

Introduction:

Payroll is a window Application which is used to maintain the Employee details of the organization or concern in different places; this provides each employee details with unique information. Payroll provides database activities where every record of the employee will be maintained in the database. So all the data is retrieved easily and faster. From an administrator point of view, the admin person has the full rights to make decisions like who all the users are and create the statuses, views and modify. On the other hand payroll calculations are defined as the various numbers and processes that are performed by an employer, the sum of which equals an employee's pay. An employer calculates payroll by calculating gross wages and payroll deductions, to arrive at an employee's net pay.

Motivation:

A payroll is a company's record of employees who are entitled to compensation against a fixed period of time or date. Along with the salary data, it also includes employees' information related to attendance, position, leaves status, pay policy etc. Payroll processing involves calculating the actual net pay for every employee in the organization minus necessary deductions (Taxes, Insurance Policies etc) from gross salary. Payroll processing is recognized as one of the most crucial and time-consuming administrative tasks which has to be taken care of with utmost attention. Hence, it's necessary to understand the importance of it in terms of business:

1. PAYROLL SOFTWARE ALLOWS ORGANISATIONS TO BE COMPLIANT :

A payroll system is built in such a way where the calculations of Tax, Government bonuses and allowances are calculated automatically based on a complex set of employment regulation rules. This allows organisations to be compliant with their country's payroll laws by the quick and easy generation, and submission of compliant documents.

2. PAYROLL SOFTWARE ALLOWS ORGANISATIONS TO SAVE TIME AND MONEY:

As Payroll software automates many of the process and manually intensive tasks that come with such processes, over time, organisations realise that their payroll administrators gain more time to be able to work. This is because Payroll is not just about creating payslips, there are several processes (like submitting payroll information to the organisation's finance team and end-of-year documentation) which go unseen by many within an organisation.

3. PAYROLL SYSTEM IS SECURE :

A payroll system requires that authorised users login to view, edit and process payroll data. Secure systems are also provided with additional login security features such as 2 Factor Authentication which ensures that only people who are authorised with payroll, will be able to access the system.

4. It Boosts Employees' Morale:

An ill-managed payroll system is a big no when it comes to winning the trust of your employees. Getting paid on time boosts an employee's morale as it is a clear indication that they can rely on the organization when it comes to maintaining the financial ethics of the company.

So, we can say that using payroll software that is efficient and streamlines the payroll function can be of benefit to organisations in a number of ways. This project has many future applications like it can be used in any of the Retail Outlets of any type of company. To achieve maximum efficiency and reduce the time, the Payroll system is very essential.

System Request

Project Sponsor	Robi, Doa TechSolutions. Co. Ltd, Ray Corporations.
Business Needs	<p>This payroll system will help the administration by providing the best time tracking, attendance, and absence management functionality. It will generate the salary sheet of the employees of the organization that assists the accounts department on the basis of joining records, bonuses, and absent deductions along with auto calculations of some deductions on salary such as Provident fund, Income tax, etc. It will have calendar reminders on special occasions along with legal and financial compliance alerts. The system will not only improve tax services but will also maintain budgeting, financial projections, etc.</p>
Business Requirements	<ul style="list-style-type: none"> ● The system will offer users the to create a company profile also employee profiles. ● It will offer companies to operate their corporate routine online. ● It will offer companies to access employee profiles. ● It will offer employees to record their attendance. ● It will offer employees to select online or offline payment methods. ● It will offer companies the scope to send tax data directly to the government without any third party.
Business Values	<p>Conservative estimations of tangible value to the company include-</p> <ul style="list-style-type: none"> ● One-time organizational subscription of BDT 8500/=. ● Per transaction will cost 1.2% of the transaction amount. ● Editing any information in the company profile will cost 1500/= each time. <p>Conservative estimations of intangible value to the company include-</p>

	<ul style="list-style-type: none"> ● Improving management systems of small companies. ● Having a clean record of employee tax pigmentation to fix tax evasion for the government. ● Hassle-free online easy accessible employee records.
Special Issues and Constraints	<ul style="list-style-type: none"> ● Challenging task to implement all those company and employee information for the first time. ● Some government guidelines must be followed. ● Some government authorized information access will be needed to verify some information.

System Requirements

Requirement analysis helps organizations to determine the actual needs of stakeholders. Requirements analysis covers all the tasks needed to determine the necessities, obligations, needs and the like, for a new or revised project. Requirements analysis plays a major role in when and how that project is completed. A functional requirement defines a system or its components. It describes the functions a software must perform. A function is nothing but inputs, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform. Functional software requirements help you to capture the intended behavior of the system. This behavior may be expressed as functions, services or tasks or which system is required to perform. A non-functional requirement defines the quality attribute of a software system. They represent a set of standards used to judge the specific operation of a system.

Functional Requirements:

Company Profile:

- For first timers, the system will first prompt the Company manager to create an account. For which the manager shall need a company name.
- The system will then ask for a scanned copy of business licenses of that company.
- The system will also need the registration number of the company to check authentication.
- The system will ask for Bank account details and Tax ID of that company.
- The system will also offer the Company to change company name or Bank account details if necessary.

Corporate Structure:

- The system will enable the company manager to insert the number of departments with names and specifications.
- The system will enable the company manager to insert the total number of employees.

- The system will ask the company manager to define their work hour in a 24 hour timesheet with lunch and other breaks.
- The system will ask the manager to fulfill a form about the salary scale designation wise and government tax rate on employee's salary.
- The system will offer the manager to select their yearly office holidays along with government holidays in a calendar type format.

Employee Profile:

- At first the system will offer a form to fill up employee details for example, Name, Age, Education, Address, Email, Phone Number etc.
- The system will ask for the employee's starting year.
- The system will ask for a scanned copy of the employee's NID card .
- The system will ask for employee designation and department.
- The system will offer the manager to search employees by their details.
- The system will also offer the manager to search employees by department, designation or by starting year.
- The system will need employees' Personal Bank account details.
- The system will offer the employee to only view their details.
- The system will offer the manager to view and edit every employee details when ever needed.

Attendance Tracking:

- The system will offer the employee to log into their accounts
- The system will offer the employee to give their attendance on the specific date of a calendar formatted form.
- The system will ask for the manager authentication on the employee attendance.
- The system will offer the employees to leave a note on the absent box of the calendar formatted form for keeping records.\
- The system will keep total attendance and leave count of an employee.

Payment Processing:

- The system will do an auto calculation of the total salary of each employee.

- The system will auto deduct salary for employees' unverified leaves.
- The system will auto add allowance and taxes on employee salaries.
- The system will generate an employee payslip.
- The system will record the salary withdrawal date.
- The system will allow the employee to request their payslip.
- The system will offer the employee to transfer their salary directly to their personal bank account.
- The system will also offer the employee to get a bank check.
- The system will keep track of the total salary transaction.
- The system will also keep track of total tax revenue.

Non-Functional requirements:

Operational:

- The system must support the login of a large number of users and admins at a time.
- The system should be portable so that it will be easier to move from one pc to another and should be connected with the printer and scanner.
- The system should run smoothly on all platforms be it android /iOS /mac /windows etc.
- The home page should be designed nicely so it appeals to the user's visual liking. The background color, font size can be made customizable; giving the users a sense of ownership.

Security:

The user information should be heavily encrypted so there is no possibility of cyber-attacks. Although it is highly recommended that users never leave a PC or a mobile device unattended and personal or financial information displayed while logged into the system, a built-in security feature minimizes the risk in such a situation. Whenever an employee will try to update their details or attendance information such an attempt should be reported to the manager or administrator and when the manager will try to update the

attempt should be reported to the administrator, unsuccessful attempts by a user to access the system shall be recorded on an audit trail etc. Lastly, the company must ensure that the “Digital Security Act 2018” is maintained strictly.

Performance:

Performance based requirements such as availability of the system 24/7, reliability for all end users along with user-friendly components. The most important functionality is that the overall system should be fast and error free. The system must not require expensive hardware to run smoothly. The system must be optimized so that it doesn't waste device memory.

Cultural and Political:

The system must come in accordance with the existing government laws. The extreme personal details such as national id number, house address of one user should never be visible to other users and it is protected compliance with the Data Protection Act. And the system will conform to the country's “Cyber Activity Laws”.

Scenario: Online Payroll System

“LEMON” is an online platform where various companies, from smaller startups to leading organizations can easily keep an online trace of their employee status and finance to keep their administration swift and organized. In the system admin, employee and administration have relationships with different use cases according to the functionality of the system. When a company “XYZ” will use the system for the first time, the system will ask for creating an account and to open an account they need to give some documents to register and then the admin will check the authenticity of that company and will allow them to use the system. The system will enable the company manager to insert the number of departments with names and specifications like total number of employees, define their work hour in a 24 hour timesheet, salary scale and government tax rate on employee’s salary at. For employee profiles our system will offer a form to fill up employee details for example, Name, Age, Education, Address, Email, Phone Number, and Bank Account Details to verify. The system will offer the employee to only view their details, only the manager will be enabled to view and edit employee details if it's needed. Whenever an employee comes to office he/she needs to give an attendance through the system. According to that the system will keep record of total attendance. The system will do an auto calculation of the total salary of each employee and also deduct some if there's any absence and the deduction will also include tax. After the fixation the system will keep record of the total transaction history also sending the total tax revenue to IRS. Then employees will download the pay slip and will transfer their salary according to their preference.

Actors:

Primary actors:

1. Company
2. Manager
3. Employee.

Secondary actors:

1. WHOIS (Business licenses and Registration number Checker)
2. Bank
3. IRS (Tax ID Checker)
4. Google Calendar.
5. Service NID
6. Manager
7. Google Accessories
8. Google Sheets
9. Google Calendar
10. Database
11. Education Board
12. Authority

Use case diagrams:

1. Company Profile
2. Corporate Structure
3. Employee Details
4. Attendance Tracking
5. Payment Process

Activity diagrams:

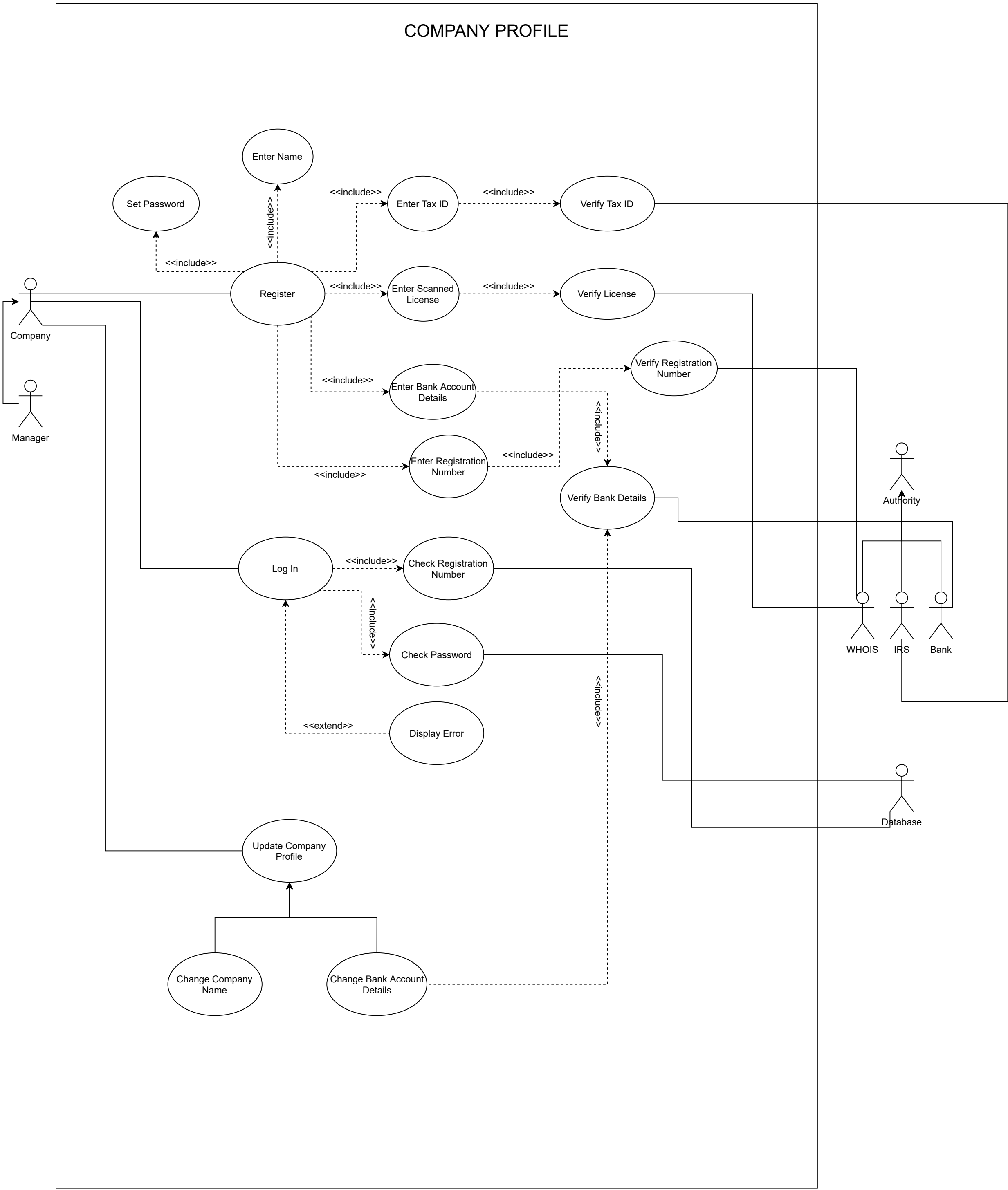
1. Company Profile
2. Corporate Structure and Employee Details
3. Attendance Tracking and Payment Process

