

## Table of Contents

Revision History	3
Document Approval	3
1. Introduction	7
1.1 Purpose	7
1.2 Scope	7
1.3 Definitions, Acronyms, and Abbreviations	7
1.4 References	7
1.5 Overview	8
2. General Description	8
2.1 Product Functions	8
2.2 User Characteristics	8
3. Specific Requirements	9
3.1 External Interface Requirements	9
3.2 Functional Requirements	9
3.2.1 The system shall allow employees to submit timecards.	9
3.2.2 The system shall allow the employees to provide the number of hours worked for a particular workload in the timecard (no more than 8 hours daily for hourly employees).	9
3.2.3 The system shall generate a paycheck for hourly employees every Friday based on hourly rate and their worked hours.	9
3.2.4 The system shall keep track of each timecard start and end date.	9
3.2.5 The system shall allow employees and administrator to log in using their email address and password.	9
3.2.6 The system shall allow performance employees to add purchase orders using the date, purchased products, amount of the sale, customer point of contact and costumer's billing address.	10
3.2.7 The system shall generate a unique purchase order number for each purchase order that is added in FR 3.2.6	10
3.2.8 The system shall assign a commission rate for each performance employee based on their sales.	10
3.2.9 The system shall calculate the commission amount for the performance employees based on the commission rate and purchase order amount in FR 3.2.8.	10
3.2.10 The system shall generate a paycheck for Salaried employees on the last working day of the month (add commission amount for performance employee).	10

3.2.11 The system shall allow the performance employee to change purchase order information.	11
3.2.12 The system shall allow the performance employee to cancel a purchase order by providing the purchase order number.	11
3.2.13 The system shall display the timecard of the current pay period.	11
3.2.14 The system shall allow the employee to request a report.	11
3.2.15 The system shall allow employees to print a report in FR 3.2.14	11
3.2.16 The system shall allow employees to choose their payment method by either direct deposit into a specific bank account or directly picking their paycheck up at the office.	12
3.2.17 The system shall allow the Administrator to add employees by providing name, social security number, phone number, payment classification (hourly, salaried, performance), salary (for salaried and performance employees), hourly rate (for hourly employees), tax deductions.	12
3.2.18 The system shall allow the Administrator to delete an employee by providing his name and social security number.	12
3.2.19 The system shall allow the payroll Administrator to change an employee's information.	12
3.2.20 The system shall allow the Administrator to request a report about total hours worked or Pay Year-to-Date by providing employee name, beginning and end dates for the report.	12
3.3 Use Cases	13
3.3.1 Use case diagram	13
3.3.2 Table of use cases	14
3.4 Use Cases Description	15
3.4.1 Use Case #1	15
3.4.2 Use Case #2	16
3.4.3 Use Case #3	17
3.4.4 Use Case #4	18
3.4.5 Use Case #5	19
3.6 Non-Functional Requirements	20
3.6.1 Performance	20
3.6.2 Reliability	20
3.6.3 Availability	20
3.6.4 Security	20
3.6.5 Maintainability	20

3.6.6 Portability	20
3.7 Design Constraints	20
3.8 Other Requirements	20
4. Analysis Models	21
4.1 Sequence Diagrams and Mockup Screens	21
4.2 Activity Diagrams	30
5 Classes / Objects	32
5.1 Class diagram	32
5.2 Employee	33
5.3 HourlyEmployee	33
5.4 PerformanceEmployee	33
5.5 SalariedEmployee	34
5.6 Timecard	34
5.7 PurchaseOrder	34
5.8 PurchasedProduct	35
5.9 PaymentMethod	35
A. Appendices	36
A.1 Appendix 1	36
A.2 Appendix 2	36

# **1. Introduction**

## **1.1 Purpose**

The purpose of this document is to develop a payroll management system which replaces the old system and pay the employees their salaries and keep track of their performance, this document is intended for designers.

## **1.2 Scope**

The new system shall allow employees to record timecard information electronically and automatically generate paychecks, The system will allow employees to submit timecards, enter purchase orders and create various reports, The system will ensure that employees are paid based on their categorization.

## **1.3 Definitions, Acronyms, and Abbreviations**

- Payroll Administrator: The person responsible for maintaining employees and employee information in the system.
- Employee: A person who works for PayNow.
- Bank System: Any bank to which deposit transactions are sent.
- System Clock: The system clock which automatically runs the payroll at the appropriate times.
- Pay Period: The amount of time over which an employee is paid.
- Paycheck: A record of how much an employee was paid during a specified Pay Period.
- Payment Method: How the employee is paid, either direct deposit, or pick-up.
- Timecard: A record of hours worked by the employee during a specified pay period.
- Purchase Order: A record of a sale made by an employee.
- Salaried Employee: An employee that receives a salary.
- Performance Employee: An employee that receives a salary plus commissions.

## **1.4 References**

The IEEE Guide to Software Requirements Specification (ANSI/IEEE Std. 830-1984).

The SRS templates of Dr. Orest Pilskalns (WSU, Vancouver) and Jack Hagemeister (WSU, Pullman) have also been used as guides in developing this template for the SWE 312 course.

## **1.5 Overview**

This document contains a description of all functional and nonfunctional requirements, a use case diagram, five use cases descriptions, and design constraints of the new payroll management system.

