2022

Payroll Management System

WAJAHAT QAZI

Anzal Aon Abbas

Table of Contents

Chapter 1

Abstract:

"Payroll Management System" is designed to make the existing manual system automatic with the help of computerized equipment and full-edged computer software, fulfilling their requirements, so that their valuable data and information can be stored for a longer period with easy access and manipulation of the same. The required software is easily available and easy to work with. This application can maintain and view computerized records without getting redundant entries. The project describes how to manage user data for good performance and provide better services for the client.

Introduction

This chapter provides an introduction to the project, motivation and criteria to achieve the objectives.

1.2. Project Outline

The task is to build a salary management system. Current salary system is manual therefore the organization wants to switch to an automated computerized salary management system. After building this system we have to integrate it with the existing computerized system. The existing system is dealing with the client registrations, keeping records of clients, client billing etc. Hence we can say, employee salary system will be a subpart of the existing computerized system. Employee salary management system is enabling the organization to handle salaries of employees. The managers or team leaders of this organization are able to fill out all necessary information of an employee, i.e., residential address, contact information, designation details, salary and other relevant information. This system should be capable enough to calculate the salaries of employees.By the end of each month. Upon request, the employees can receive their salary slips through email. Moreover, the system should be able to calculate tax deductions of every employee.

1.2. Motivation

All calculations such as employee salary, employee tax, organization tax calculations etc. are being done manually at the moment which is a time-consuming task. Hence, a system is required that can perform all above said operations automatically. Moreover, the system should be user friendly, flexible, fast and highly secure.

1.3. Problem Identification:

The organization is using a manual system to calculate salaries and tax of employees. They also have to calculate and keep record of tax of whole organization and maintain tax files manually. All this work requires a lot of paper work, is extremely time-consuming job, and accordingly costly as well, as they have to hire more man power. Since there is always a risk of human errors present in a manual system so the chances of errors are very high and to figure out such errors is also a very lengthy procedure. Therefore, the organization decided to switch from a manual system to an automated computerized salary management system. The requirement of the organization is to develop an application that is able to deal with salary and tax calculation of employees within the organization and maintain its data base. Furthermore, this system should be able to generate automatic files such as, salary slips, bank files and tax files in response of queries from the data stored in the database.

1.5 Project Goals

The system should be capable of performing following functions:

- Store basic information regarding employees of the organization.
- Store salary information of employees (entered by the Human Resource Manager) such as, Basic Salary, Fuel, salary before tax, tax percentage, total amount of tax paid, salary after tax, social security fee, on monthly basis.
- System should be able to generate the following salary information:

    1. Tax Calculation
    2. Social-Security Calculation
    3. Insurance Calculation
    4. Net Salary Calculation

- Social security fee depends upon employee basic salary. Hence, percentage on the salaries would be variable.
- Salary slips can be sent to the employees upon request.

1.6. Goals Criteria

The criteria to achieve the goals of our project is as following:

- To generate bank file/invoice System should be able to generate a bank file and salaries should be delivered to employee accounts.
- Performance and efficiency the system should perform according to the requirements and provide appropriate and accurate results.

Chapter 2

Comparison:

In this chapter we will compare a system of our own choice with different salary calculation software available in the market. On the basis of this comparison, we will describe the motivation of developing customized solution

2.1 Why Customized Solution:

There are a variety of software tools available in the market that are able to calculate the salaries of employees. Now the question arises, why is it required to build a customized software?

2.1.2 Analysis of Different Salary Calculators:

Salary Calculation Software:

This software is able to do calculations of employee salaries on the basis of data provided by the work tracking system. It is basically a combination of two systems, i.e., “work management software” and “Salary calculations”. Second one is totally depending on the first one by taking data as input from work management software and calculating the salary on the basis of this data. The software has the following features:

- “Planning Project”
- “Keeping track of working results and helping managers to define work results”
- “Helps to Calculate salary from work results”

Analysis of Salary Calculation Software:

- This software is facilitating work management and task scheduling more than the salary calculation. Salary calculation is one of its secondary feature, whereas work management is its primary feature.
- This software is not providing any feature to calculate taxes and social securities.
- This software is unable to generate pay/salary slips and bank/invoice slips.
- The company has to purchase the license per user to use this software.
- This software is not providing any interfaces or plug-ins that can be used to merge it with the existing system working with-in the organization.
- As with the growth of company, it may require to enhance the system or if company needs any amendments in the system, it would be very hard to achieve such goals as the purchased softwares are delivered always in. Exe form.

2.2. Employee Salary Management System:

The System we are going to develop is according to the user requirements which will perform salary calculation as well as tax calculation. Moreover, the system will be user friendly and flexible enough to be enhanced according to the needs of the users in future.

Chapter 03

Requirement Analysis

In this chapter, we are going to discuss the requirements, design of the system and analyze them using some appropriate software models.

3.1. System Requirements:

Requirement analysis is an important phase of the system development cycle which provides us all the specification of system in detail which are very essential to build the system and also provides us knowledge about the behavior of the system. Collection of system requirements is a very critical point because the whole system is based on this knowledge and it also provides input to the next following stages of the system development life cycle. We can classify the requirements of the system in two categories as following:

- Functional Requirements
- Non Functional Requirements

3.1.1 Functional Requirements:

Functional Requirements specifically defines functionalities of the system, behavior of the system and the goals to achieve it. Functions that describe the behavior of the system are considered as behavior requirements and will be shown in the form of use cases. The importance and description of functional requirements are explained in the following table:

ID NO.	FR	Importance	Description
1	Security	Essential	User authentication is required.
2	Web Interface	Essential	Provides interaction between user and database.
3	Database	Essential	Stores the calculated taxes and salaries.
4	File System	Essential	Stores bank files and tax files.
5	Search	Required	To search out tax files, salary slip and bank files.