USE CASE DIAGRAMS

Company Profile:

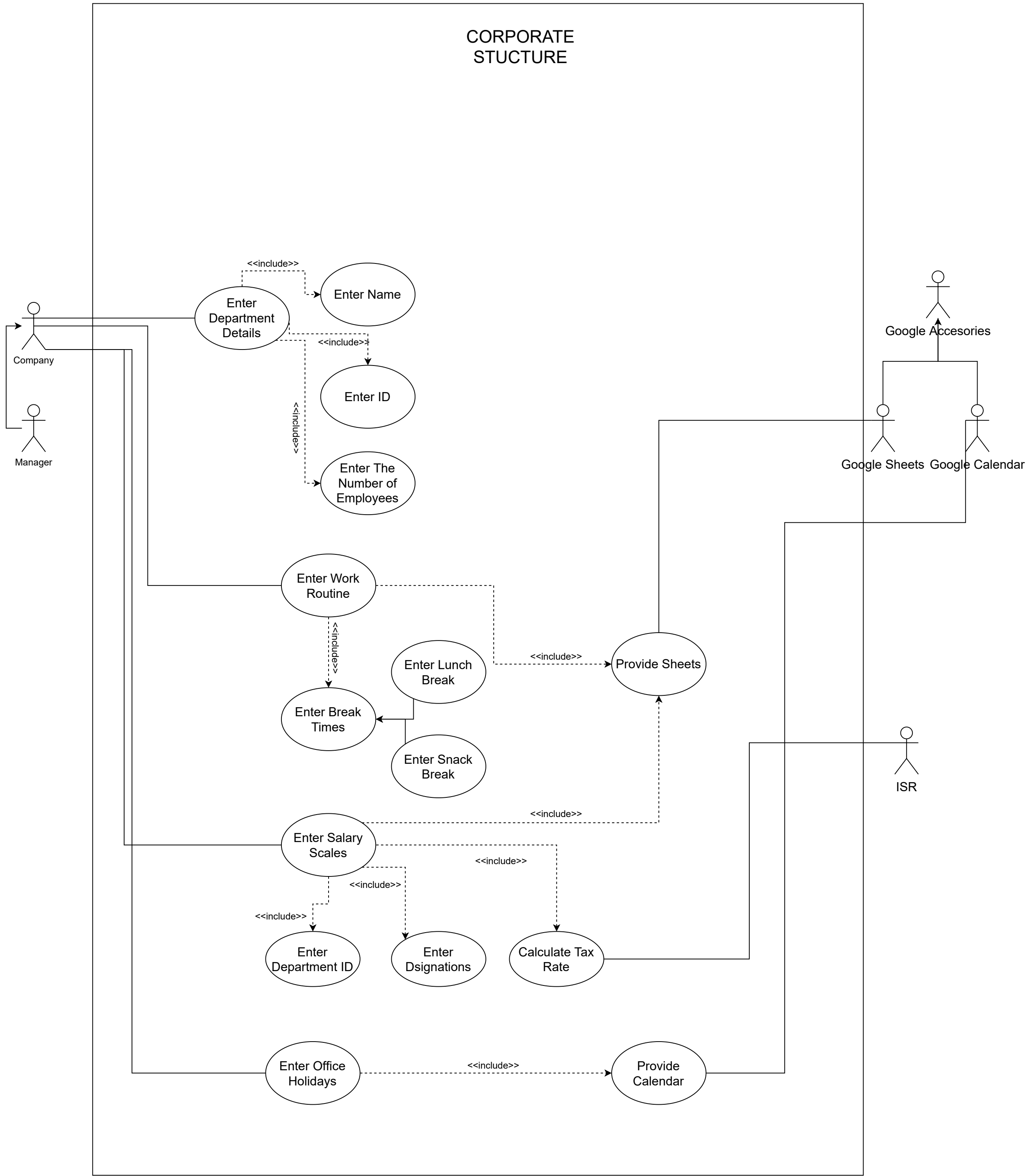
When a company will use the system for the first time, the system will ask for creating an account, and to open an account they need to give some documents to register, and then the admin will check the authenticity of that company and will allow them to use the system.

Use Case Diagrams



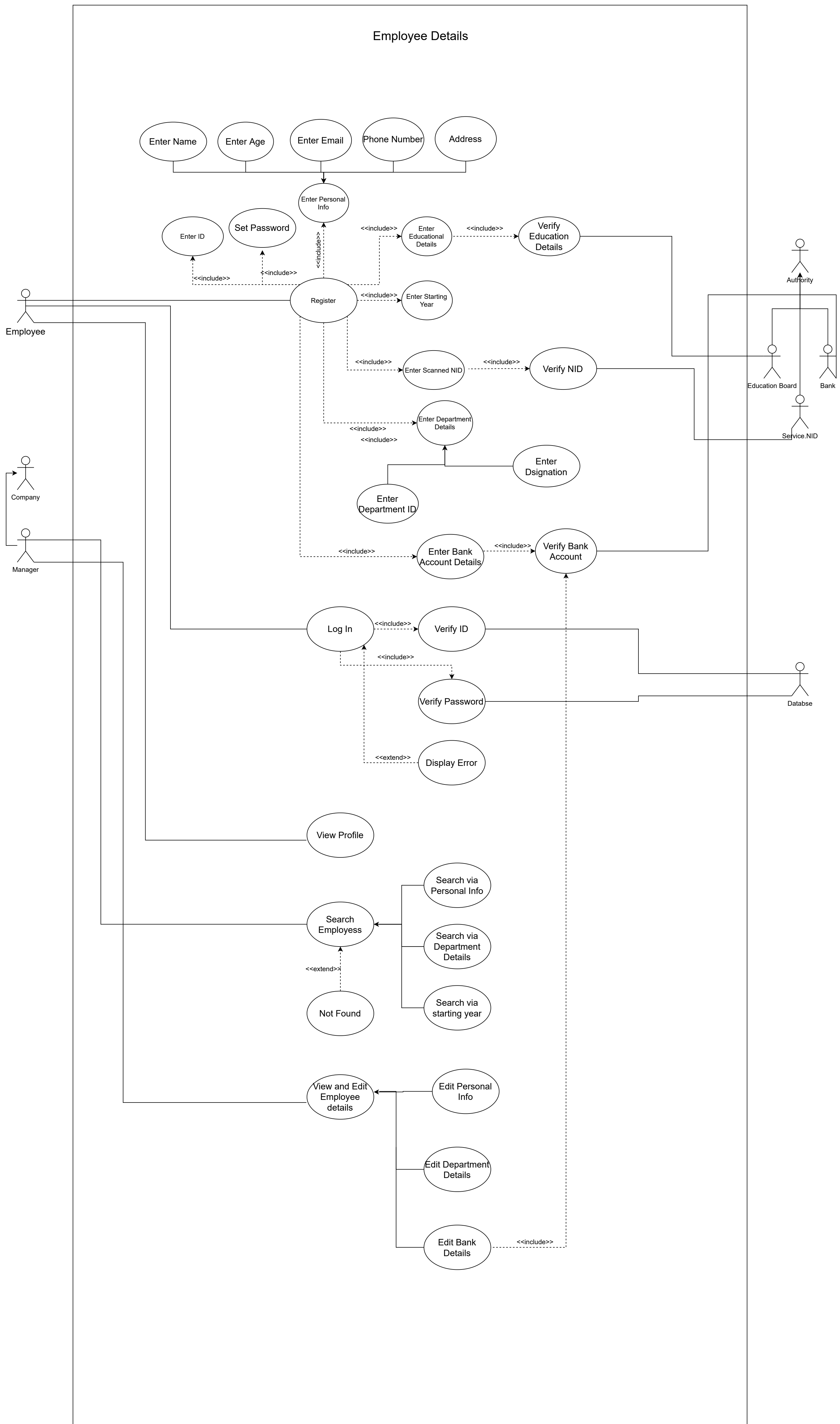
CORPORATE STRUCTURE:

The system will enable the company manager to insert the number of departments with names and specifications like a total number of employees, define their work hours in a 24-hour timesheet, salary scale, and government tax rate on employee's salary.



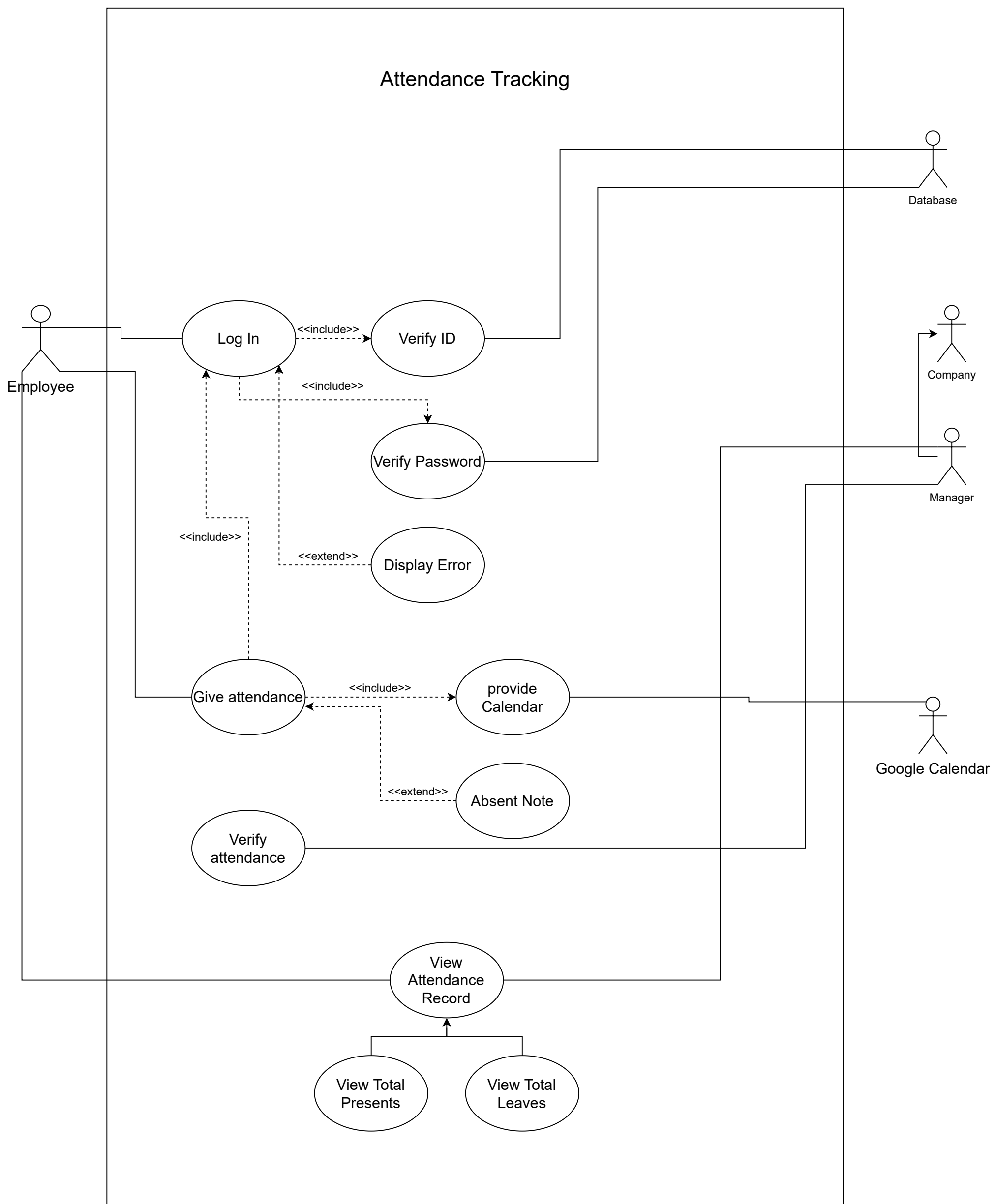
EMPLOYEE DETAILS:

For employee profiles our system will offer a form to fill up employee details, for example, Name, Age, Education, Address, Email, Phone Number, Bank Account Details to verify. The system will offer the employee to only view their details, only the manager will be enabled to view and edit employee details if it's needed.



