee, will be able to see an employment history, such as all personal information, benefits, paystubs, timesheets and other. The Employee has limited access, which he could only view but not edit.

HR Menu:

- **Add Employee:**

The add employee contains all the functions needed to add an employee to the database. The database contains all the necessary futures, such as Id employee, password, Name, address, and Health coverage type. In addition, the Add employee is connected to the database, any change that is the software is automatically reflected on the database.

- **Remove Employee:**

The remove employee removes an employee from the database. The function works by first calling on the database by filtering the employee using the ID. The ID- number is the primary key.

- **Update Employee:**

The Update employee updates the information of employees from the database. The function works by first calling on the database and using the employer ID, which is the primary key, to change the status of the employee.

2.3 User characteristics

-End User: No specific knowledge or skill is required. The User should have basic knowledge about computer operations.

-Administrator: Capable of managing users. If the network connection is not working properly, then the system wouldn't work as intended.

2.4 Constraints

Some constraints in developing the software are the computer language. It is exclusively done on C++. For a better software integration, the development team will code in Visual studio WinForms.

The code will be shared in GitHub. This limits the changes the team can do to the code without affecting other members' code. The constraint comes when the software is integrated into one. Limitation in knowledge of the use of WinForms as a graphical user interface and short time for deadlines. In addition, using the C++ as a software programming language, where it isn't

easily integratable to Microsoft Access.

Developers' computer capacity will make code compilation take more time. and debug will take longer.

2.5 Assumptions and dependencies

- The product has an interface which is simple enough to understand.
- The system will be designed, developed, and implemented based on the software requirements specifications.
- End users should have basic knowledge of computers. Users should have basic training documentation and reference material, such as a manual.
- The system will not be required to generate reports.

3. Specific requirements

3.1 External interface requirements

3.1.1 User interfaces

The first time a user uses this application, see Figure 1. he will see a Window with 2 text boxes to fill in and a scroll text box to choose between three positions. He/she will be able to log-in if they put a correct username, with password and choose his correct position. if login inputs were correct a small window pop up will confirm that he is log in. If he/she isn't in the system, they must communicate this with Human Resources.