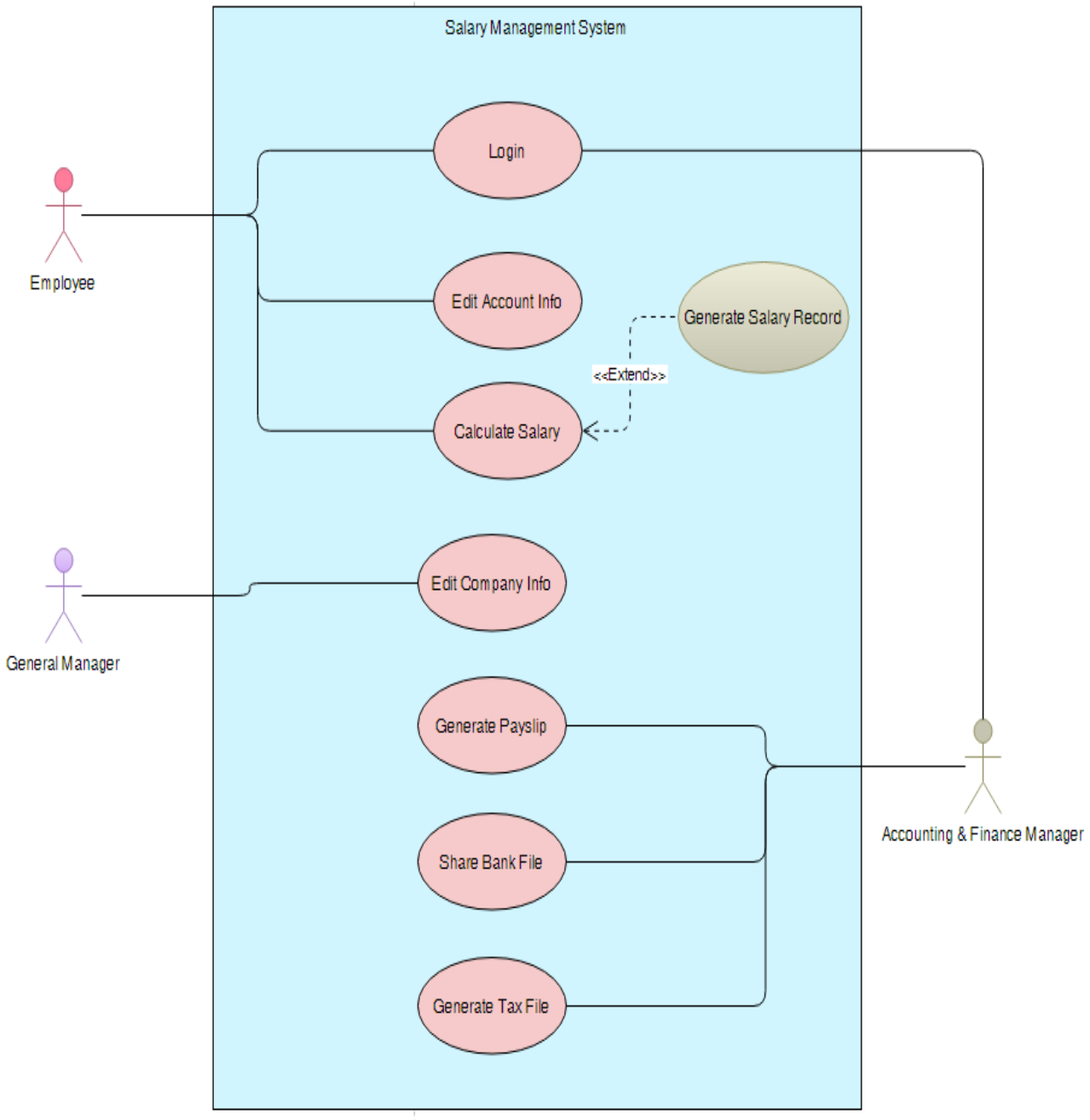
3.1.2 Non-functional Requirements:

Non-functional requirements are also known as quality attributes of a system. Hence, it provides us knowledge regarding the operations instead of behavior or functionalities, contradicting with the FR in this manner. Non-FR are described in the system architecture helping us to achieve the quality goals and improves the functionalities of the system. Non-functional requirements are as following:

ID NO.	Non FR	Importance	Description
1	Performance	Essential	Performance of system should be adequate and fast.
2	User Friendly Environment	Essential	System interface should be simple and user friendly.
3	Application Maintenance	Essential	Maintenance and documentation should be done throughly.
4	Paging	Essential	System should be capable of splitting large amount of data using data paging to present information in a user friendly way.
5	Application Scalability	Required	System should be flexible and expendable for future use.
6	Platform Independence	Required	System should be capable to work in any environment.

3.2 System Use case:

In this section we will discuss the use case of payroll management system. Uses cases show how the users interact with the system. There are three actors in our system, employee, general manager and accounting & finance manager. Each one has its own responsibilities and level of access to the system.



3.3 Descriptive Use Case:

In this section we will discuss the descriptive use case of payroll management system. Descriptive Uses cases show how the users interact with the system in descriptive form with all previous actors.

- **Login:**

Use-Case ID	SMS/21/001
Description	Employee wants to Login to the system.
Actors	Employee
Pre-Condition	Employee should have an account
Main Source Path (Primary Flow)	
Actor Actions	**System Response**
1. Open Application 3. Provide Username & Password	2. Display User Interface of Application 4. Verify Username & Password 5. Login User to the System. 6. Display Contents of the Account.
Alternative Path	
3.1. Wrong Username or Password.	
Post-Condition	Employee successfully logged in to the system

- **Edit Account Info:**

Use-Case ID	SMS/21/002
Description	Employee wants to edit his account information.
Actors	Employee
Pre-Condition	Employee Should have an Account
Main Source Path (Primary Flow)	
Actor Actions	**System Response**
1. Open Application 3. Provide Username & Password 7. Tap **"Edit Account info"**. 9. Edit the desired Information.	2. Display User Interface of Application 4. Verify Username & Password 5. Login User to the System. 6. Display Contents of the Account. 8. Display Account info edit environment. 10. Validate the edition. 11. Update Employee Account information.
Alternative Path	
3.1. Employee enters Wrong Username or Password. 10.1. Employee makes an Invalid Edition.	
Post-Condition	Employee Information Updated.