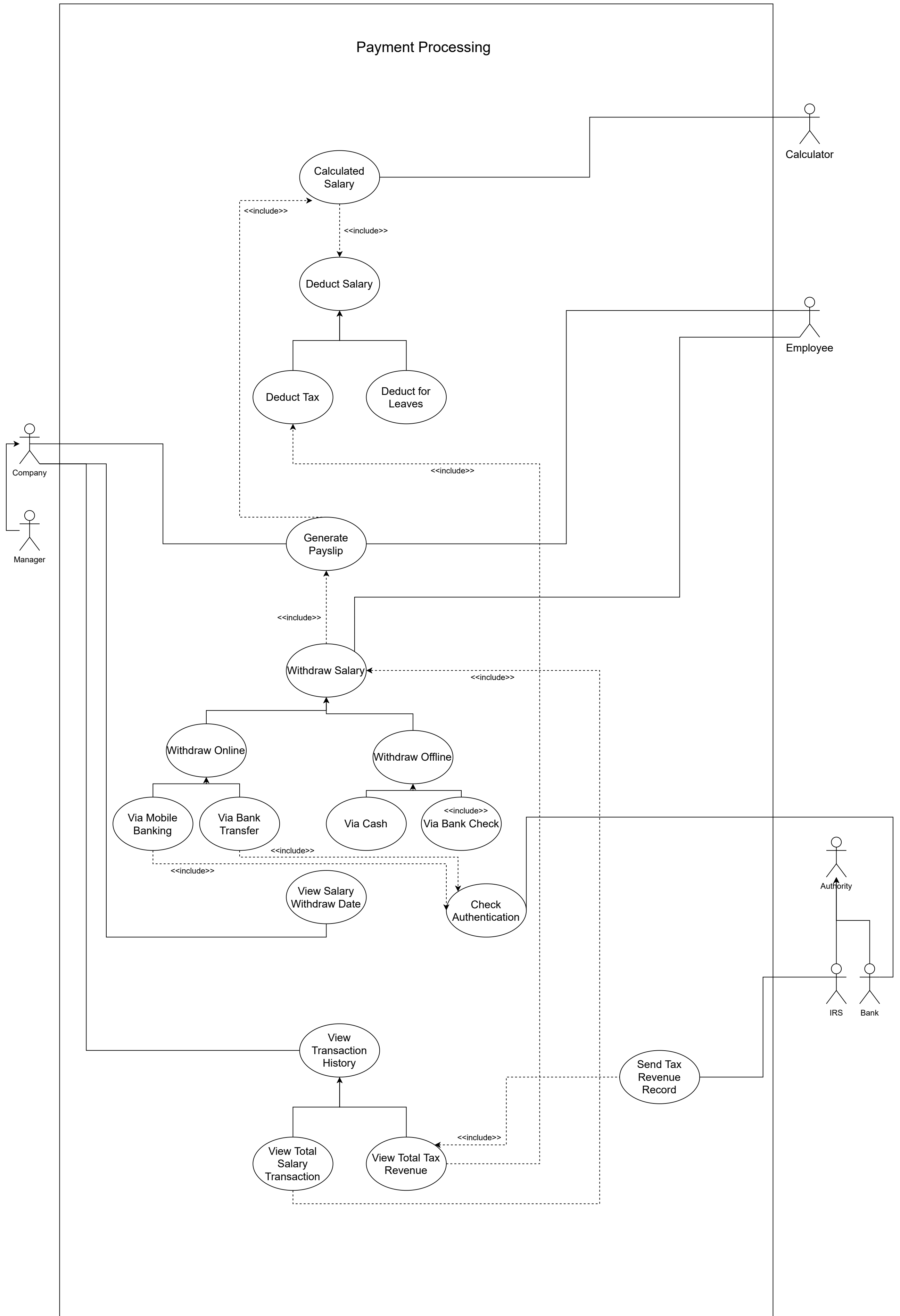
ATTENDANCE TRACKING:

Whenever an employee comes to the office he/she needs to give n attendance through the system. According to that, the system will keep a record of total attendance. The system will do an auto calculation of the total salary of each employee and also deduct some if there's any absence and the deduction will also include tax.



PAYMENT PROCESSING:

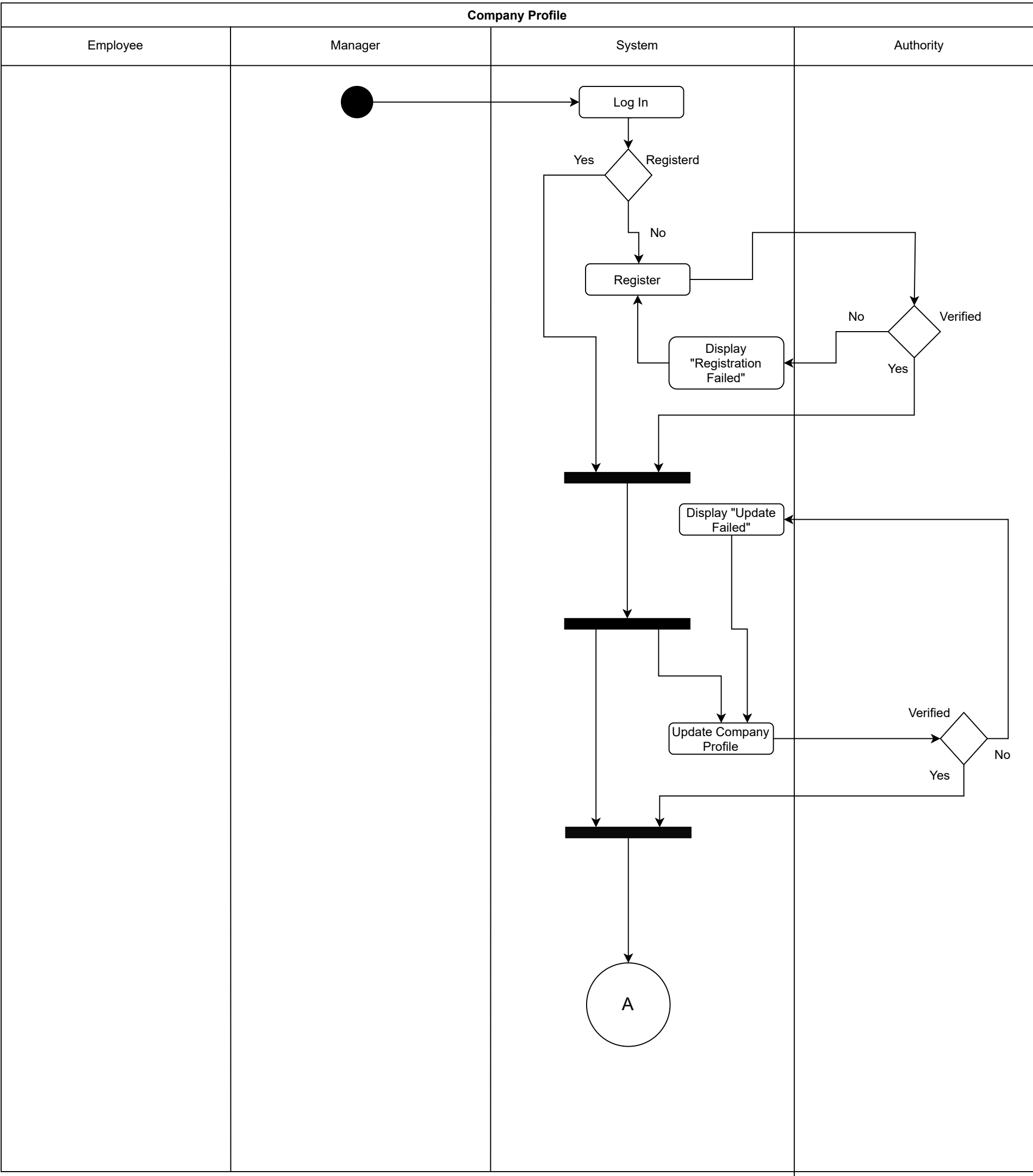
After the fixation of everything including tax, attendance, etc the system will keep a record of the total transaction history also sending the total tax revenue to IRS. Then employees will download the payslip and will transfer their salary according to their preference.