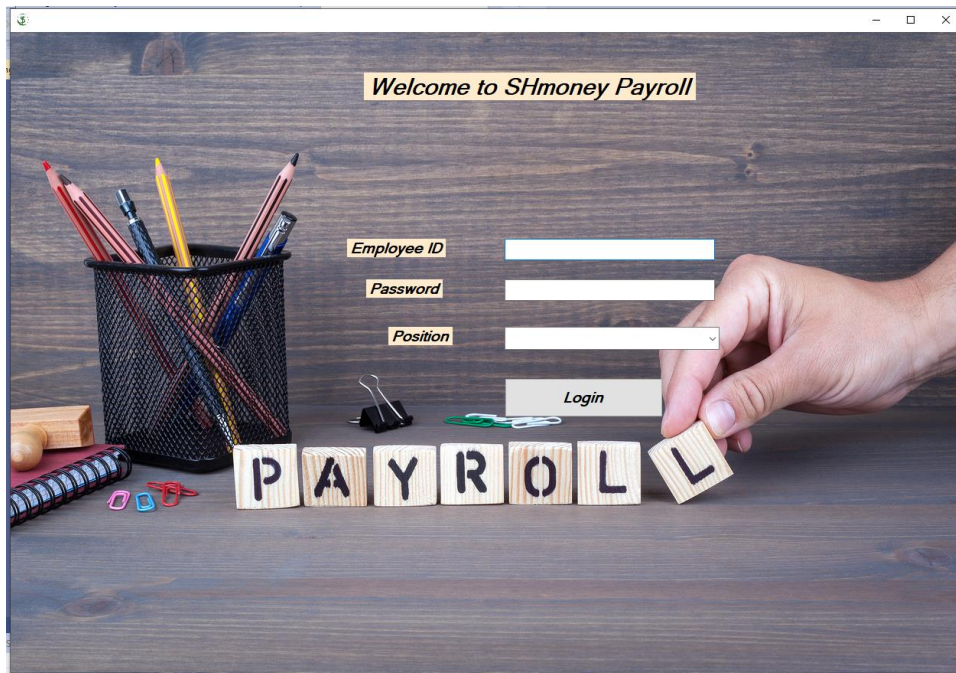


Figure 1 - Login Page

If Admin Log-in, he will see a window, see Figure 2. The Admin Main menu has three tabs, The first called "Admin Home Page", the admin will be able to see a welcome notice, and his information (ID, email, phone, and pay). There is a button to option if he wants to show his payment. Also, there will be three link labels. two of them give him the option to edit his email, and the other his phone. The third link label is the Logout. Where the Admin can Log out. The second Tab is called "Search Employees" which, also, has 2 tabs one is to search employees and see their information, and the other is to see the timesheet of the employee. The third tab is in development which will alert the admin if an employee is reclaiming some hours or other stuff.

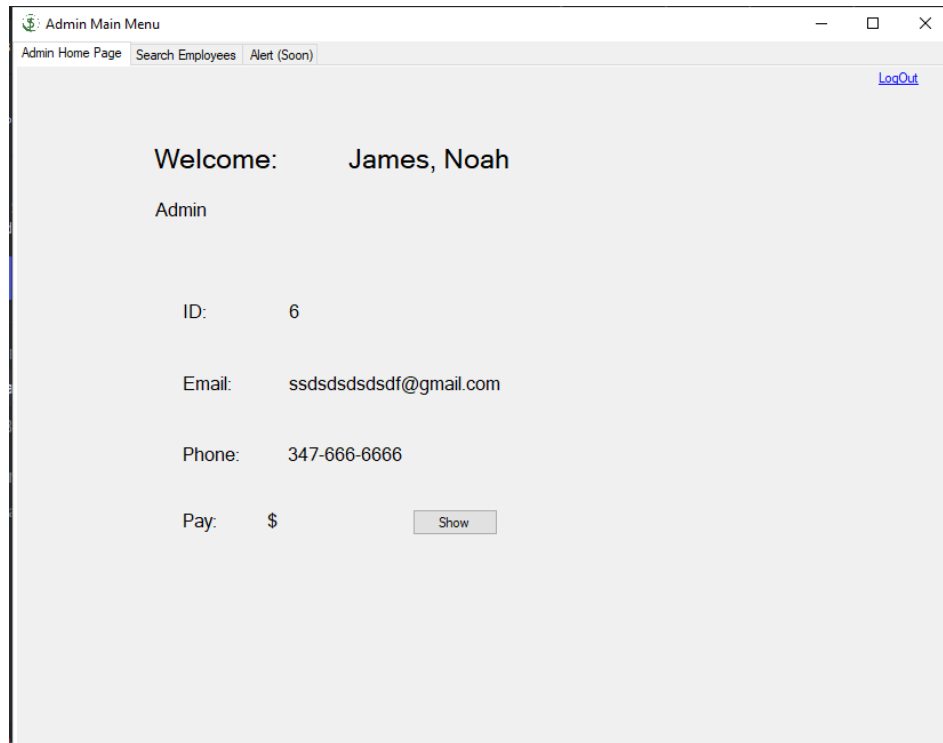


Figure 2 - Admin Main Menu

If an employee Log-in, the employer will see a window, figure 3. The Employee Main Menu has 6 tabs. The first one is called "Edit Personal Information". Where the employee may see his information and have the option to change his email and phone number by pressing the button "Submit changes". The second tab is called "view Benefits" where the employee can see his Benefits. The third tab is called "Information at a glance" where an employee can see his ID, Name, Department, and current benefit chosen. The fourth tab is called "View Pay Stub" where he can see his paystub and print it. The fifth tab is called "View Timesheet" and the last tab is logout.

