**Object Oriented Analysis and Design**

**Automated Bill Payment System**

**Project Deliverable 2**

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**Automated Bill payments Application**

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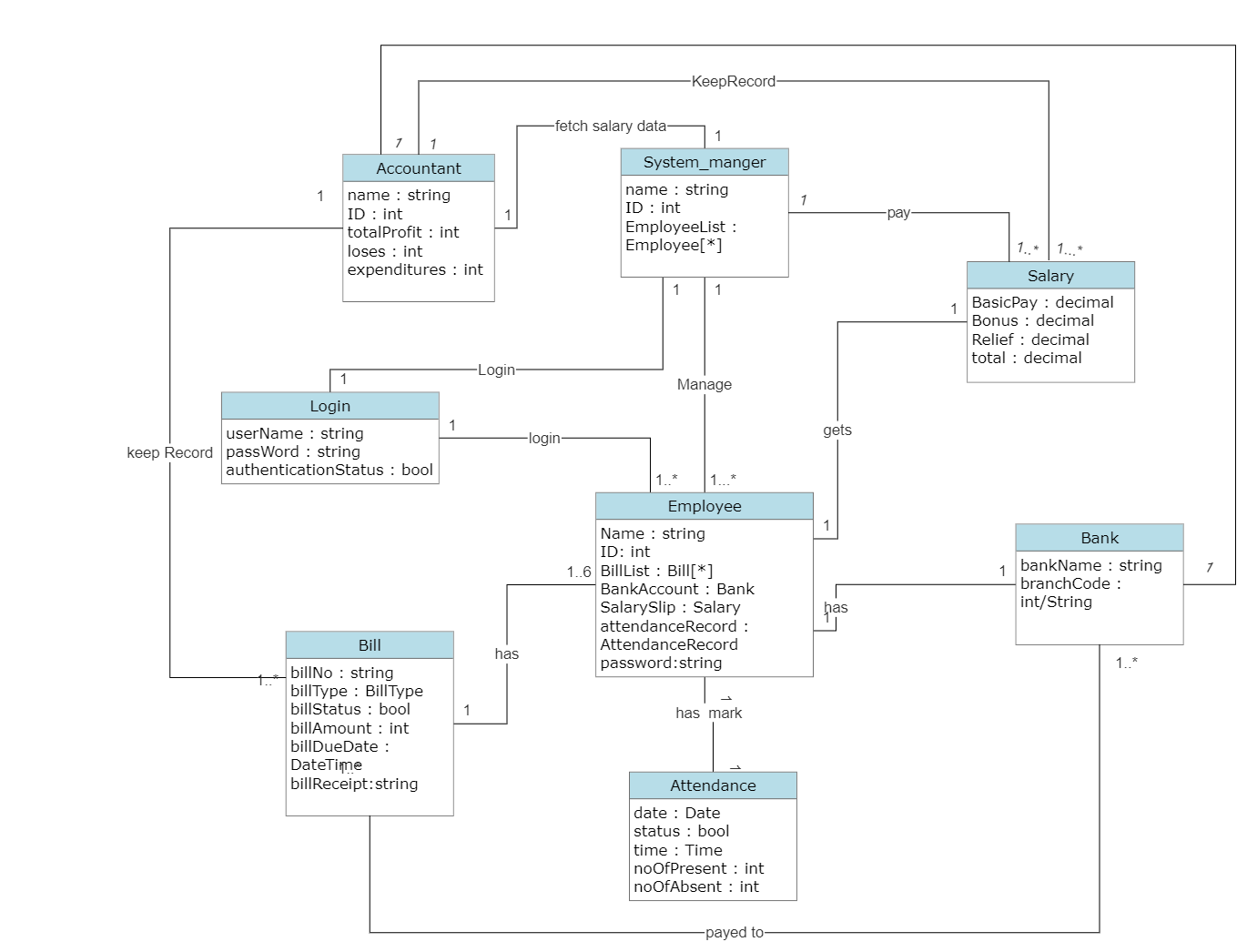
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\*All the diagrams in this document are created on smartdraw.com