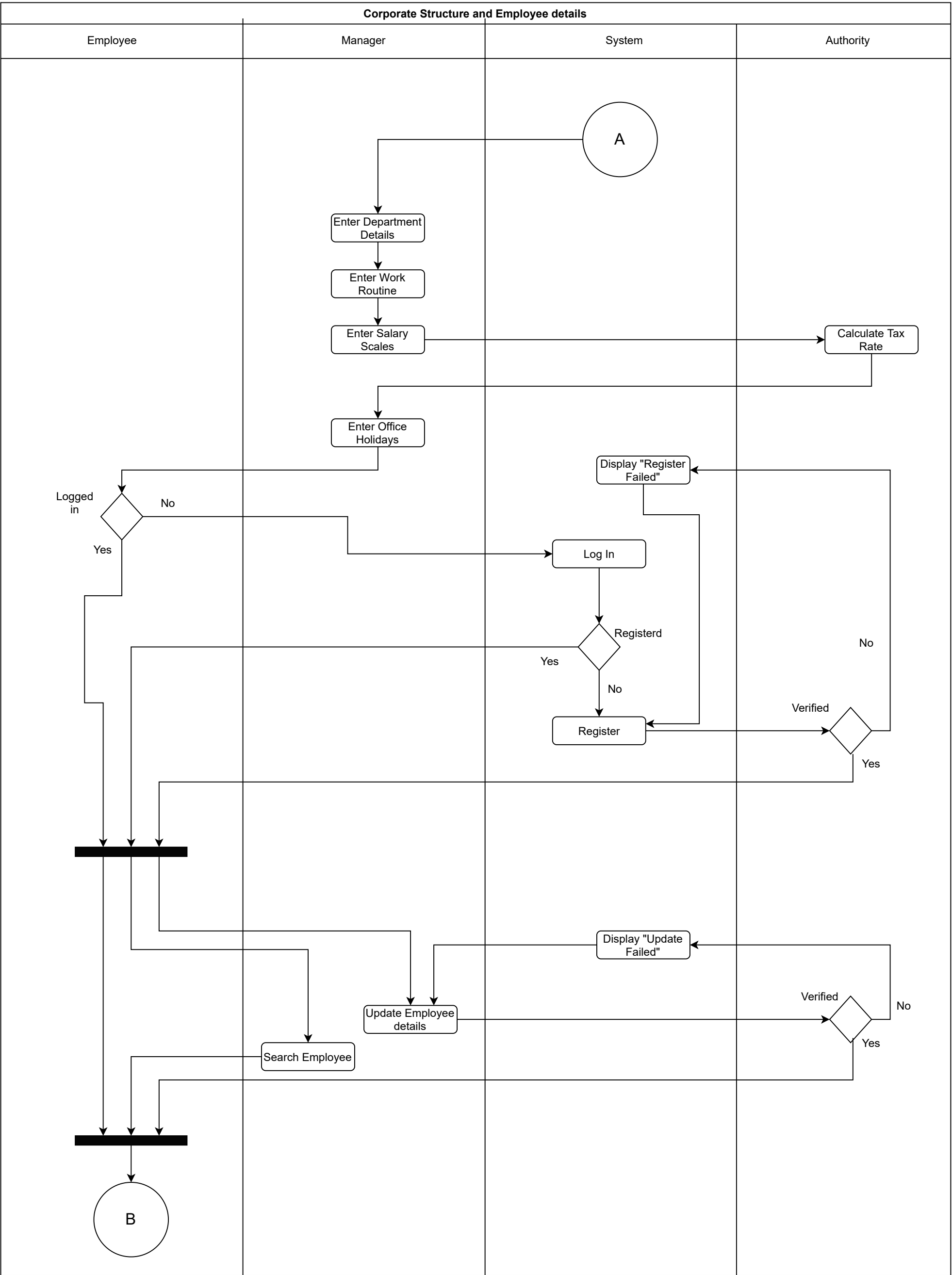


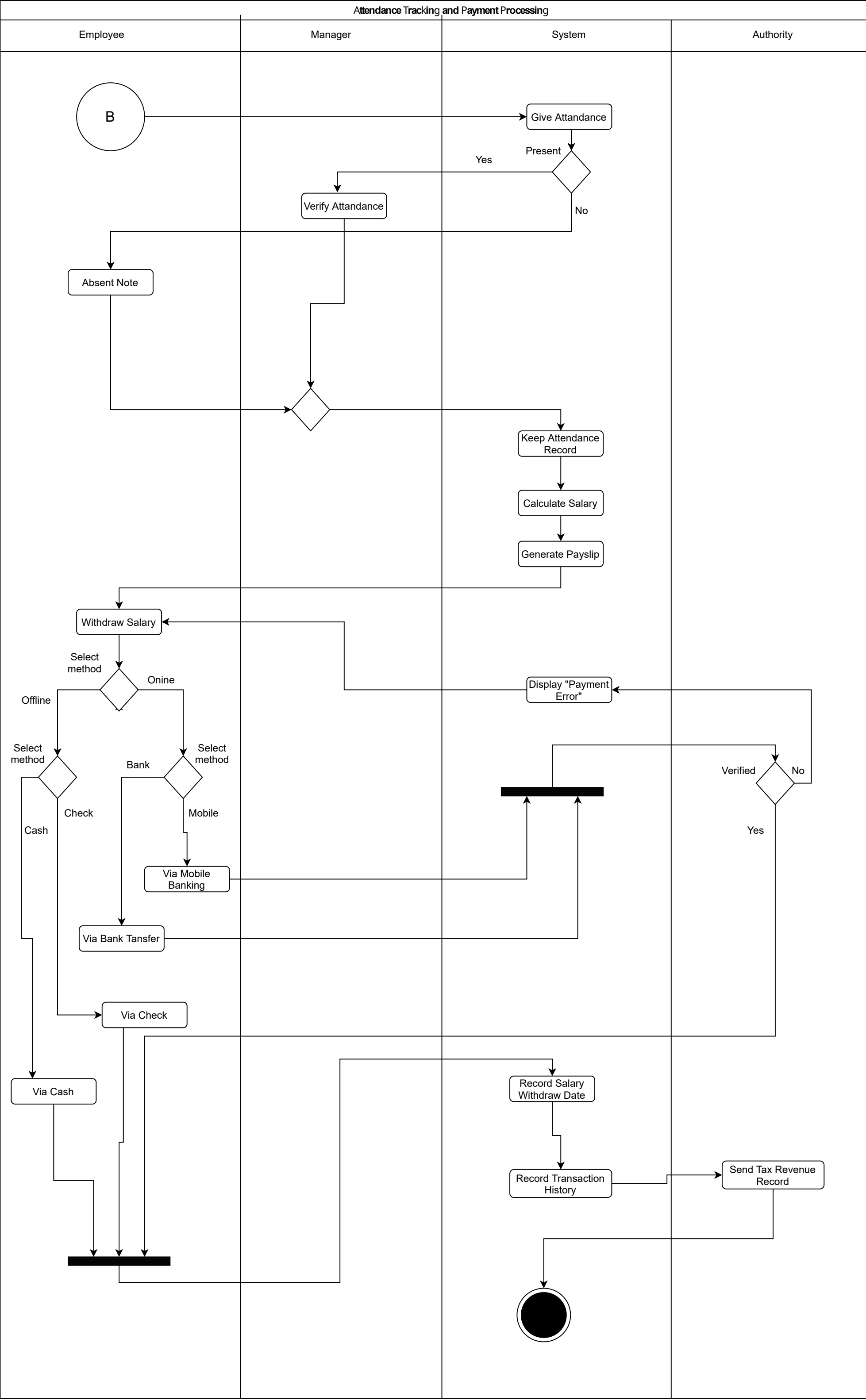
Activity Diagram

Here in the activity diagram we showed the flow of the number of activities or functionalities which will occur accordingly from the company profile to corporate structure and details also attendance tracking, payment processing. Whenever the manager or employee tries to log in they can if they have that access, if not then it will show registration failed. Later on they can view or do what they need to. Employees need to give attendance then the system will verify that and for those who are absent, the system will record this and their monthly salary will be deducted from their gross salary. If the salary is available then the system will calculate, confirm and dispatch the salary and if not then it will ask the employee to come later. Also employees can choose their withdrawal option like cash, check or mobile banking and finally the system will record the withdrawal history.

Activity Diagrams





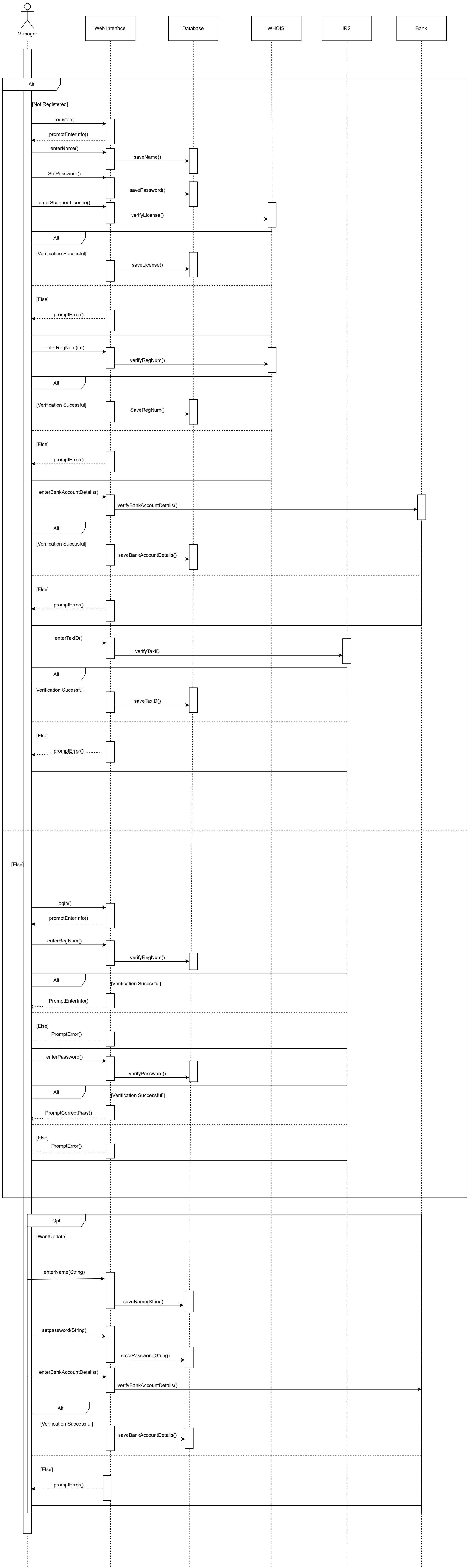


Sequence Diagram

Company Profile:

For first timers, the system will first prompt the Company manager to create an account. For which the manager shall need a company name. Then the system will then ask for a scanned copy of business licenses of that company. The system will also need the registration number of the company to check authentication. The system will ask for Bank account details and Tax ID of that company. The system will also offer the Company to change company name or Bank account details if necessary.

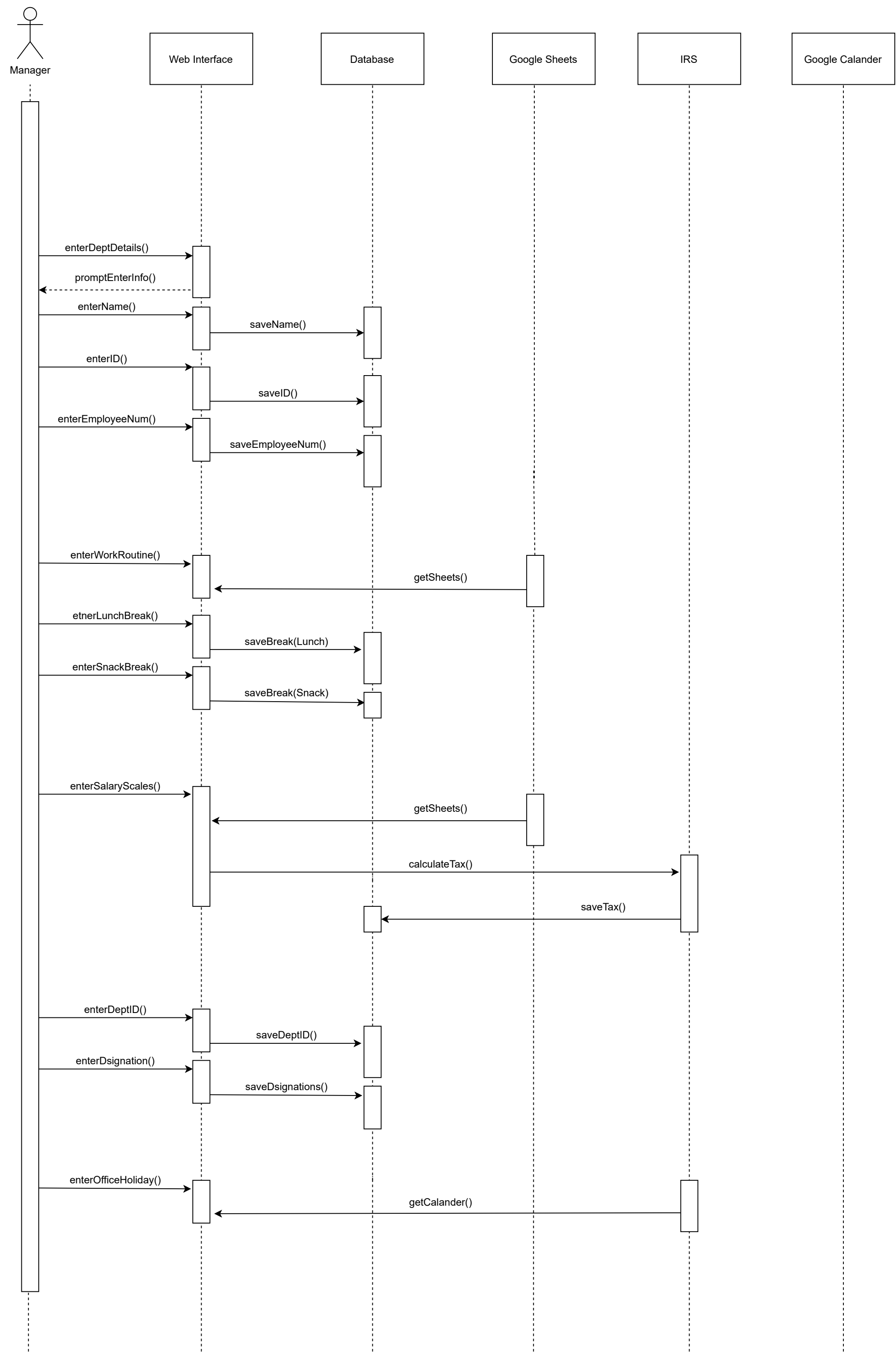
Company Profile



Corporate Structure:

The system will enable the company manager to insert the number of departments with names and specifications. The system will enable the company manager to insert the total number of employees. The system will ask the company manager to define their work hour in a 24 hour timesheet with lunch and other breaks. The system will ask the manager to fulfill a form about the salary scale designation wise and government tax rate on employee's salary. The system will offer the manager to select their yearly office holidays along with government holidays in a calendar type format.