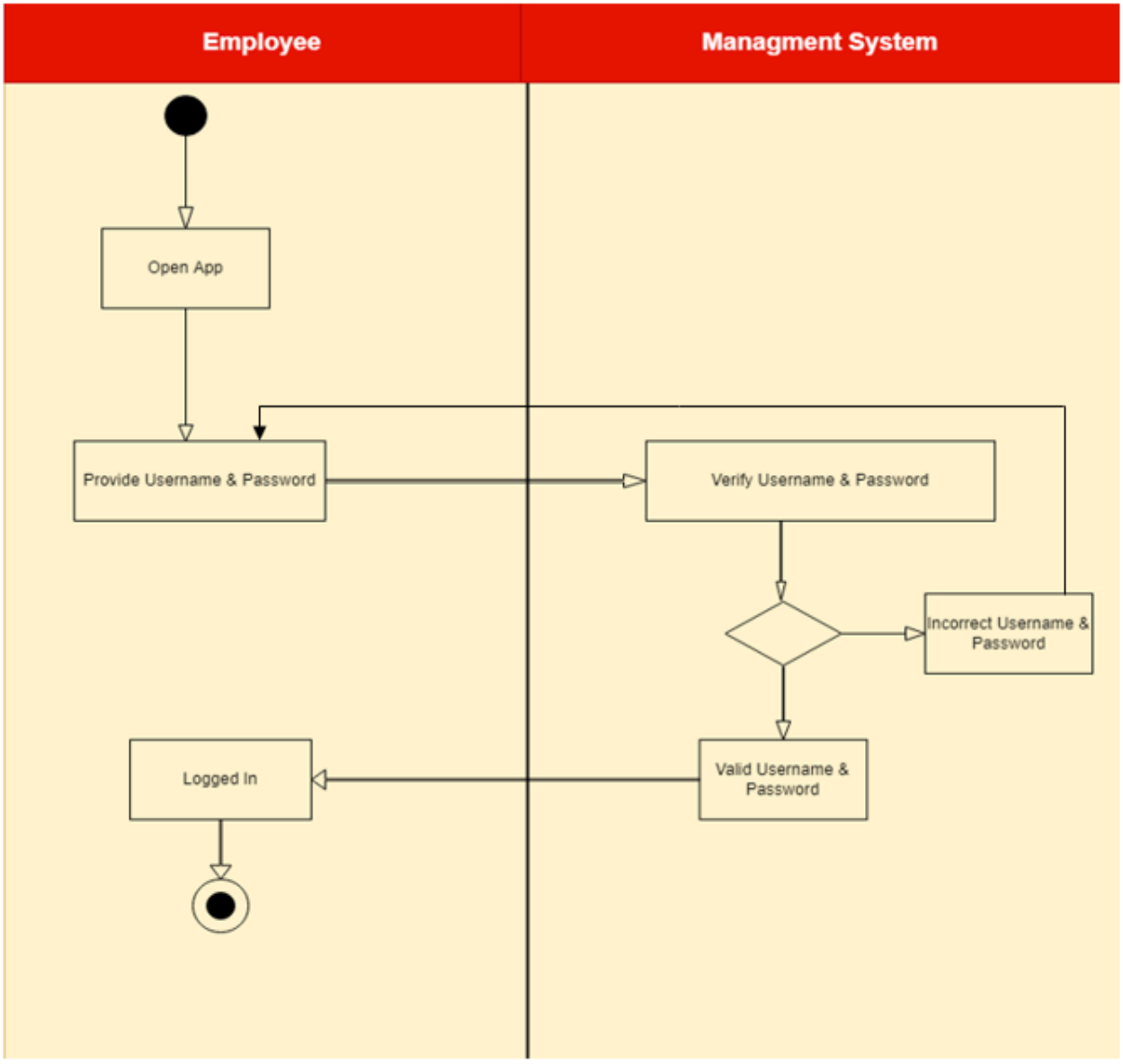
- **Calculate Salary:**

Use-Case ID	SMS/21/003
Description	Employee wants to Perform Salary Calculation.
Actors	Employee
Pre-Condition	Employee Should be logged in to the system.
Main Source Path (Primary Flow)	
Actor Actions	**System Response**
1. Tap **"Calculate Salary".** 3. Enter E_ID. 5. Enter salary per month, of tax and of social security.	2. Display Salary Calculator 4. A procedure calls in response and gathers the required information about the user from the database, adding it to the salary calculator. 6. Calculate tax and social security and deduct it from monthly salary. 7. Display Salary
Alternative Path	
3.1. Employee enters wrong E_ID. 5.1. Employee enters negative values.	
Post-Condition	Employee has calculated his salary.

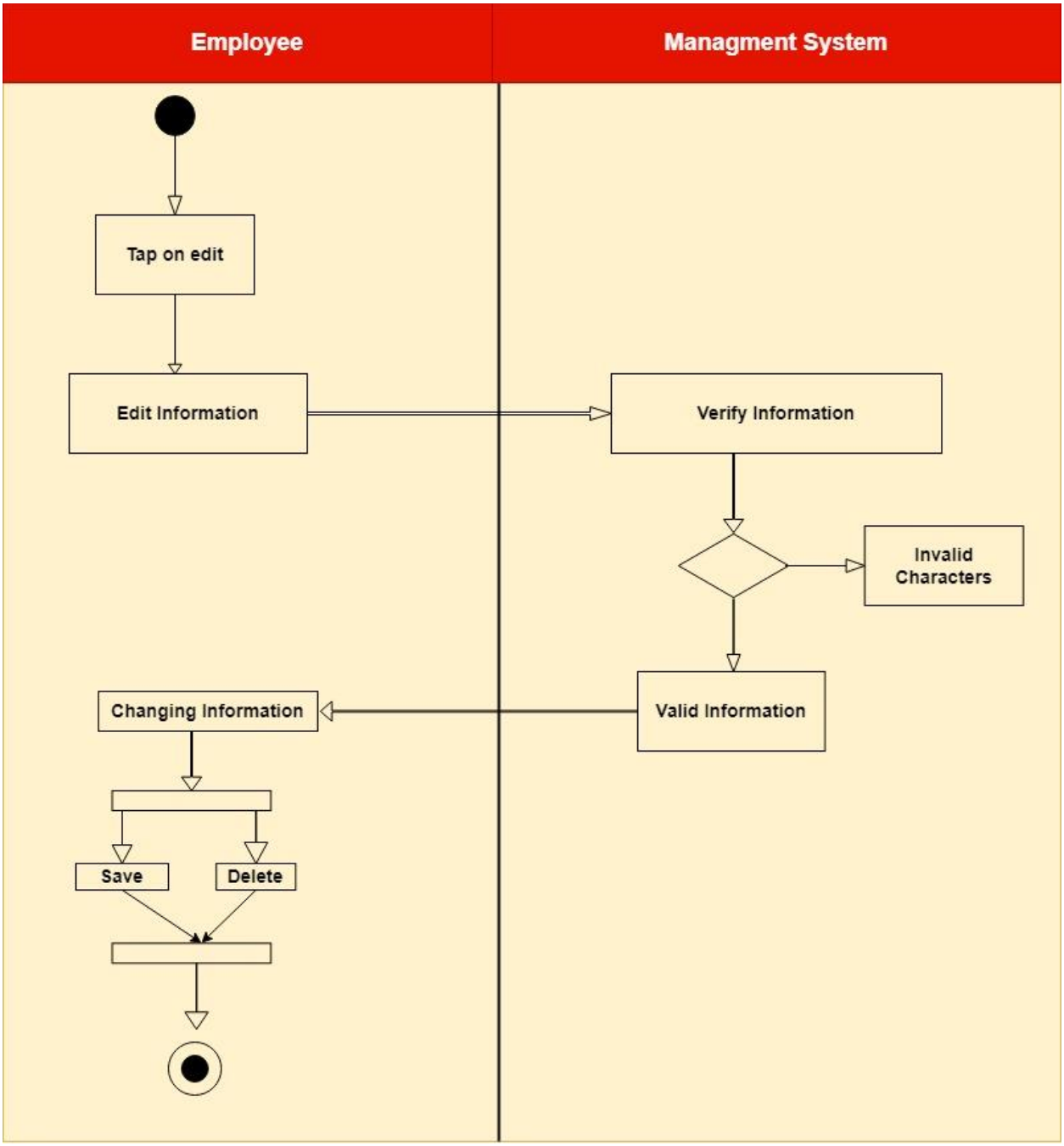
3.4 Activity Diagram:

In this section we will discuss the activity diagram generated from pre designed use case of payroll management system. Activity Diagram elaborates how are use cases carried out in a flow.