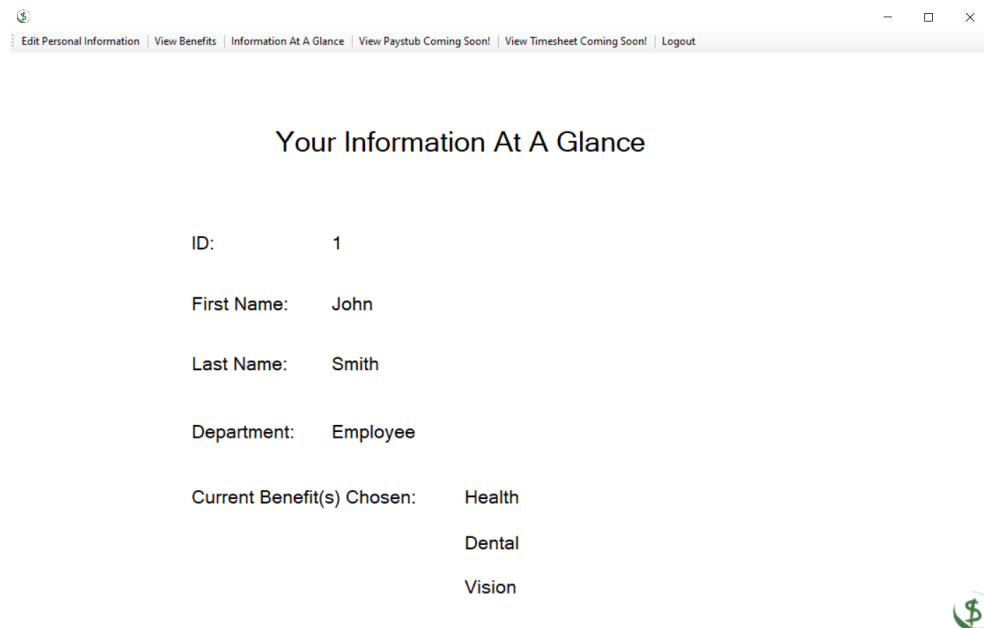


Figure 3 - Employee Main Menu

If a Human Resource employee Log-in, he will see a window, see figure 4. This window has 4 buttons, each of them makes another window open. The first one is "view Pay Stub" where an employee can see his own pay stub. The other three buttons are to add, update and delete employees, respectively.