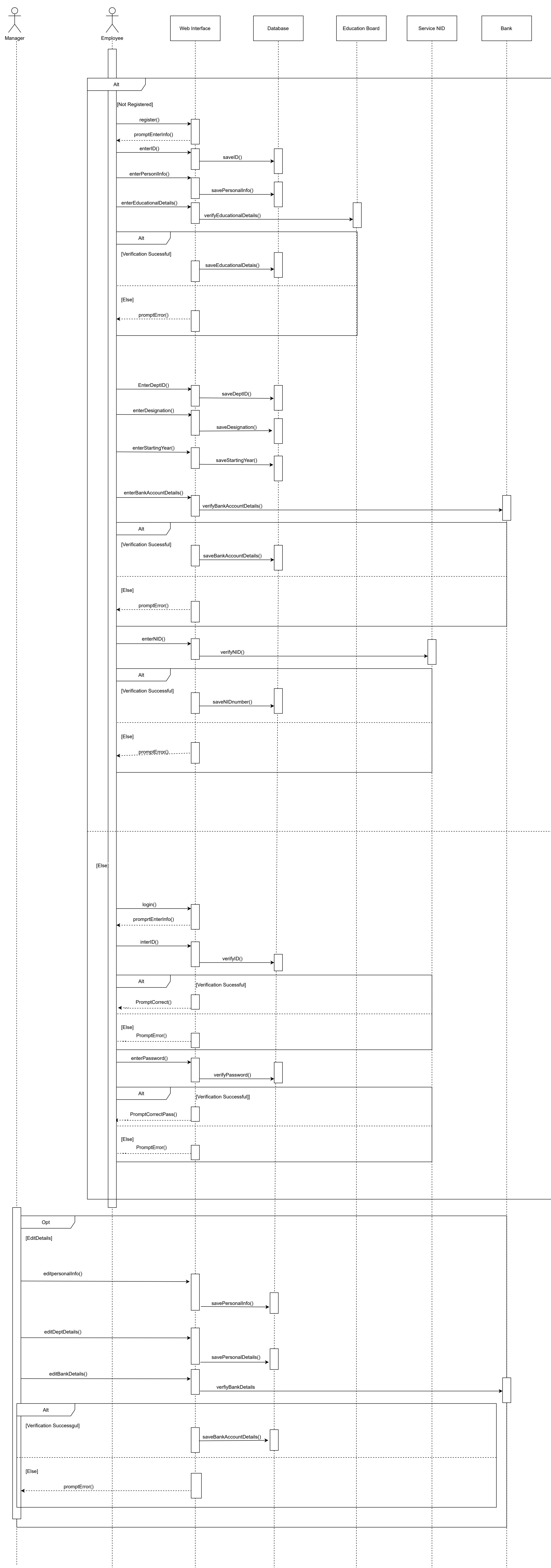
Corporate Structure



Employee Profile:

At first the system will offer a form to fill up employee details for example, Name, Age, Education, Address, Email, Phone Number etc. The system will ask for the employee's starting year. The system will ask for a scanned copy of the employee's NID card . The system will ask for employee designation and department. The system will offer the manager to search employees by their details. The system will also offer the manager to search employees by department, designation or by starting year. The system will need employees' Personal Bank account details. The system will offer the employee to only view their details. The system will offer the manager to view and edit every employee details when ever needed.

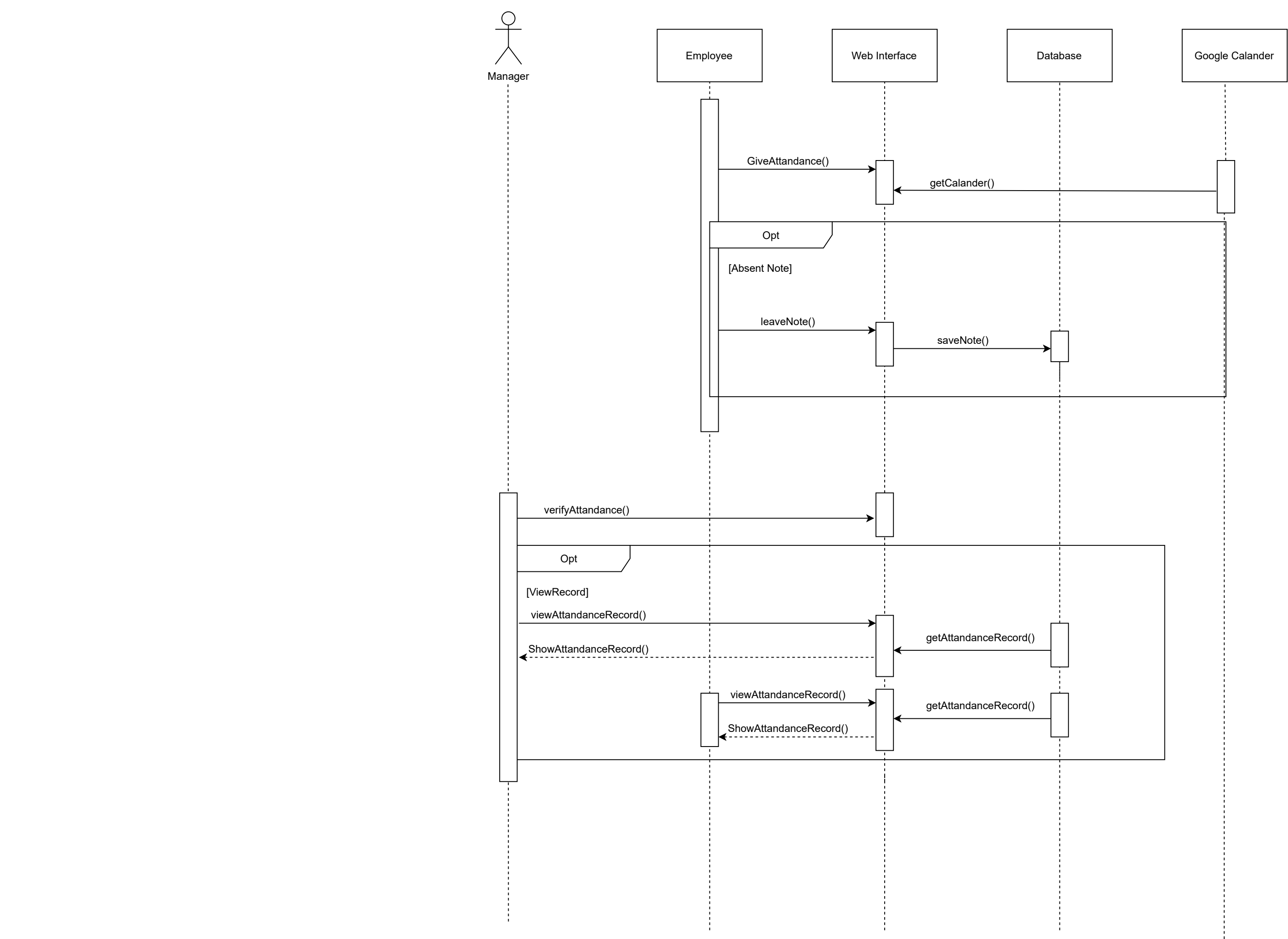
Employee Profile



Attendance Tracking:

The system will offer the employee to log into their accounts . The system will offer the employee to give their attendance on the specific date of a calendar formatted form. The system will ask for the manager authentication on the employee attendance. The system will offer the employees to leave a note on the absent box of the calendar formatted form for keeping records. The system will keep total attendance and leave count of an employee.

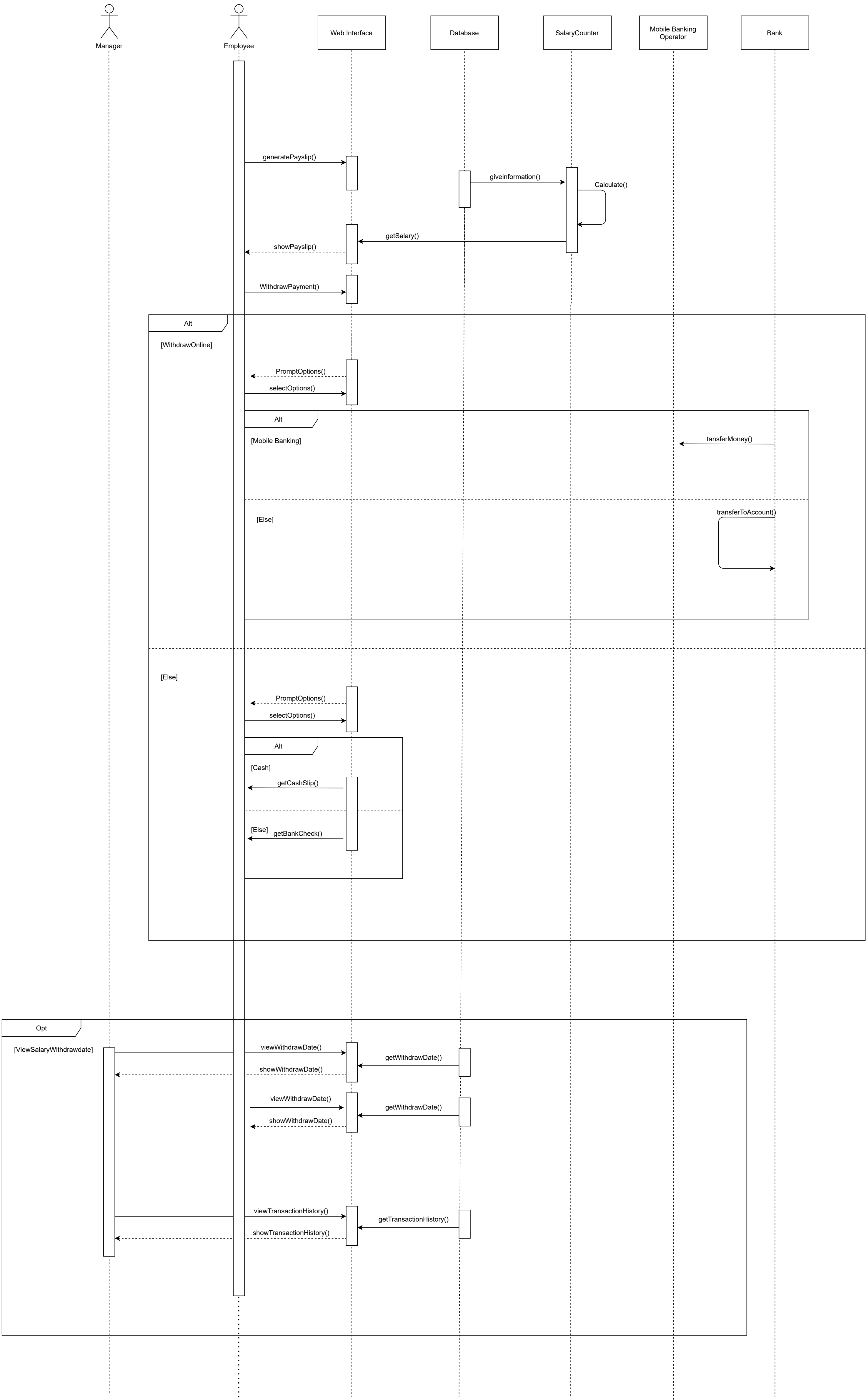
Attendance Tracking



Payment Processing:

The system will do an auto calculation of the total salary of each employee. The system will auto deduct salary for employees' unverified leaves. The system will auto add allowance and taxes on employee salaries. The system will generate an employee payslip. The system will record the salary withdrawal date. The system will allow the employee to request their payslip. The system will offer the employee to transfer their salary directly to their personal bank account. The system will also offer the employee to get a bank check. The system will keep track of the total salary transaction. The system will also keep track of total tax revenue.