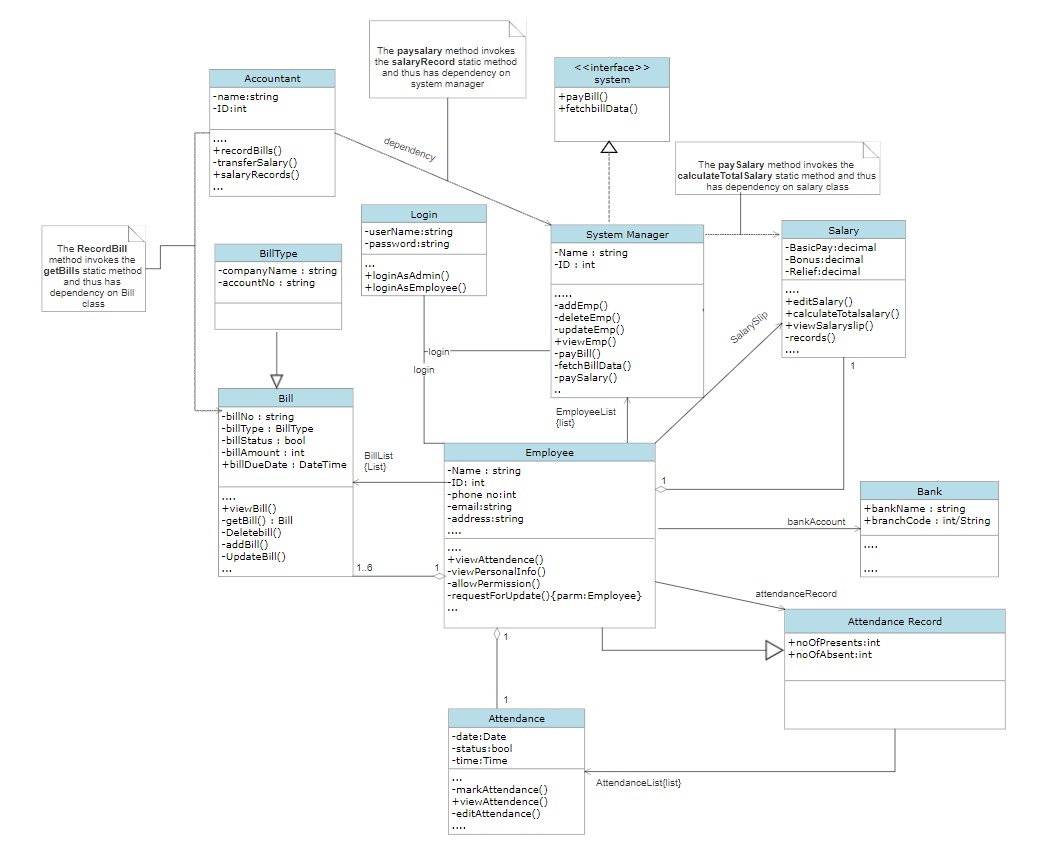
**Domain Model**

(Visual representation of conceptual classes of Automated Bill payment System)

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**Design Class Diagram**

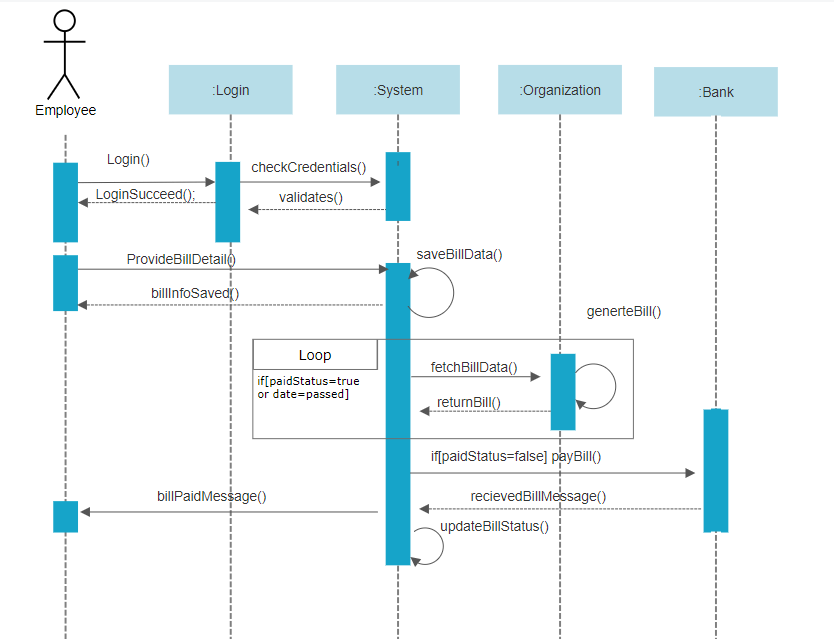
**(Detailed Visual Representation of system class and their relationships)**

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**Sequence Diagram**

**(Sequence flow of bill payment among different states)**

* Employee with add bill information once and system will then automatically fetch data from organization site, check status and performs accordingly.

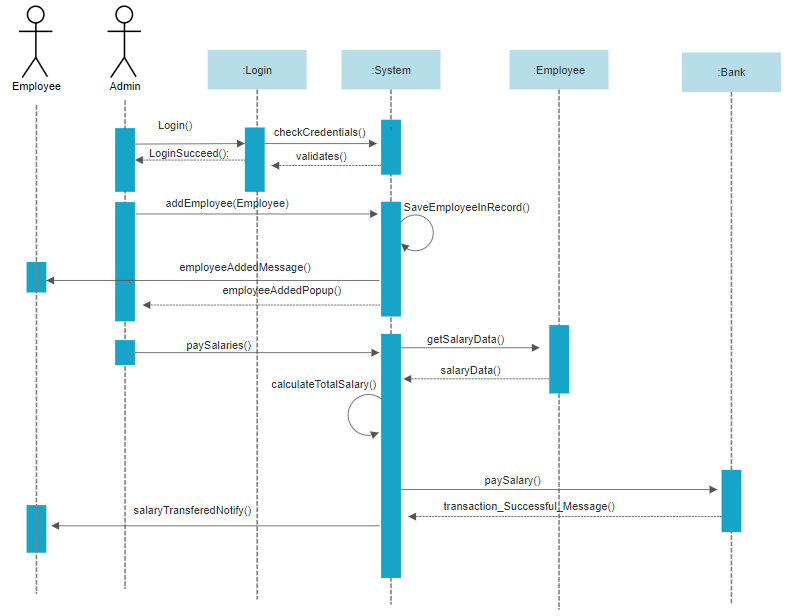


\*We can have multiple actors in a Sequence Diagram

Source: https://www.geeksforgeeks.org/unified-modeling-language-uml-sequence-diagrams/