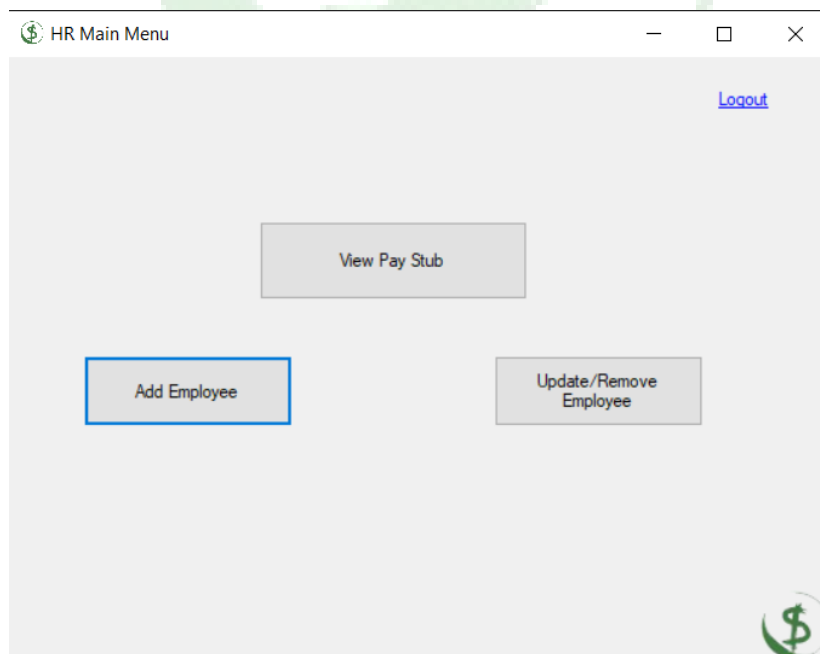


Figure 4 - HR Main Menu

The screenshot shows a window titled "AddEmployee" with a standard Windows title bar (minimize, maximize, close buttons). The window contains two columns of input fields. The left column includes: Employee ID (text box), Password (text box), SSN (text box), First Name (text box), Last Name (text box), DOB (calendar picker showing Sunday, November 14, 2021), Gender (text box), Age (text box), Position (text box), Hourly Wage (text box), and Hours (text box). The right column includes: Address (text box), Phone (text box), Email (text box), Zipcode (text box), Health Coverage (dropdown menu), Dental Coverage (dropdown menu), and Vision Coverage (dropdown menu). At the bottom center are two buttons: "Enter" and "Back". A green circular logo with a dollar sign is located in the bottom right corner of the window.

Figure 5 - Add Employee

The AddEmployee user interface is used to add the employee information. Based on the figure shown, the addEmployee contains, information such as EmployerID, Password, SSN - Social Security number [xxx-xx-xxxx], First Name, Last Name, DOB, Gender, Age, Position [HR/Employee/Admin], Hourly Wage, Hours, Address, Phone, Email, Zip Code, Heath Coverage, Dental Coverage, and Vision Coverage. In addition, the Addemployee interface contains two buttons, which are "Enter" and "Back", The button "Enter" helps the user to add the employee to the company database and "Back" to go back to the previous interface, which is the HR view.

Figure 6- UpdateEmployee

The update user interface is used to update Change and Delete records from the companies database information. Based on the figure shown the updateEmployee contains, information such as EmployerID, First Name, Last Name, DOB, Gender, Email, Phone # [xxx-xxx-xxxx], Address, Zip Code, Age, Position, Hours, Hourly age, password, Health Coverage, Dental Coverage, and Vision Coverage. In addition, it contains 4 buttons, such as retrieve info, Update changes, Delete record, and back. The “retrieve info” button pressed retrieves the employee information from the company's database and prints. The “update change” button pressed updates the employee's information from the company's database. The “delete Record” button deletes a single employee from the company's database. The “Back” button is used to go back to the HR view.

3.1.2 Software interfaces

Visual Studio community 2019 is being used for developing the Payroll Management system, which has an app-based interface. And a relationship with a Microsoft Access database system, in which data is stored.

Development requirement [Frontend and Backend]

Visual Studio community 2019:

Visual Studio community 2019 version 16.11.16 is an integrated development environment (IDE) used to design the payroll management system. The IDE contains different programming languages and plug-ins [individual components]. The software is designed using “Desktop development with C++”, which contains C++ programming language. And, the individual component, which is C++/CLI support for v142 build tool, is used in creating the GUI by providing the toolbox.

Microsoft 365 Access 2007-2016:

The default file format for the database is Microsoft 365 Access 2007-2016. It is version 2110 (build 1452.20234). Microsoft Access is used as a platform to store and retrieve data on the different computers that use the same data tables. The access database is designed to hold customers ranging from small applications to a huge number of customers at the same time.

3.1.3 Communications interfaces

The system uses Microsoft Data access as a Database, to store, retrieve or update information.

3.2 Classes/object

3.2.1 AddEmployee class

3.2.1.1 Attributes

It is a windows form which will show after the add employee button is pressed in the HR menu. It has many text boxes to be filled and 2 buttons one is to enter the information and the other to hide this WinForms and show the previous one.

3.2.1.2 Functions

This class adds new employees into the database when all text boxes are filled with the correct data type. The information stored in the database is Id, Password, Social Security Number, First Name, Last Name, Date of Birth, Gender, Age, Position, Hourly wage, Hours, Address, phone number, email, Zip code, and benefits (health coverage, dental, and vision).

3.2.1.3 Messages

Send information to the database, receive confirmation when done correctly. When there is an error, a pop-up window is shown to alert of the error.