Payment Processing



State Machine

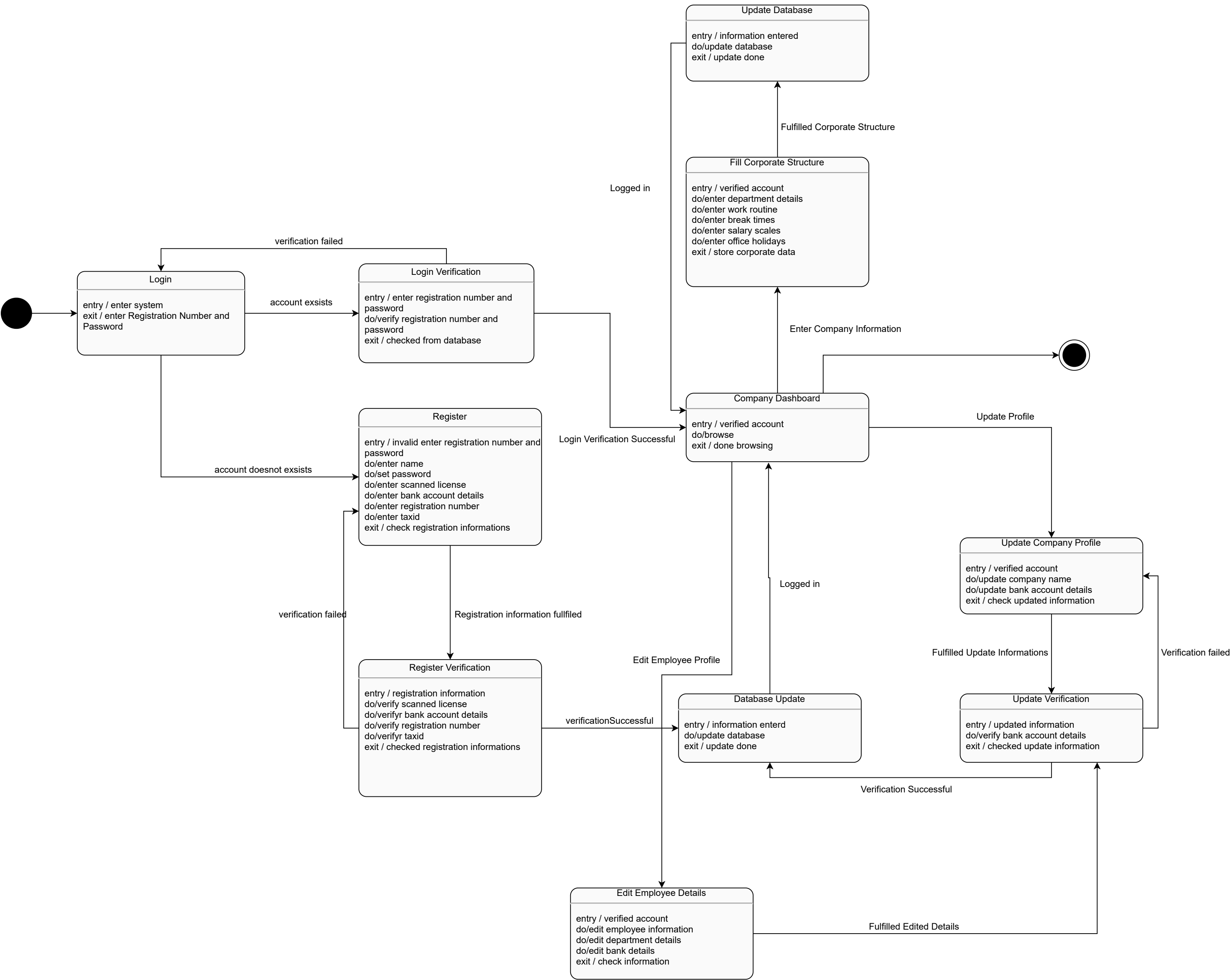
Here, we approached the State Machine diagrams in two perspectives.

1. Company Perspective.
2. Employee Perspective.

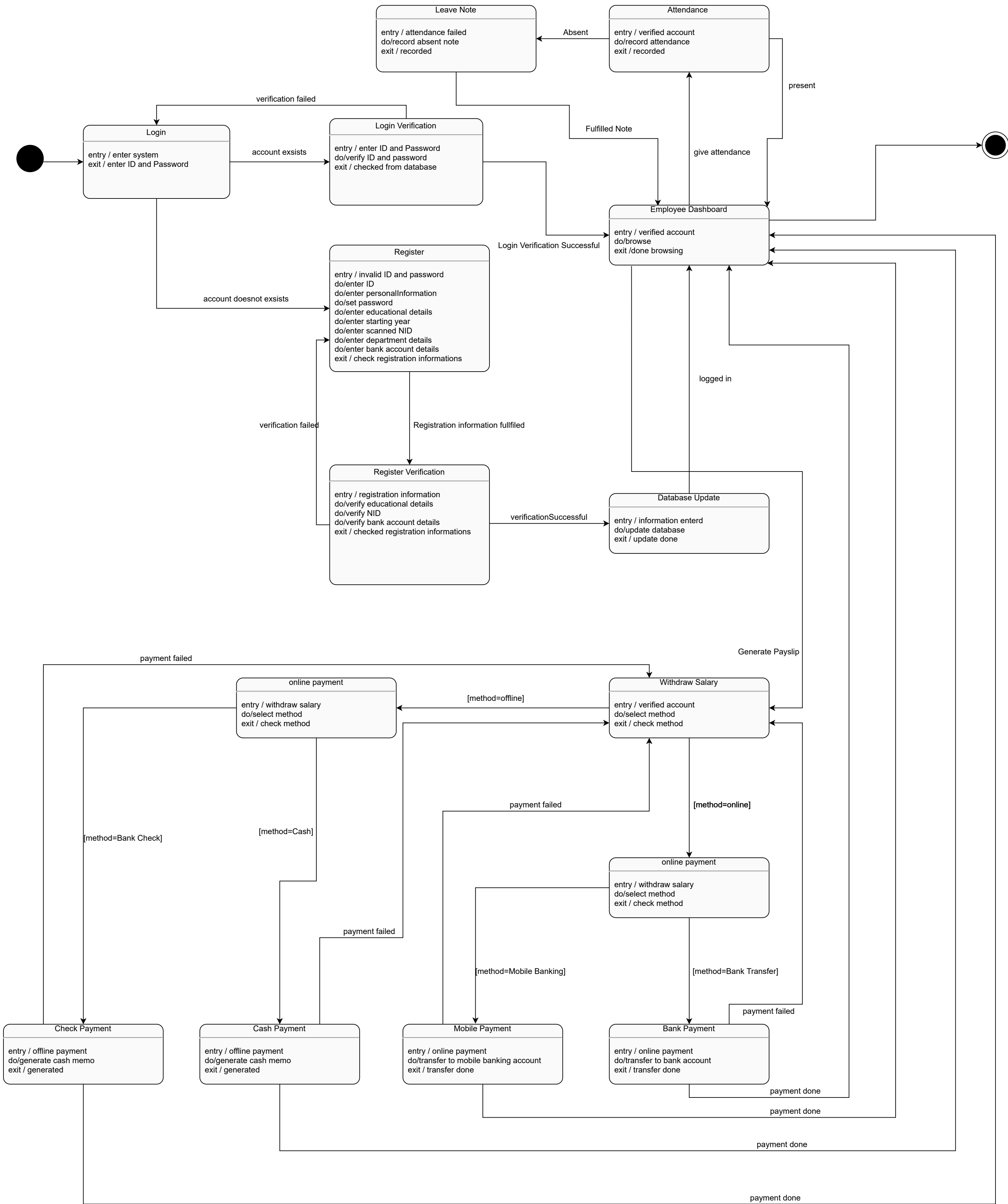
In Company Perspective the diagram focuses on the Functional Requirements of generalised company actors which is mainly the manager. In this diagram, manager can login to account if login is failed then the system will ask the manager to register. After registration verification the information will be stored to the database and the user can update the database anytime using the dashboard. After successful login the manager will end up in the company dashboard where he can browse, edit employee details and Fill Informations according to Corporate Structure which will be saved to the database as well.

In Employee Perspective the diagram focuses on the Functional Requirements of actor Employee. In this diagram, employees can login to account if login is failed then the system will ask the employee to register. After registration verification the information will be stored to the database. After successful login the employee will end up in the employee dashboard from where they can record attendance along with the option to leave a note if absent, can withdraw salary by generating payslip. Employees can get payment both online and offline via bank transfer, mobile banking, cash and check.