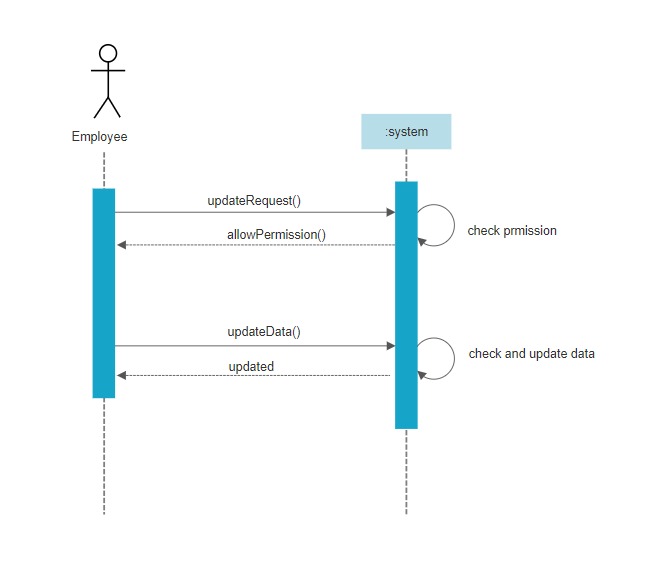
**(Sequence flow of login to add employee and then paying salaries to employees among different states of admin)**

* Admin will login and add employee to employee list then admin will pay salaries to all existing employee. System will calculate salary of each employee after checking employee salary data. Bills will be deducted from salary

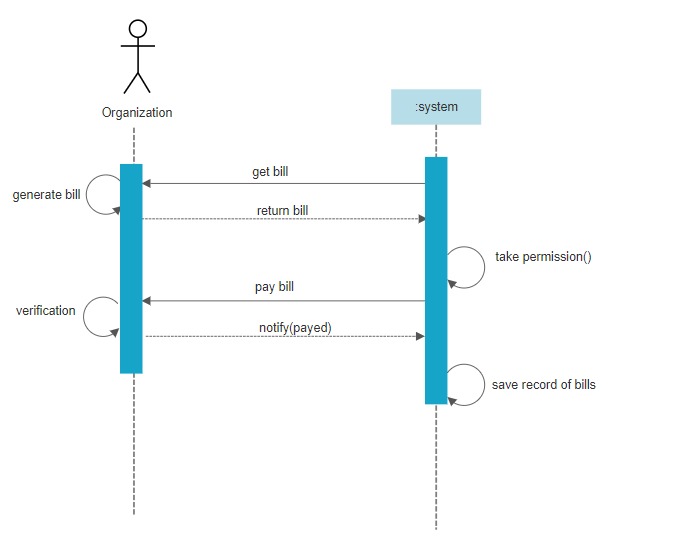


**System Sequence Diagrams**

**(System Sequence Flow of Risk Management Use Case)**

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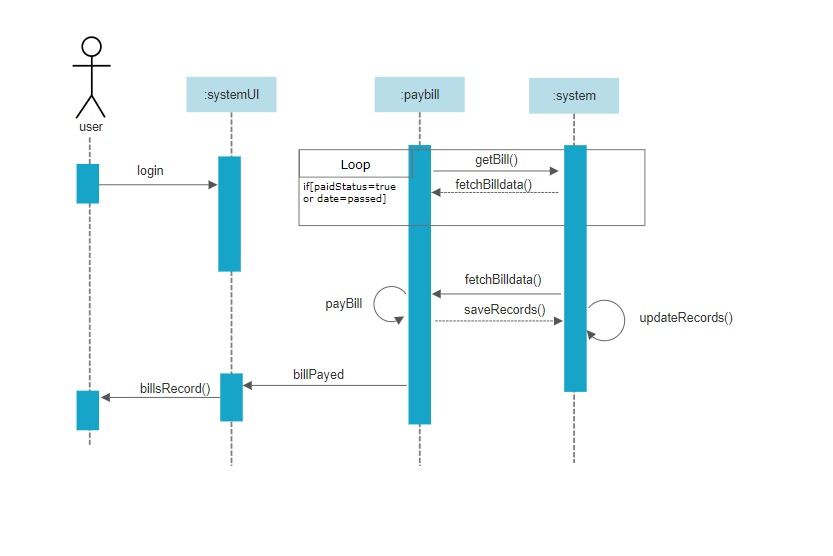
**(System Sequence Flow of Business Management Use Case)**



**(System Sequence Diagram of Architecture)**

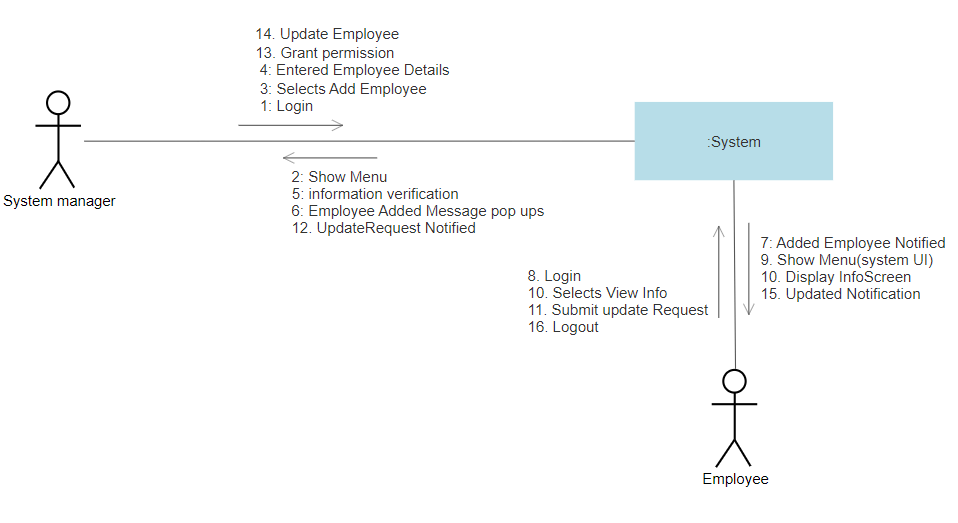
**Here system is divided into three parts**