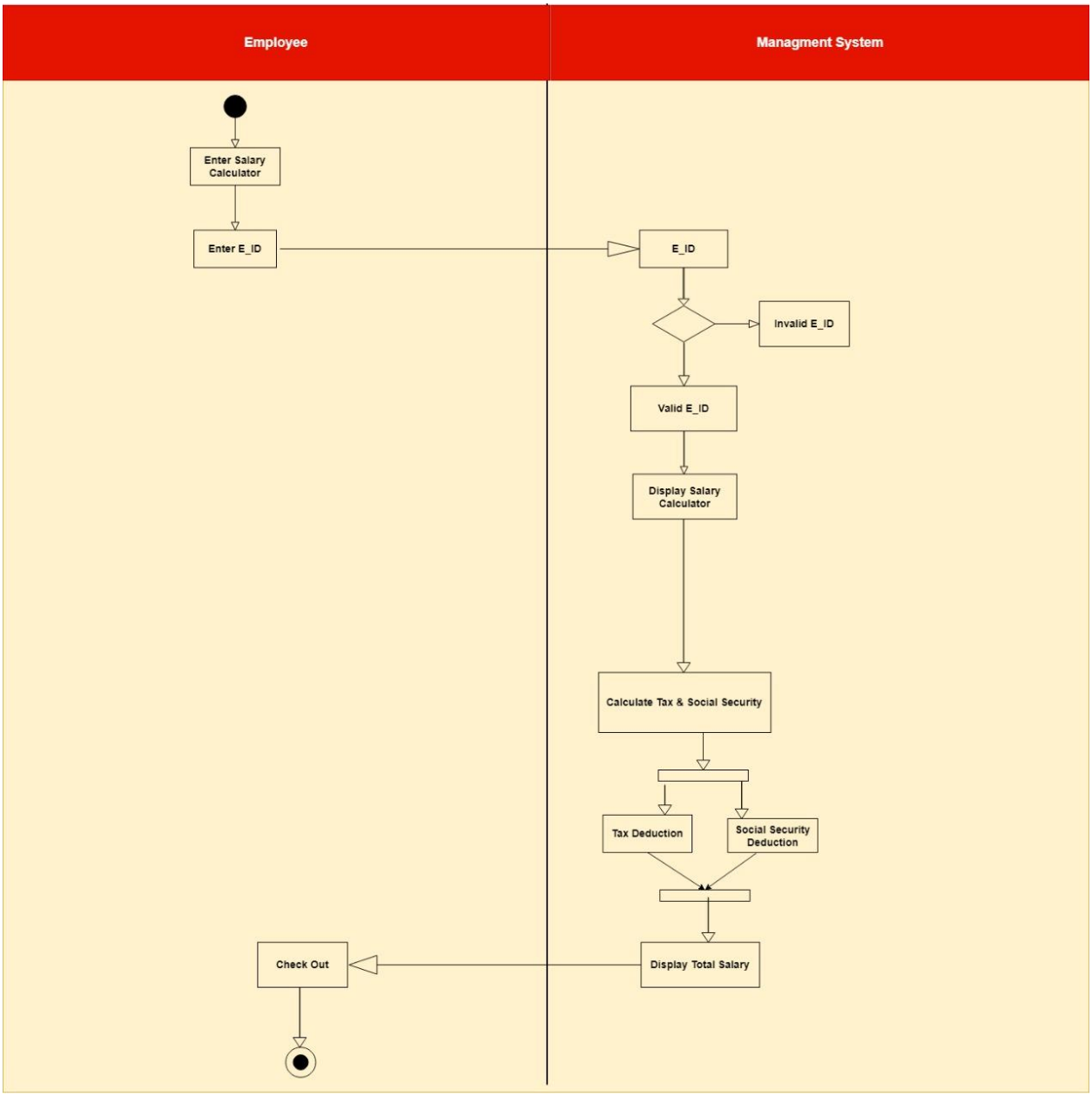
- **Login:**



- **Edit Account Info:**



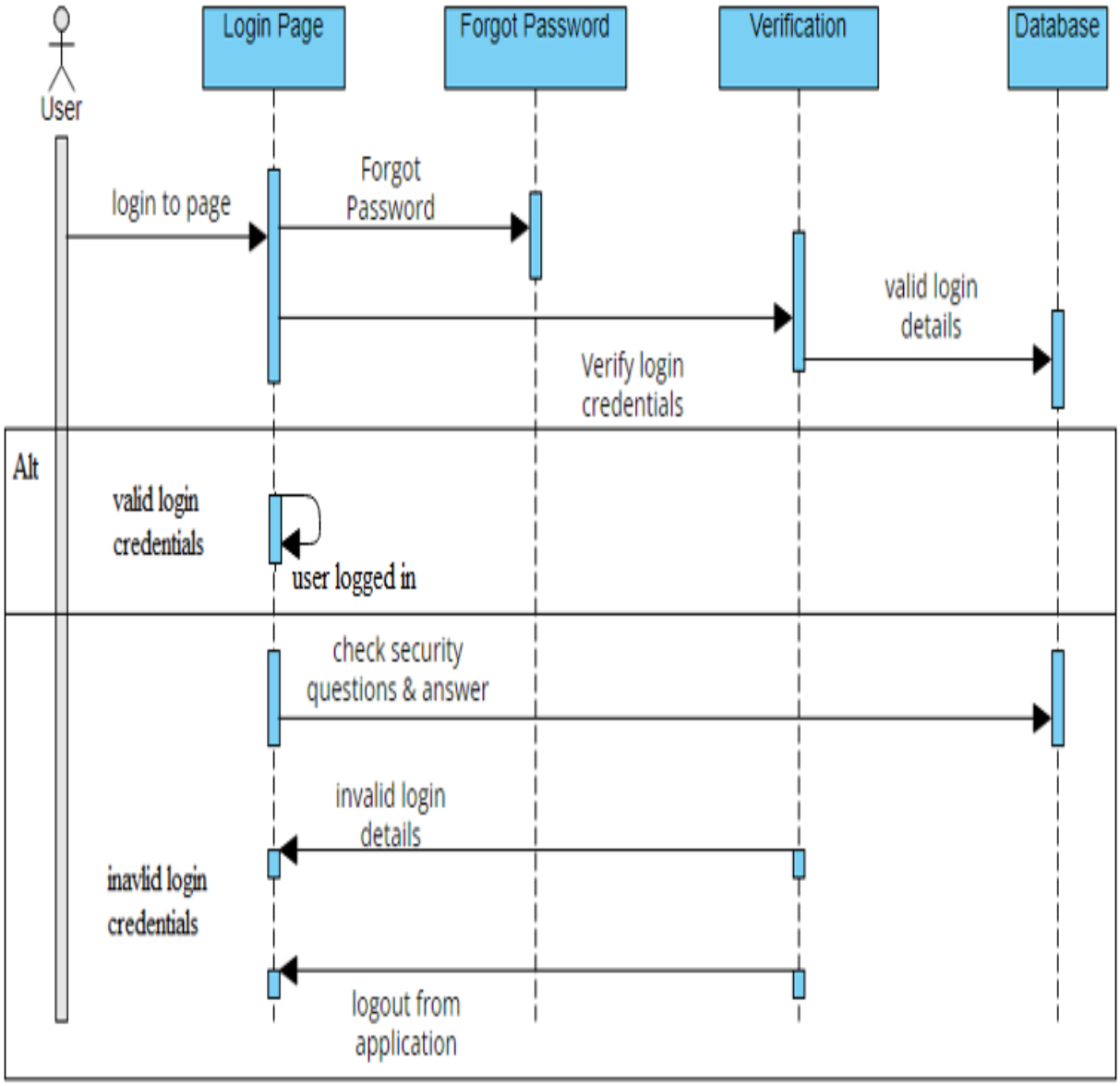
- **Calculate Salary:**



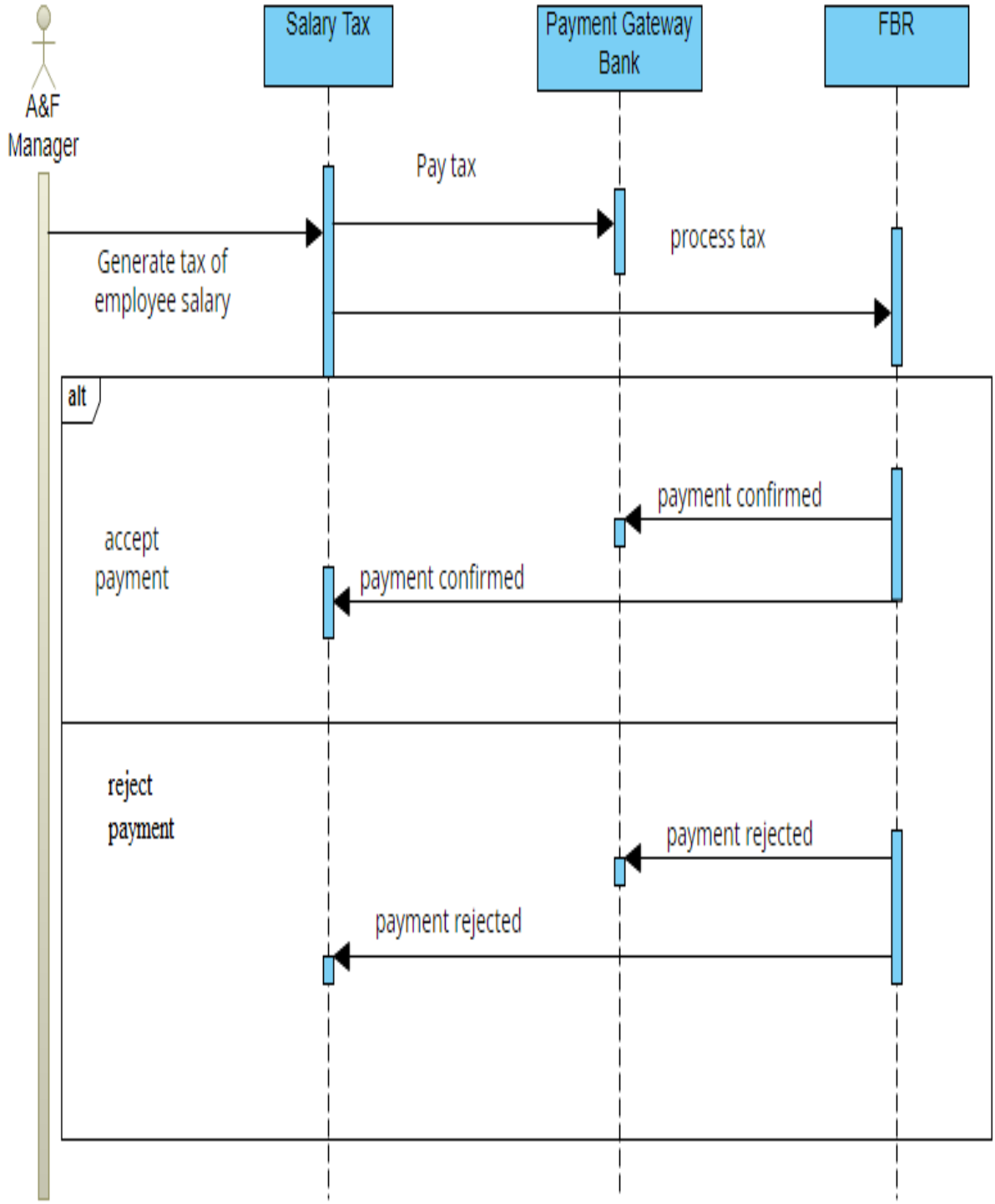
3.5 Sequence Diagram:

In this section we will discuss the sequence diagram generated from pre designed activity diagram of payroll management system. Sequence Diagram visualizes how each activity is performed in core.