3.2.2 AdminMenu

3.2.2.1 Attributes

It is a WinForms which will show after an Admin Log-in to the system. It has three tabs. The first tab will show a welcome message with the admin name, ID, email, Phone and Pay. There is a button to decide to show or not show the pay. There are two link labels that let the user edit their email and phone.

The second tab has two tabs. The first one has a button and a text box. When pressed and correctly filled the information of the employee will show in text messages. there is another button to hide all previous labels shown. The second one shows information about the timesheet. what he made this week and the previous week.

The third tab will be completed by December 2021

3.2.2.2 Functions

This class is made for the Admin User, where he can see his information, and edit his email and phone number. it is also to search and see his employee's basic information. The admin can see his current and previous hours. The third tab that is not in work will alert the admin if some of his employees have a claim for hours or other necessities.

3.2.2.3 Messages

Send updates on the phone, and email. receive confirmation. It also sends ID number to be search in the database, and will receive information of the employee

3.2.3 Benefits

3.2.3.1 Attributes

This class has 3 attributes. Each attribute describes the health benefits the employees can choose from. The health coverage, dental coverage, and vision coverage are some of the benefits that are included. Other attributes that are included are the Premium, gold, and silver packet which are included in each health/dental/vision as subsets.

3.2.3.2 Functions

It has 4 member functions. They calculate the health coverage, Dental coverage, vision coverage and what is the cost of health benefits. From each attribute, the employer could choose their individual coverage based on the salaries. If the salary of the employee is less than 70,000 could choose a silver packet for health, dental and vision. If the salary is between 70,000 and 100,000 the employer could choose between a gold packet. At the end, if the salary is greater than \$100,000 the employer could choose a premium packet.

As an employer the deductibles are 30% and the out pocket are 20%, and it varies based on different insurance companies. Each deductible and out packet varies based on the attributes.

3.2.4 Check ID

3.2.4.1 Functions

This header file has three functions. toStdString converts a `System::String ^` to a standard `std::string`. `isNumber` returns a `bool` based on whether the input string is a number or not. `checkID` uses both functions to verify that the string sent as a parameter is a

number, then connects with our database to check whether the ID value from the string exists within it.

3.2.5 ConnectionPath

3.2.5.1 Functions

This class has one member function which has a String with the path to connect to the database. This class is used to use this path in the different classes that will need the database connection.

3.2.6 EmployeeMainMenu

3.2.6.1 Attributes

It is a WinForms that will show after an Employee user Log-in. It has 6 tabs. The first tab will display the information of the Employee (ID, Name, DOB, Sex, Department, Job title, Income Type, pay rate, gross income). and has text boxes to change or edit the email and phone number, and a button to confirm these changes.

The second tab is to see the benefits the employee has. This will display the Benefit the employee chooses. The third tab will display information about the employee (ID, first name, last name, Department and Benefit).

The fourth and fifth tab will be completed in December 2021.

The last tab is to log out of the system as an employee and return to the main menu.

3.2.6.2 Functions

This class is made for the Employee user. He can see his Information, and edit their data like phone number, and email.

3.2.7 FedTax

3.2.7.1 Functions

This class has 1 member function. This function will calculate the

federal tax rate, depending on how much the employee earns.

3.2.8 GrossIncome

3.2.8.1 Functions

This class has 3 member functions. The first one is used to calculate overtime hours. This will reduce 40 hours to the actual hours of the employee if it has more than 40 hours of working time. The second is to calculate overtime pay. This will multiply his regular pay and the overtime hours calculated before by 1.5. The last function is to calculate the gross Income by multiplying regular hours by regular pays and adding the overtime pay. This Class will be used to calculate the gross income of the employee.

3.2.9 HrView

3.2.9.1 Attributes

It is a WinForms that will show after an HR user log-in into the system. This has 4 buttons and a logout link. The first button will send the user to another window to see paystubs of employees. The other 3 buttons will hide the current window and open others. The Logout link will sign out and send it to the main menu.