Company Prespective



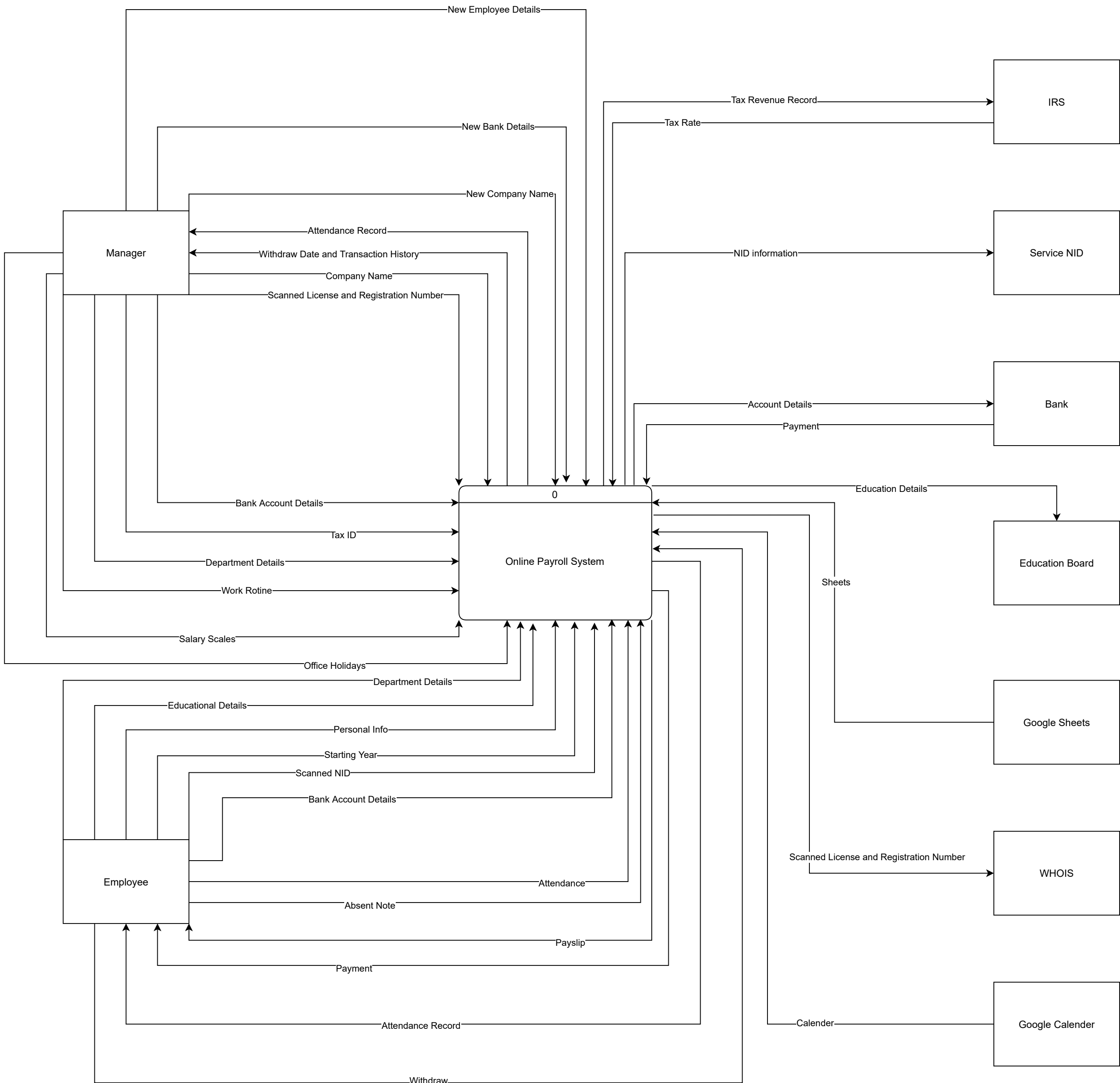
Employee Prespective



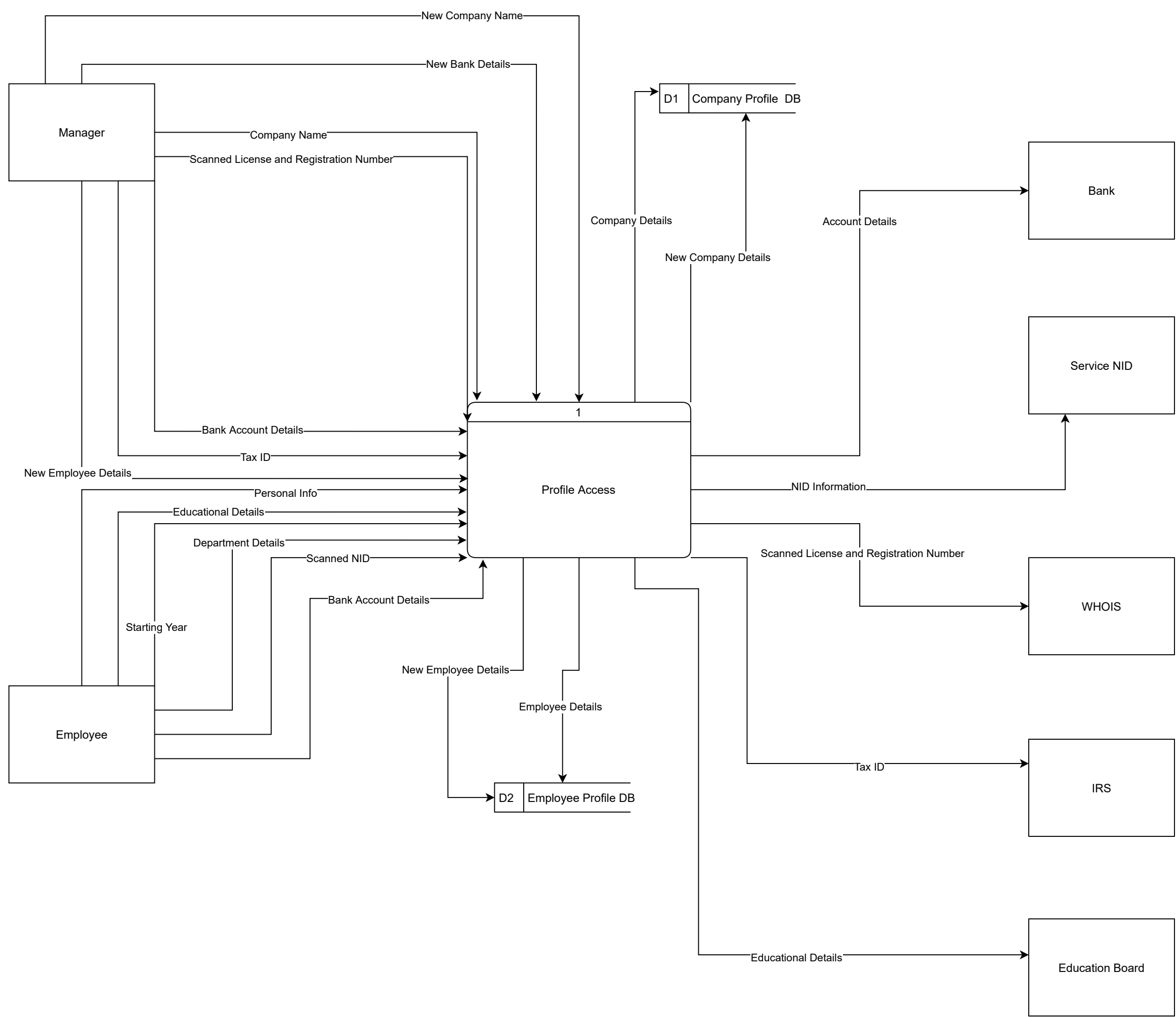
Data Flow Diagrams

We have divided this Online Payroll System which is Level Zero into three parts, these are Profile access (Level 1), Corporate chores(Level 2) and Payment processing(Level 3). In Profile access the manager needs to give the company name and bank details which will be saved in the company profile database (D1). Then the Employee will put the personal information, NID, educational details which will be saved in the employee profile database(D2). All this information will be sent accordingly to the Bank, WHOIS, IRS and Education Board. After that in corporate chores the employee will put attendance and absent notes which will go into the attendance database(D4) and also the manager will give salary scale, office holidays, routines etc which will be saved in Chores structure database(D3). Salary will be saved in the salary store database(D5) and Google sheets and calendar will be used here. Finally in payment processing employees will take the payslip to withdraw their salary from the bank but before that payment process will look into the attendance details database, chores structure database, salary store database and also company profile database to verify and fix the salary. Moreover, the IRS will give the tax rate for salary fixation. Transaction history and withdrawal date will be saved in the salary store database.