* **Model**
* **View**
* **Controller**

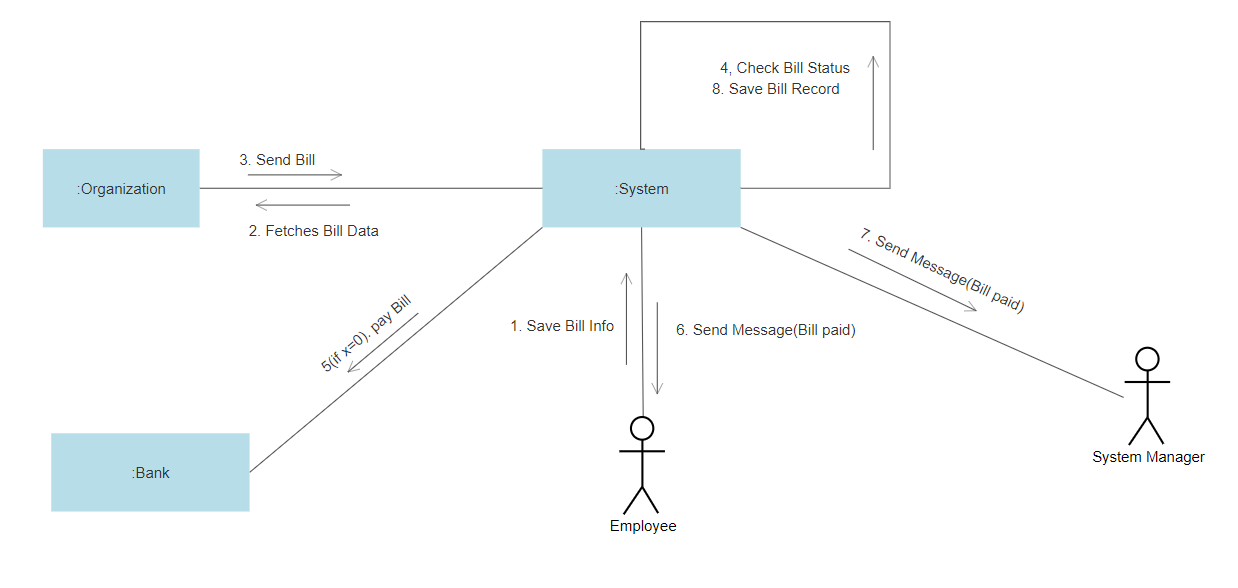


**Collaboration Diagram**

**(Risk Use Case- Update Permission and Employee update Request)**

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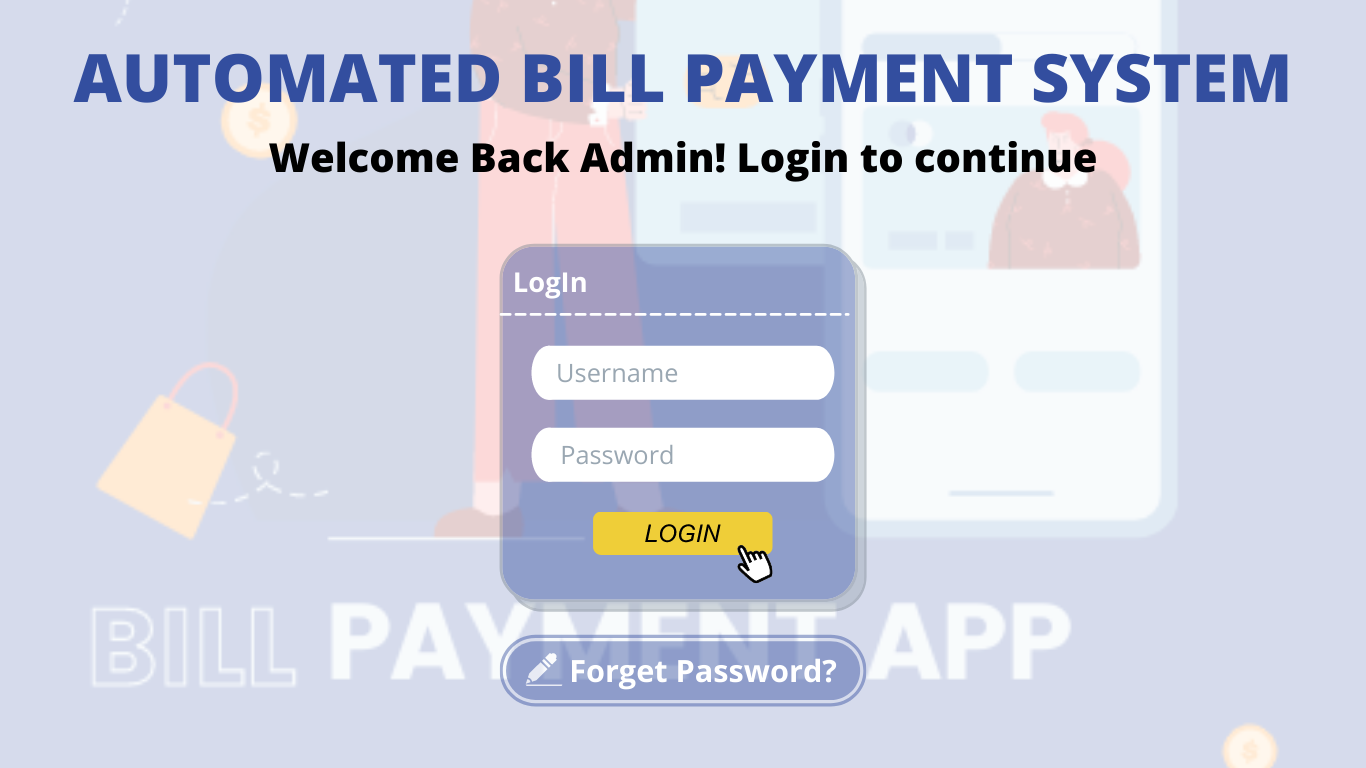
**(Pay Bills and Save Record)**