3.2.9.2 Functions

The user can see paystub from the employees or himself. It can also have the option to add, update, or delete employees. The user can log-out from this window and go to the main menu.

3.2.10 ViewPaystub

3.2.10.1 Attributes

It is a WinForms. It has a layout of a printable pay stub. It has All information necessary to be known by the employee when she/he received their payment. It has labels that will change depending on the input information on the Employee ID textbox, and by pressing the

Retrieve info button. This class has another button to go back to the previous window (HR main menu)

3.2.10.2 Functions

The Function of this class is to make a printable pay stub for each employee.

3.2.10.3 Messages

When sending information by pressing the button, retrieve info. If correct it will show all necessary information of the employee to the pay stub. If it is empty or has an incorrect entry it will show a pop-up window notifying an incorrect input or to announce that the textbox is empty.

3.2.11 LoginMenu

3.2.11.1 Attributes

It is a WinForms. It is the first the user sees when the system starts. This has a welcome message. It has 3 text boxes to be filled with Employee ID, password, and position, so the user may login. There is also a Login button that when the user put the required information it will send him to his correspondent window (Employee, HR, or Admin)

3.2.11.2 Functions

This class is made so the user can log in into the system and use the many options this payroll system has to offer.

3.2.11.3 Messages

Send Employee ID, password, and Position. If correct, the user will receive a login confirmation. If it is not correct it will receive a message with an error message. The user must fill the three text boxes, or the user will receive a message saying to fill everything.

3.2.12 NYTax

3.2.12.1 Functions

This class has 1 member function. This function will calculate the New York tax rate, depending on how much the employee earns.

3.2.13 TimeSheet

The class will be completed in December 2021.

3.2.14 UpdateEmployee

3.2.14.1 Attributes

It is a WinForms which will show after the Update employee button is pressed in the HR menu. It has a text box that will receive an ID number and a button that when pressed with a correct ID, will show the basic information (Name, DOB, and gender). Also, there are more text boxes to be filled with new data to be updated. There are three buttons, one to confirm the update, the other one to delete the record of the employee and the last one to go back to the HR menu.

3.2.14.2 Functions

This class updates employee information in the database. The Employee ID text Box should be filled before updating. When the information of the employee is retrieved, The HR user can change the text boxes, and update the Data. Also, they have the option to delete the employee with the Delete Record button, or to go back to the previous menu (HR main menu).

3.2.14.3 Messages

When sending information by pressing the Retrieve Info button, the user will receive all the information of the employee that he was searching for or receive an error message such as incorrect ID number, or an incomplete textbox.

When sending information with the Update Changes, the user will

receive a pop-up window with a confirmation message. If there is an empty space it will say incomplete text box or if there is an error in the type of input. it will say error in input type.

3.3 Performance requirements

Most of the transactions should be completed in less than 1 second. Sometimes it will take more time because of problems with the connection with Microsoft Access.

3.4 Design constraints

Some constraints in developing the software are the computer language. It is exclusively done on Visual Studio Windows Form in C++ (GUI and platform). The constraint comes when the software is integrated into one. Limitation in knowledge of the use of WinForms as a graphical user interface and short time for deadlines. In addition, using the C++ as a software programming language, where it isn't easily integratable to Microsoft Access.

3.5 Software system attributes

Reliability: HS Money has a reliable Payroll System. Require low training for users to start using it and enjoy their various benefits such as quick payment calculation. View all your information and benefits with not complicated formats.

Availability: HS Money Payroll System is available for its customer 24 hours in the day. It is useful for small or startup companies.

Security: It is not yet incorporated in the system. but it will be password enabled. Now the system is separated in the hierarchy of users, where the HR is at the head and has all the privileges to see the employees while the employees are at the bottom and only see their information and change some of it.

Maintainability: Iterative development and regular views from programmers

helps to improve quality and maintain the software. In addition, increase planned maintenance both in the payroll application and the database.

Portability: It is portable as it uses portable programming language such as C++. C++ can be easily compiled in different cross platforms and environments.



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