- **Login:**

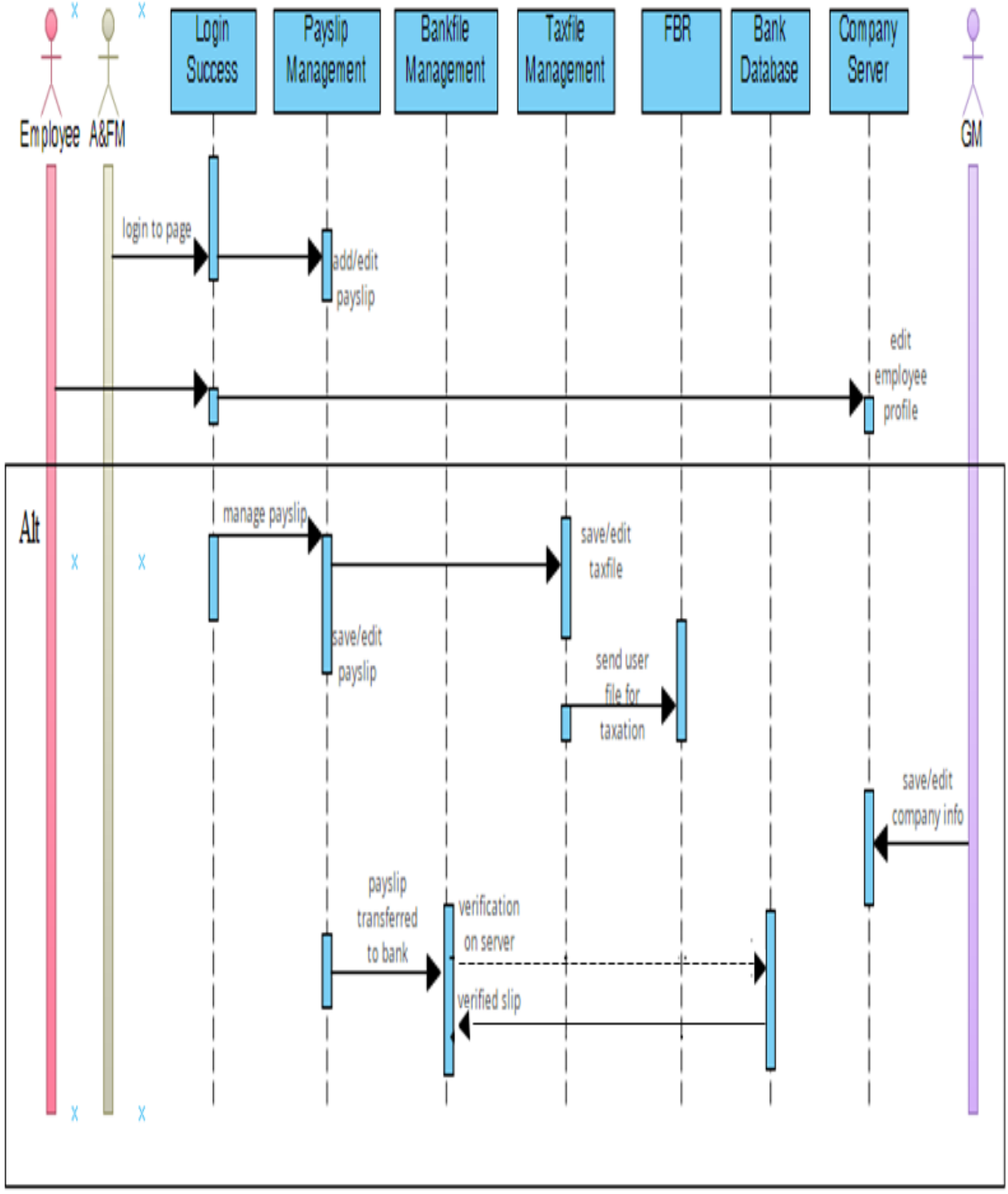


- **Tax Deposition:**



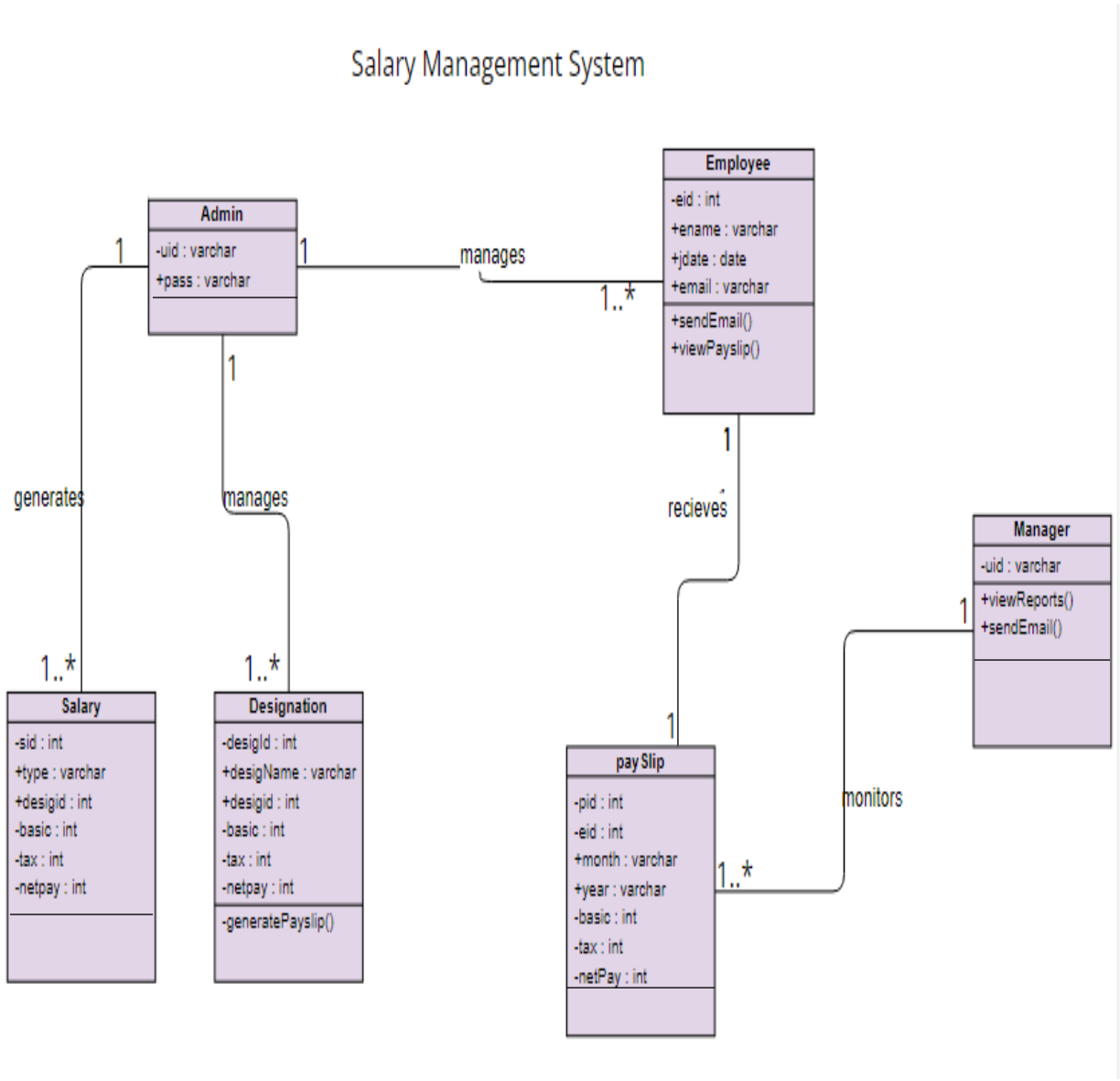
3.6 System Sequence Diagram:

In this section we will discuss the system sequence diagram which explains the sequence of overall system.