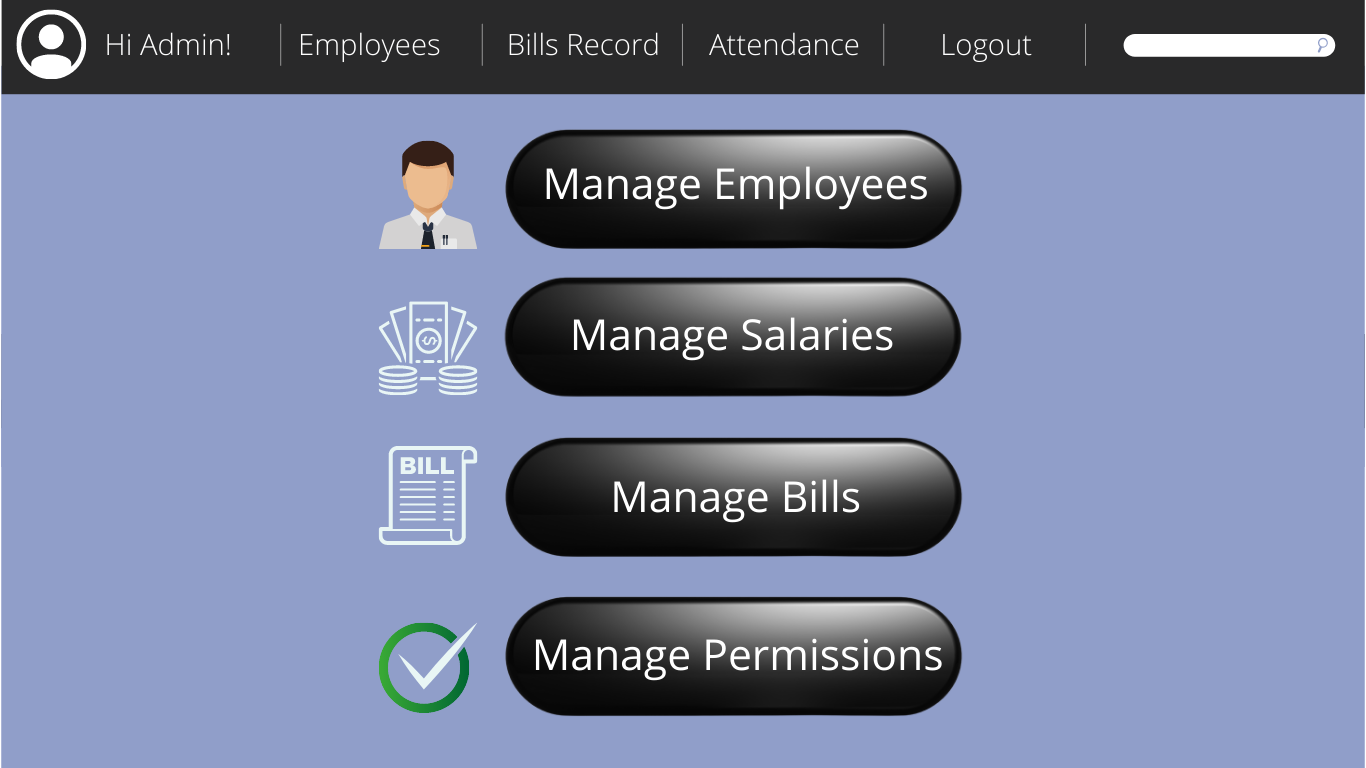
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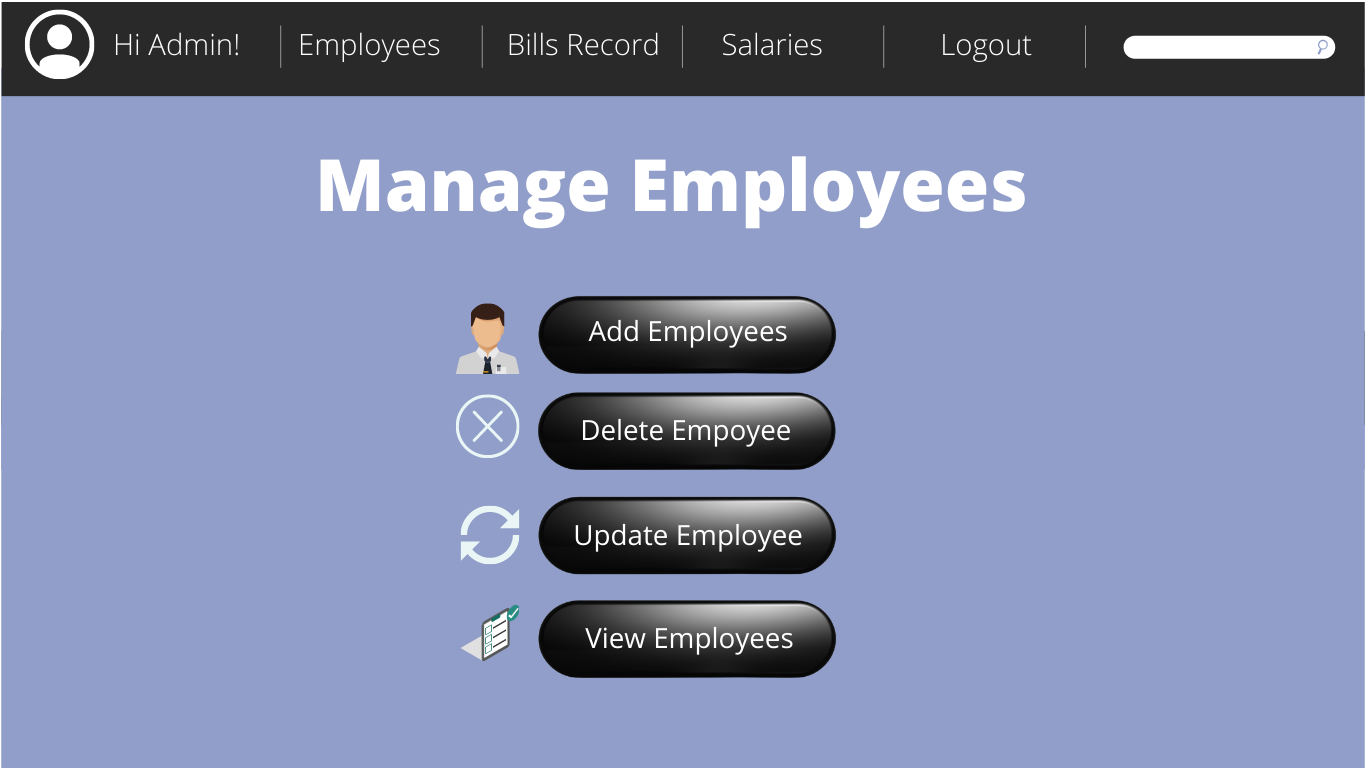
* In message 5 : x means Bill Status and Date and 0 means false