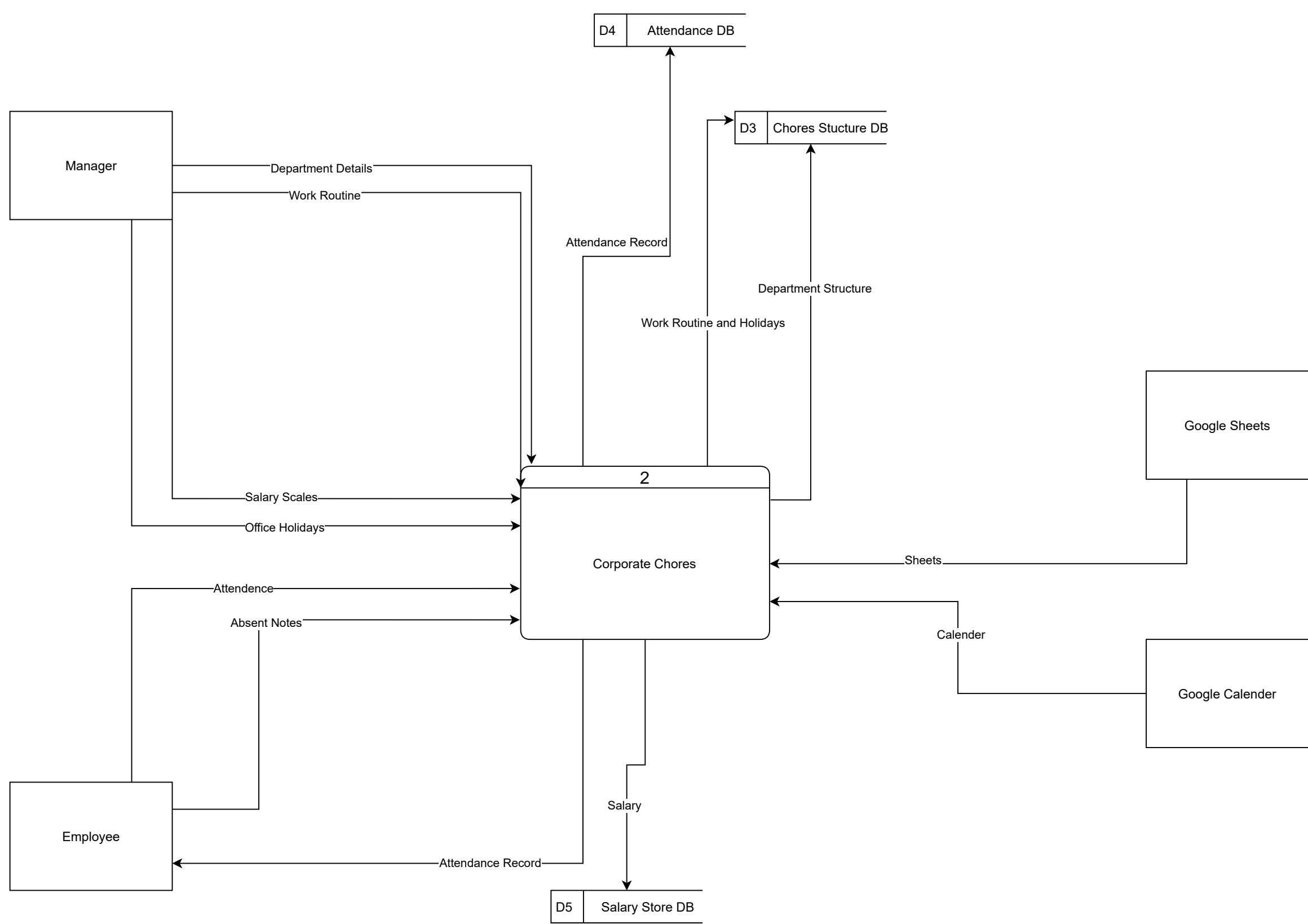
Level 0 -Online Payroll System



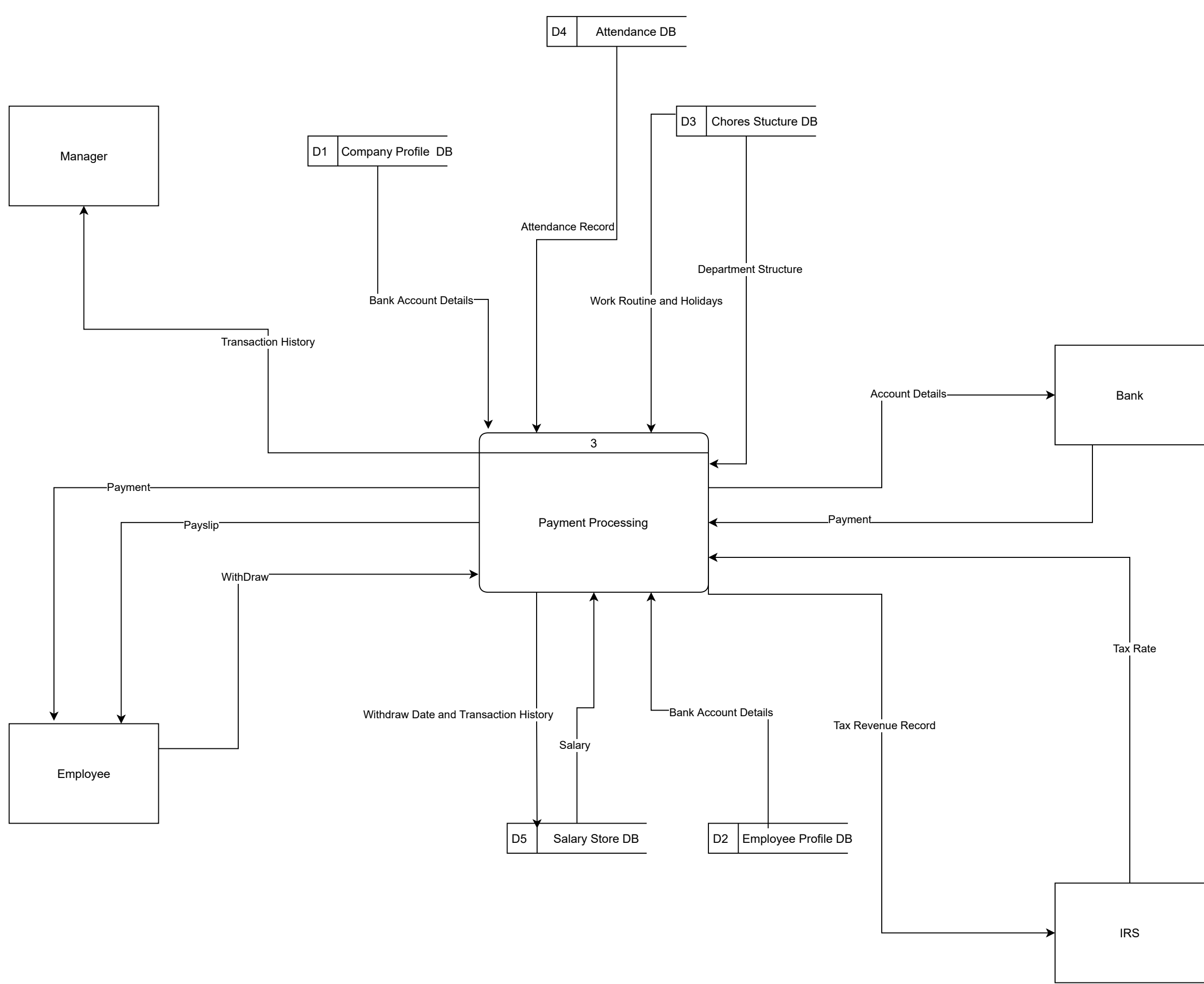
Level 1 - Profile Access



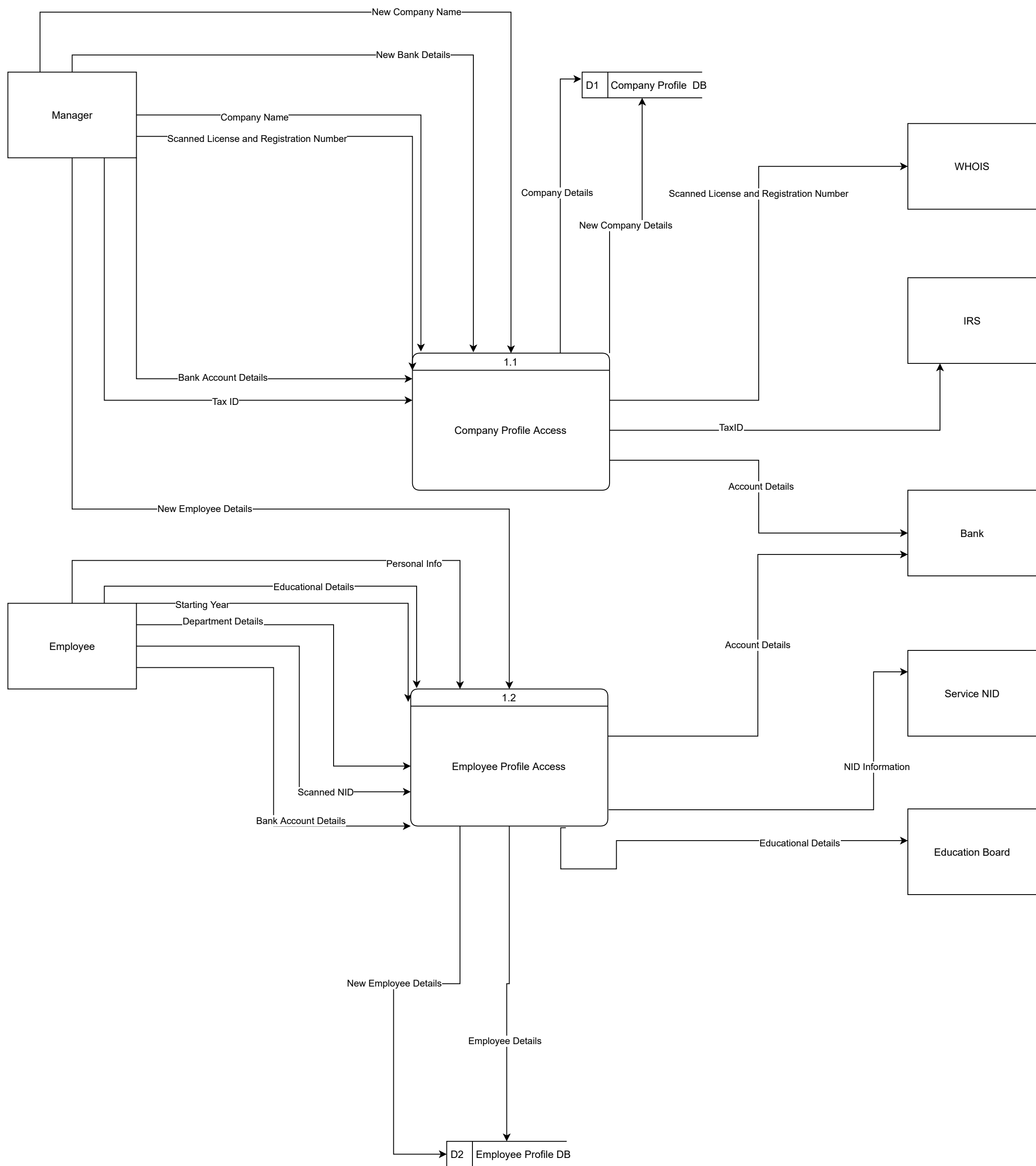
Level 1 - Corporate Chores



Level 1- Payment Processing



Level 2 - Decomposing of Profile Access



Windows Navigation Diagrams

Lemon is basically divided into two Windows Navigation Systems, one is for the Company's navigation and the other is for Employee's navigation. Therefore, the diagrams are also divided into two Windows Navigation Diagrams.

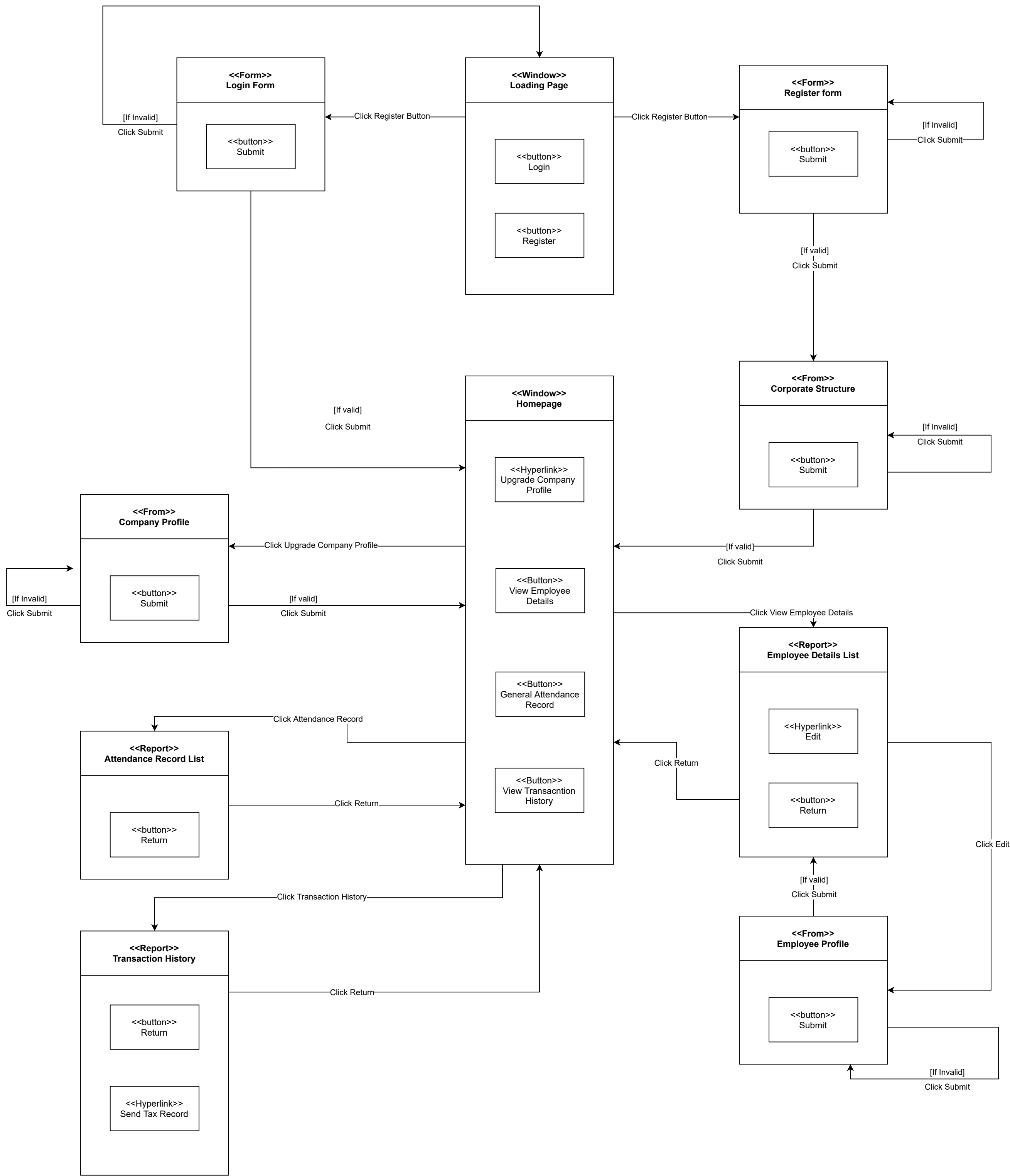
Company Windows Navigation Diagram:

In this diagram, an actor representing a company such as a manager can log in or register into the system. If login is valid then the actor will have access to the homepage form where he/she can select View Employee Details, General Attendance Record, Upgrade Company Profile, View Transaction History buttons which will allow them to do major changes via new form or show them the reports of desired records. From, Employee Details List the user can jump into the edit profile hyperlink to edit employee profiles. And at the end, the company can send their tax record to the IRS.

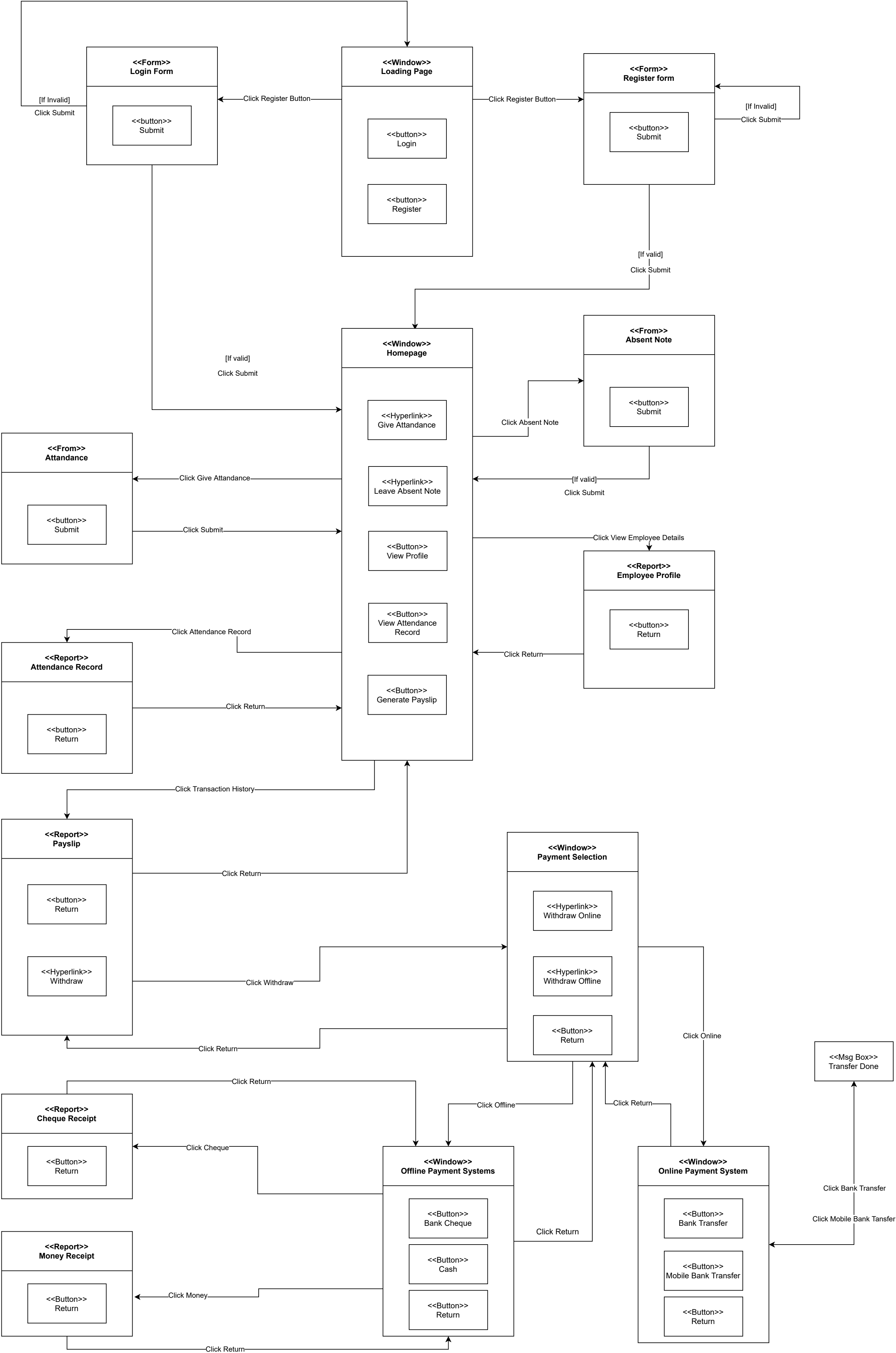
Employee Windows Navigation Diagram:

In this diagram, the actor employee can do log in and register in the system using forms. After a successful login, the user can select Give Attendance, Leave Absent Note, View Profile, View Attendance Record, Generate Payslip buttons to browse more windows, reports, or forms as per his/her desire. From the Payslip report, the user can click on the withdraw hyperlink to get into a new window named Payment Selection from where they can select their preferred payment methods for example Bank Transfer, Mobile Bank Transfer, Cash, Bank Cheque. After the payment is done the user will get a Payment Done message. And from the Attendance form, the user can submit their attendance if not they can also submit their absent note in another form.

Company Windows Navigations Diagram



Employee Windows Navigation Diagram



Summary and Conclusion:

Finally, we can say that in order to make our Online Payroll System we first gathered the system request and then did requirement analysis regarding what and how the system will provide functionalities to its end users as well as anyone related to the system. Then, we used several UML diagrams to depict the visual representation about how the system will work sequentially. The main reason for doing this project was to make it easier at the industry level where different organizations waste a lot of time and manpower in micro tasks. Hopefully this system will be able to execute every micro calculation, maintenance of the database, generating survey reports of an organization remotely and within a short period of time.