3.7 Class Diagram:

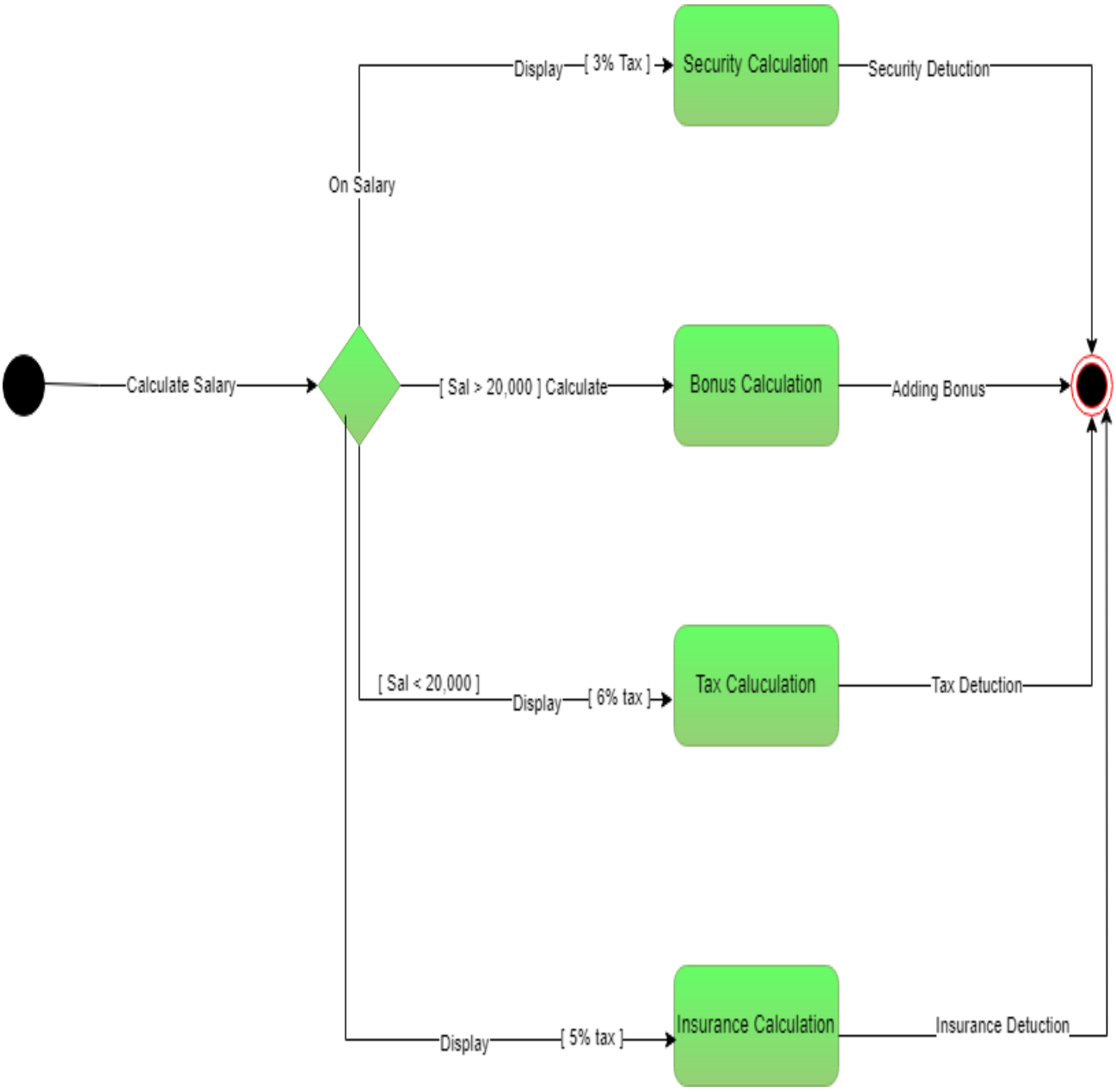
In this section we will discuss class diagram for system. Class diagram overall divides system into multiple classes dependent upon properties they possess. Furthermore, it also assists to implement classes in program.



3.8 State Machine Diagram:

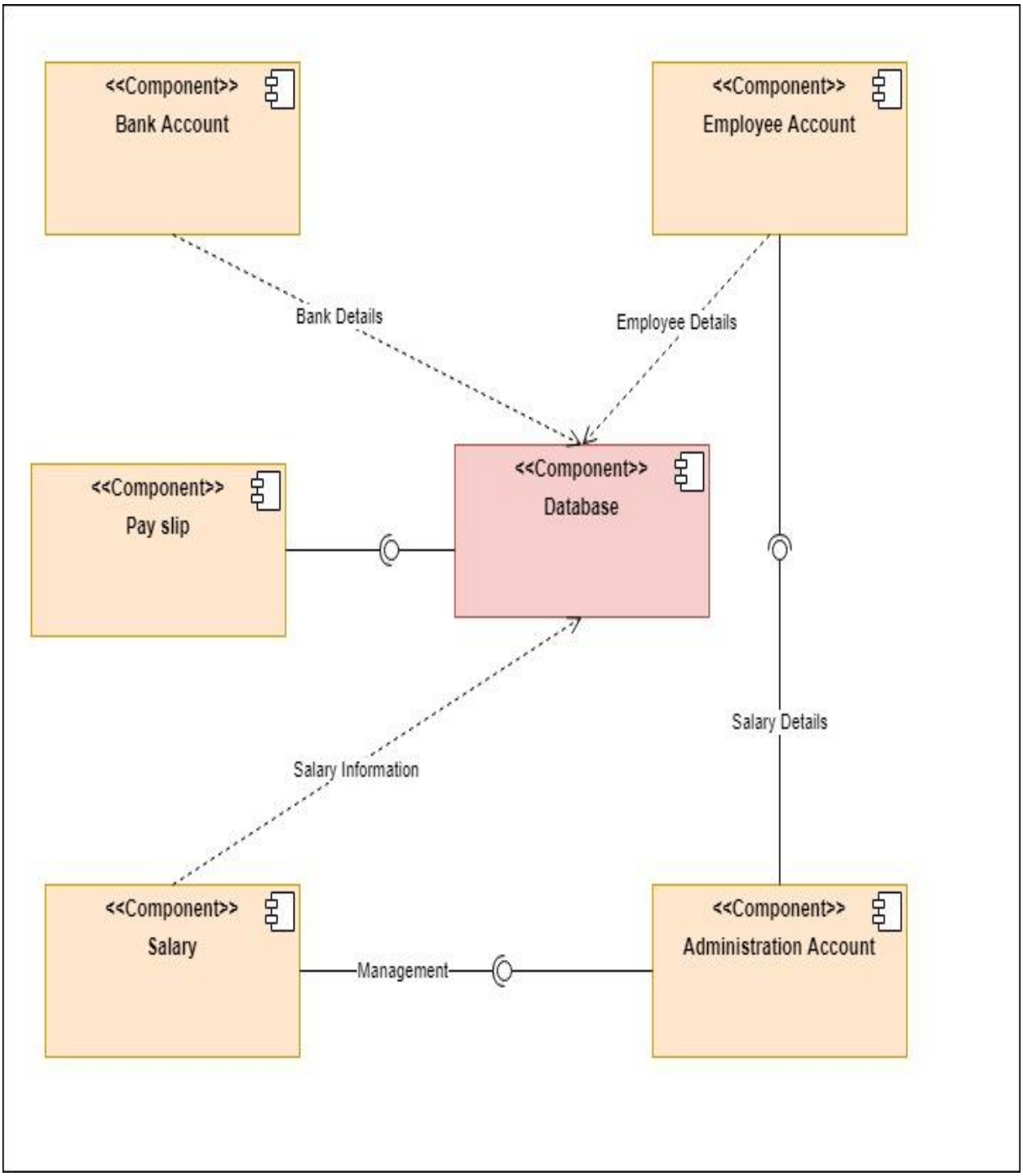
In this section we will discuss state machine diagram for system. State Machine Diagram explains states of objects drawn from Classes.