**Prototype’s**

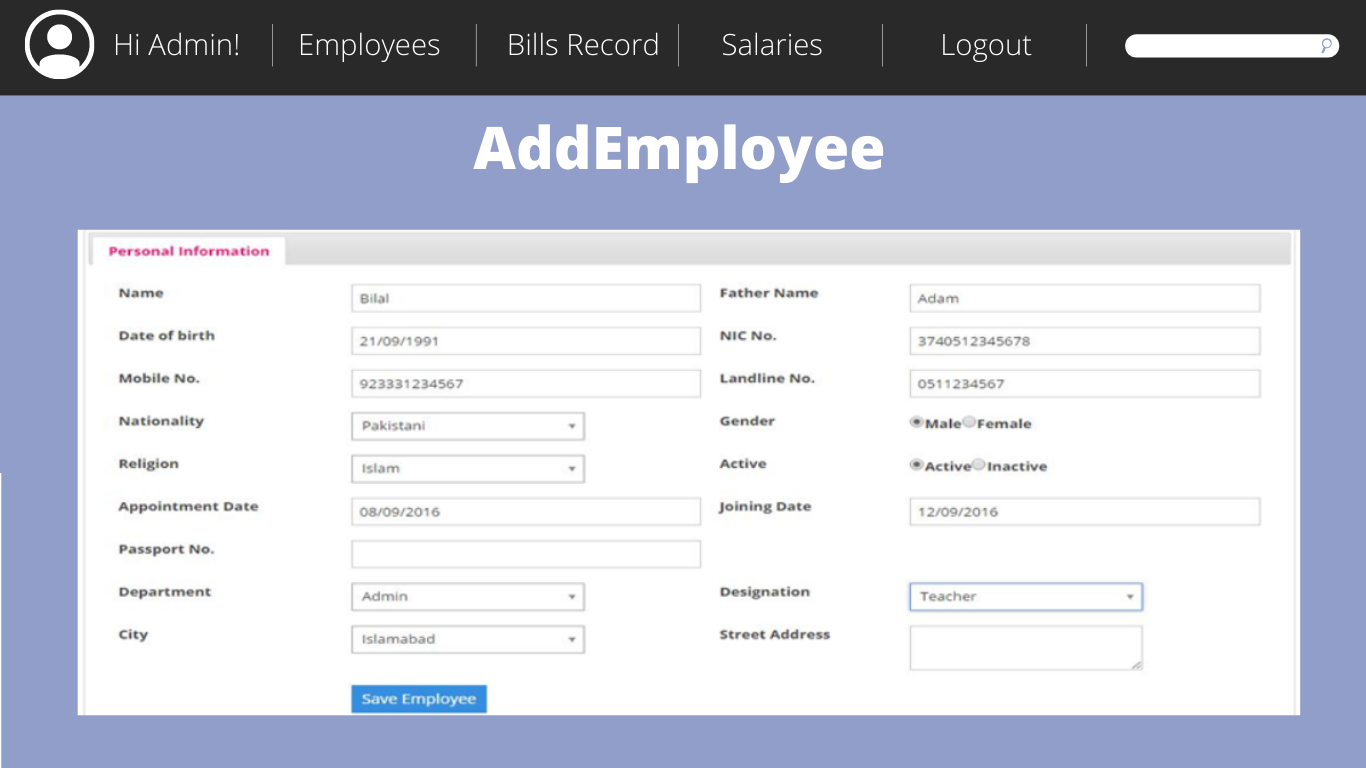
* **Admin End UI:**

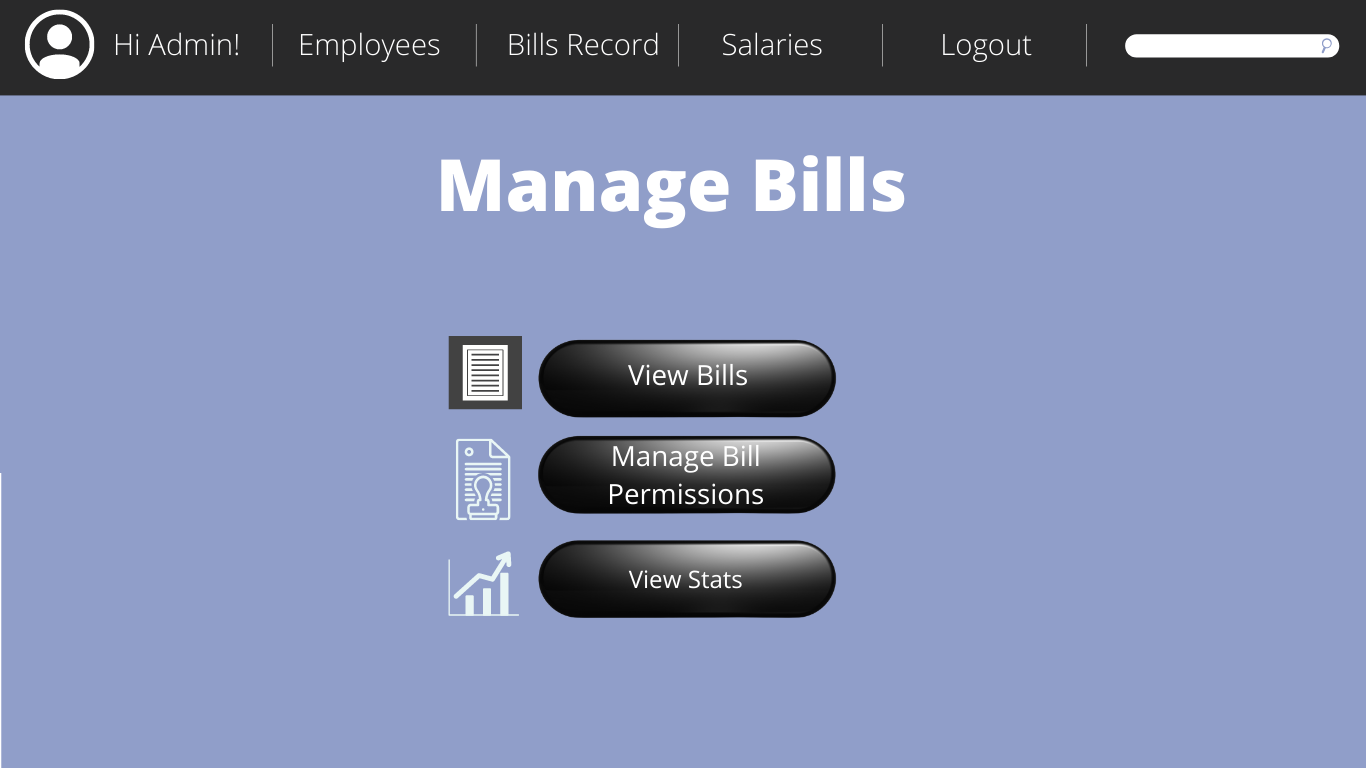
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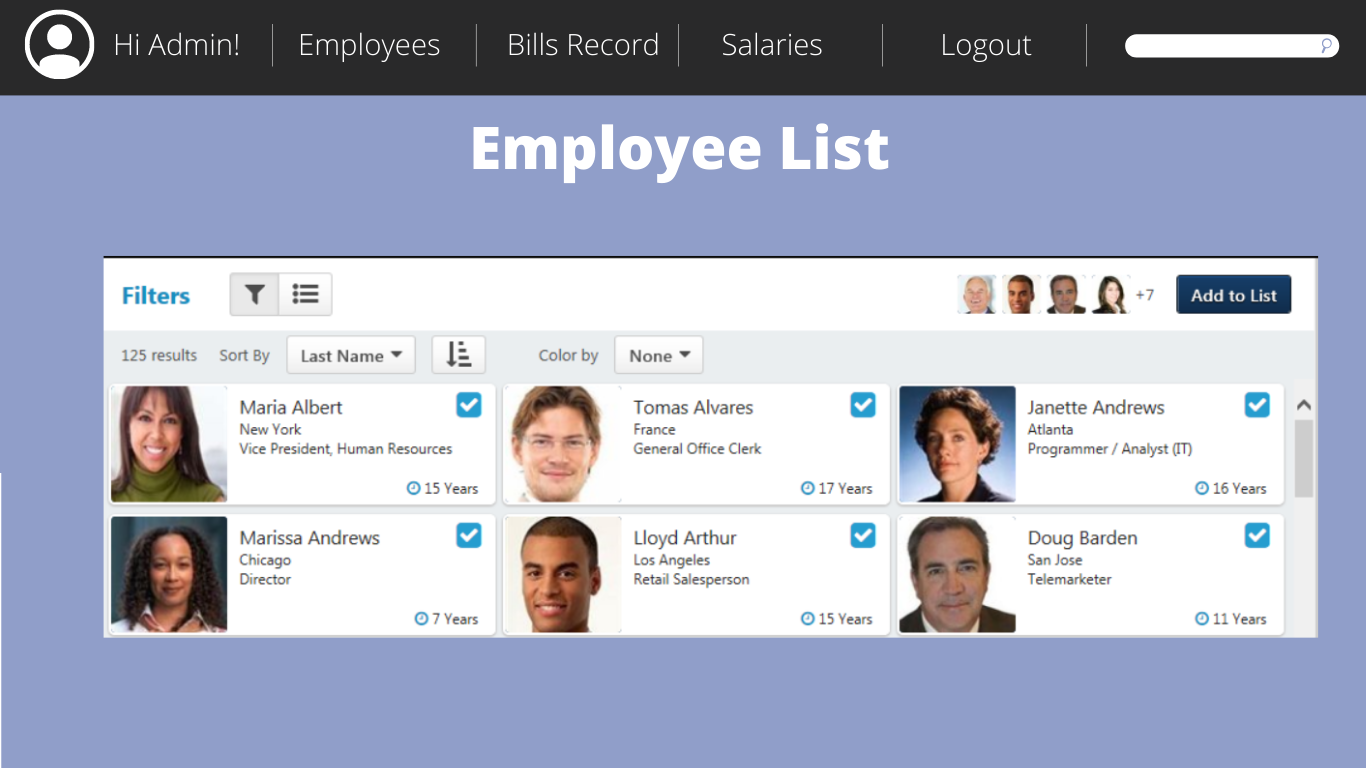
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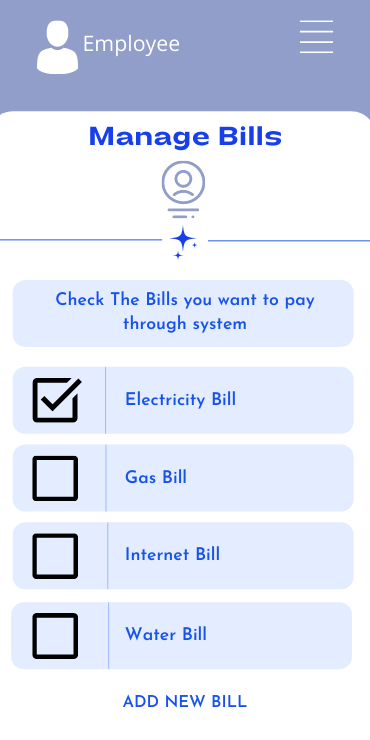
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* Employee End UI:

|  |  |
| --- | --- |
|  |  |
|  |  |



**USE CASE CONTRACTS**

1. **Contract #1:**

|  |  |
| --- | --- |
| Operation: | PayBill(Bill\_Id: Bill\_Id, Amount: integer) |
| Cross References: | Use Case- Bill Payment |
| Pre-Condition: | The data is fetched from the billing service |
| Post Condition: | * PayBill instance p was created. * p is associated with BillRecord. * p.Bill\_Id becomes Bill\_Id. * Based on the Bill\_Id, the bill is paid. |

1. **Contract #2:**

|  |  |
| --- | --- |
| Operation: | AllowPermission(GrantPermission:GrantPermis sion) |
| Cross References: | Use Case- Manage Employee Permission |
| Pre-Condition: | Employee has logged in and, on the panel, to either check mark or not. |
| Post Condition: | * An instance of Employee e is created. * Instance e is associated with System Manager. * If an employee marks yes which displays the information on UI. |

1. **Contract #3:**

|  |  |
| --- | --- |
| Operation: | LoginEmployee(Username:string, Password:string) |
| Cross References: | Use Case- Login |
| Pre-Condition: | Employee has to visit the app, and enter the login credentials. |
| Post Condition: | * An Employee e instance is created. * If the credentials match with the record, the user is logged in. * If credentials fail to match, an instance f is called that says forget password notification. |

1. **Contract #4**

|  |  |
| --- | --- |
| Operation: | ViewEmpInfo(DisplayInfo:DisplayInfo) |
| Cross References: | Use Case- View Employee Information |
| Pre-Condition: | User is logged as employee e into the app and able to click on the view information button. |
| Post Condition: | * e.DisplayInfo is called. * UI is displayed to the user with all his information. |

1. **Contract #5**

|  |  |
| --- | --- |
| Operation: | SendUpdateRequest(EmpInfo:Empinfo) |
| Cross References: | Use Case- Update Request |
| Pre-Condition: | Employee is logged in to the app and is on UI where he can view information. |
| Post Condition: | * An instance manager m is created. * Employee is associated with the system manager. * .EmployeeInfo is called. * If an employee's information needs updating, a request will be sent to the admin panel. |

1. **Contract #6**

|  |  |
| --- | --- |
| Operation: | UpdateInfo() |
| Cross References: | Update Employee Information |
| Pre-Condition: | Employee’s information update requests have been received to the admin panel (one who has logged in as employee. |
| Post Condition: | * An instance employee e is created * Instance e.employeeInfo is associated with the manager. * If an update request is received, the admin updates the employees information. |

1. **Contract #7**

|  |  |
| --- | --- |
| Operation: | PaySalary(EmployeeSalary:EmployeeSalary, Amount: Integer) |
| Cross References: | Use Case- Salary Details |
| Pre-Condition: | Admin is logged in to the system to pay salary to the employees. |
| Post Condition: | * Instance salary p is already created. * A function that calculates the net salary is called. * p.EmployeeSalary becomes EmployeeSalary * Net salary is transferred to the employee’s bank. |

1. **Contract #8**

|  |  |
| --- | --- |
| Operation: | ViewAttendance(Attendances:Attendances, Absents:Integer, NoOfDays: Integer) |
| Cross References: | Use Case- View Attendance |
| Pre-Condition: | Employee is logged in to the system and clicks on View Attendance button to see his attendance record. |
| Post Condition: | * An instance employee e is created. * e.Attendance is associate with Attendances * Attendance record is displayed. |

1. **Contract #9**

|  |  |
| --- | --- |
| Operation: | MarkLeave(Leave:Leave, No\_ofAttendances:Integer) |
| Cross References: | Use Case- Attendance System |
| Pre-Condition: | Employee is on panel/page to mark leave. |
| Post Condition: | * An instance employee e is already created. * It is associated with Leave. * A request is sent to the admin to either mark leave or decline. |

1. **Contract #9**

|  |  |
| --- | --- |
| Operation: | BillRecords() |
| Cross References: | Use Case- update Bill Records |
| Pre-Condition: | Manager is logged in to the system and clicks on the update bill Records button to update records. |
| Post Condition: | * An instance employee e is created. * e.updatebill is associated with billRecord . * Updated record stored in system. |

**References**

* <https://www.geeksforgeeks.org/unified-modeling-language-uml-sequence-diagrams/>
* <https://creately.com/blog/diagrams/sequence-diagram-tutorial/>
* <https://searchsoftwarequality.techtarget.com/definition/collaboration-diagram#:~:text=A%20collaboration%20diagram%2C%20also%20known,the%20role%20of%20each%20object>.