- **Salary:**



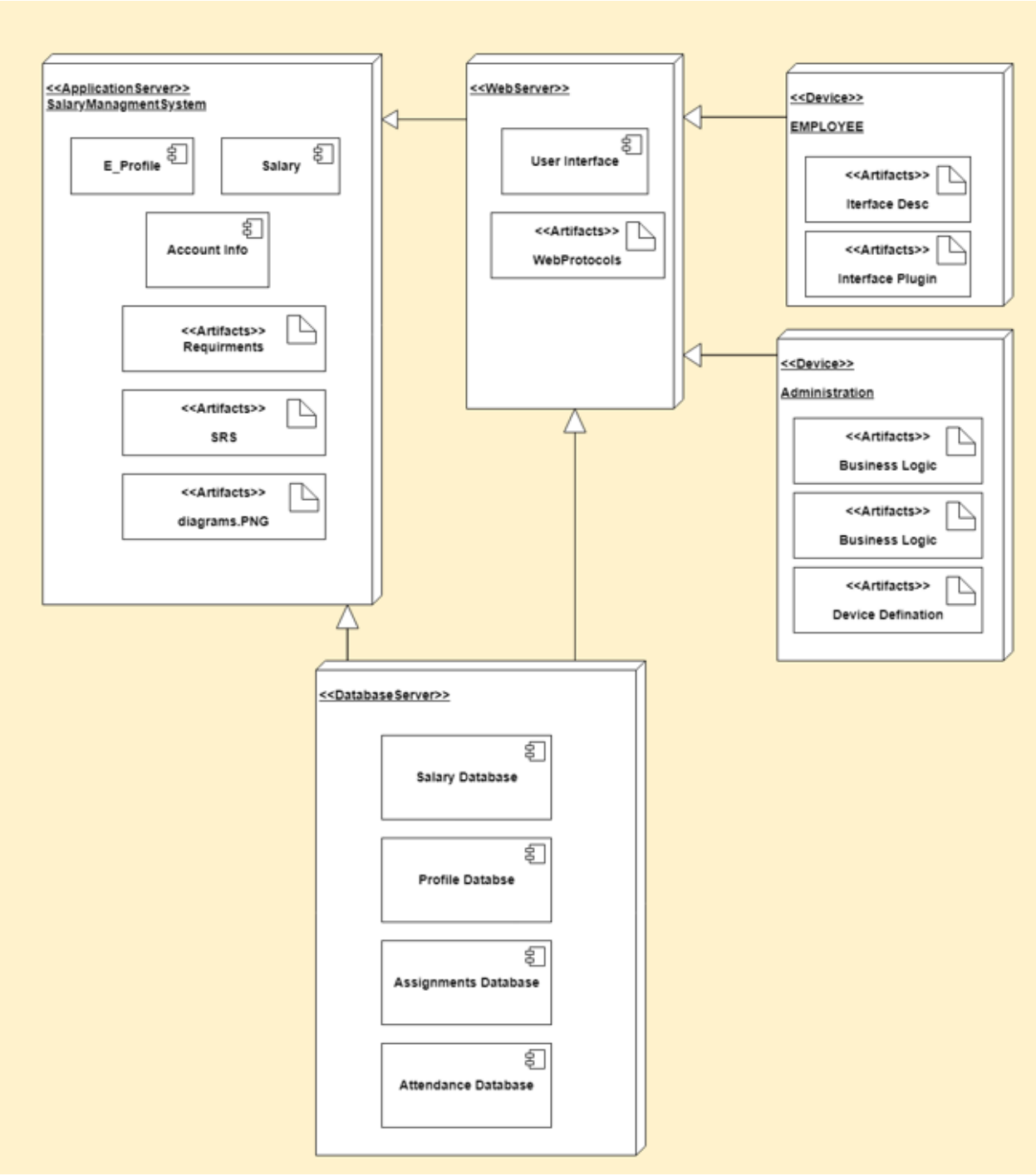
3.9 Component Diagram:

In this section we will discuss component diagram for system. Component Diagram shows different components and show how they're linking with each other.



3.10 Deployment Diagram:

In this section we will discuss deployment diagram for system. Deployment Diagram visualizes how will system deploy. Physical Resources (Nodes), Artifacts and Components are used in deployment diagram.



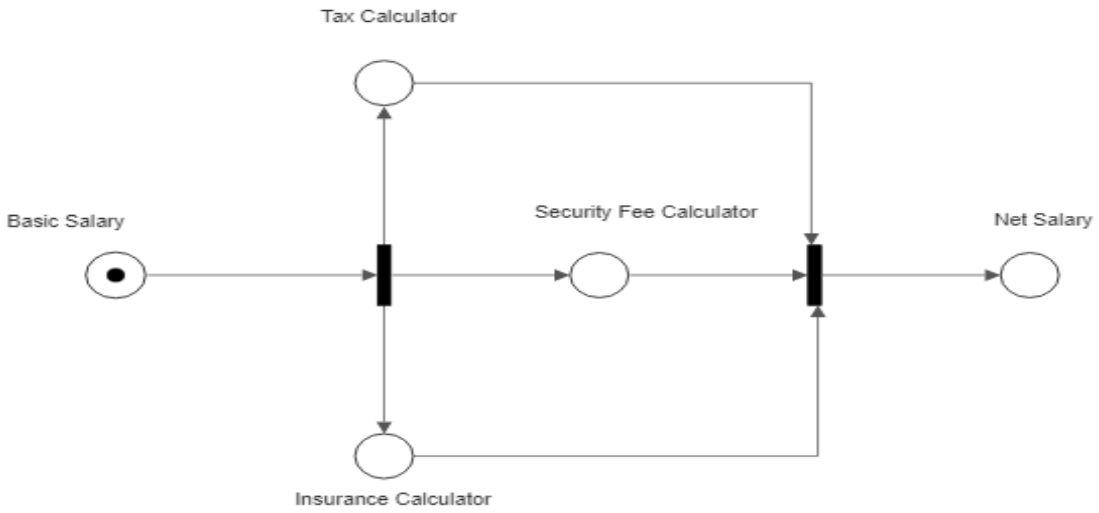
3.11 Petri Net for Salary Calculator:

Since only salary calculator has fluctuations so petri net for salary calculator is only designed

P={P1,P2,P3,P4,P5}

T={T1,T2 }

Note: Initially Basic Salary P1 has token in it.



Input Matrix:

	P1	P2	P3	P4	P5
T1	**1**	**0**	**0**	**0**	**0**
T2	**0**	**1**	**1**	**1**	**1**

Output Matrix:

	P1	P2	P3	P4	P5
T1	**0**	**1**	**1**	**1**	**0**
T2	**0**	**0**	**0**	**0**	**1**

Firing Matrix:

	P1	P2	P3	P4	P5
T1	**1**	**0**	**0**	**0**	**0**
T2	**0**	**1**	**1**	**1**	**1**