## **2. General Description**

### **2.1 Product Functions**

The system will allow employees to enter timecard information, submit timecards, change payment method, enter purchase orders for performance employees, The system will allow administrators to add or delete employees, change employee's information, The system will generate paychecks automatically based on the employee categorization, The system will also allow employees and administrators to generate various reports based on specified criteria.

### **2.2 User Characteristics**

Primarily, employees and payroll administrators are the intended users, and no advanced technical expertise is necessary.

### **3. Specific Requirements**

#### **3.1 External Interface Requirements**

3.1.1 The system shall interface with existing bank systems via an electronic transaction in order to complete the deposit of the generated paychecks.

#### **3.2 Functional Requirements**

**3.2.1 The system shall allow employees to submit timecards.**

Introduction: none.

Inputs: none.

Outputs: none.

**3.2.2 The system shall allow the employees to provide the number of hours worked for a particular workload in the timecard (no more than 8 hours daily for hourly employees).**

Introduction: none.

Inputs: number of worked hours.

Outputs: none.

**3.2.3 The system shall generate a paycheck for hourly employees every Friday based on hourly rate and their worked hours.**

Introduction: none.

Inputs: none.

Outputs: paycheck.

**3.2.4 The system shall keep track of each timecard start and end date.**

Introduction: none.

Inputs: none.

Outputs: none.

**3.2.5 The system shall allow employees and administrator to log in using their email address and password.**

Introduction: none.

Inputs: email, password.

Outputs: none.

**3.2.6 The system shall allow performance employees to add purchase orders using the date, purchased products, amount of the sale, customer point of contact and costumer's billing address.**

Introduction: none.

Inputs: date, purchased products, amount of the sale, customer's point of contact, costumer's billing address.

Outputs: none.

**3.2.7 The system shall generate a unique purchase order number for each purchase order that is added in FR 3.2.6**

Introduction: After each purchase is added the system automatically generate the purchases order number.

Inputs: purchase order.

Outputs: purchase order number.

**3.2.8 The system shall assign a commission rate for each performance employee based on their sales.**

Introduction:

sales that are less than 100 implies a commission rate = 10%

sales that are greater than 100 and less than 200 implies a commission rate = 15%,

sales that are greater than 200 and less than 300 implies a commission rate = 25%,

sales that are greater than 300 implies a commission rate= 35%

Inputs: none.

Outputs: none.

**3.2.9 The system shall calculate the commission amount for the performance employees based on the commission rate and purchase order amount in FR 3.2.8.**

Introduction: none.

Inputs: commission rate and purchase order number.

Outputs: commission amount.

**3.2.10 The system shall generate a paycheck for Salaried employees on the last working day of the month (add commission amount for performance employee).**

Introduction: none.

Inputs: none.

Outputs: paycheck.

**3.2.11 The system shall allow the performance employee to change purchase order information.**

Introduction: none.

Inputs: purchase order number, date, purchased products, amount of the sale, customer point of contact and costumer's billing address.

Outputs: none.

**3.2.12 The system shall allow the performance employee to cancel a purchase order by providing the purchase order number.**

Introduction: none.

Inputs: purchase order number.

Outputs: none

**3.2.13 The system shall display the timecard of the current pay period.**

Introduction: none.

Inputs: none.

Outputs: timecard.

**3.2.14 The system shall allow the employee to request a report.**

Introduction:

There had been "etc." mentioned in the system description in line 6 second page which leads to ambiguity therefore it was removed, and report layout wasn't mentioned in the system description, so a table of 1x3 format assumed such that:

- The first column: is about total hours worked, total hours for a particular project, total pay received year-to-date, or remaining vacation time.
- The second column: begin date.
- The third column: end date.

Inputs: report type, beginning and end date of the report.

Outputs: report.

**3.2.15 The system shall allow employees to print a report in FR 3.2.14**

Introduction: none.

Inputs: report.

Outputs: printed report.



**3.2.16 The system shall allow employees to choose their payment method by either direct deposit into a specific bank account or directly picking their paycheck up at the office.**

Introduction: none.

Inputs: payment method.

Outputs: none.

**3.2.17 The system shall allow the Administrator to add employees by providing name, social security number, phone number, payment classification (hourly, salaried, performance), salary (for salaried and performance employees), hourly rate (for hourly employees), tax deductions.**

Introduction: none.

Inputs: employee name, social security number, phone number, payment classification (hourly, salaried, performance), salary (for salaried and performance employees), hourly rate (for hourly employees), tax deductions.

Outputs: none.

**3.2.18 The system shall allow the Administrator to delete an employee by providing his name and social security number.**

Introduction: Information required to delete an employee was not mentioned, so deleting an employee requires providing a name and social security number was assumed.

Inputs: employee's name, social security number.

Outputs: none.

**3.2.19 The system shall allow the payroll Administrator to change an employee's information.**

Introduction: none.

Inputs: employee name, social security number, phone number, payment classification (hourly, salaried, performance), salary (for salaried and performance employees), hourly rate (for hourly employees), tax deductions.

Outputs: none.

**3.2.20 The system shall allow the Administrator to request a report about total hours worked or Pay Year-to-Date by providing employee name, beginning and end dates for the report.**

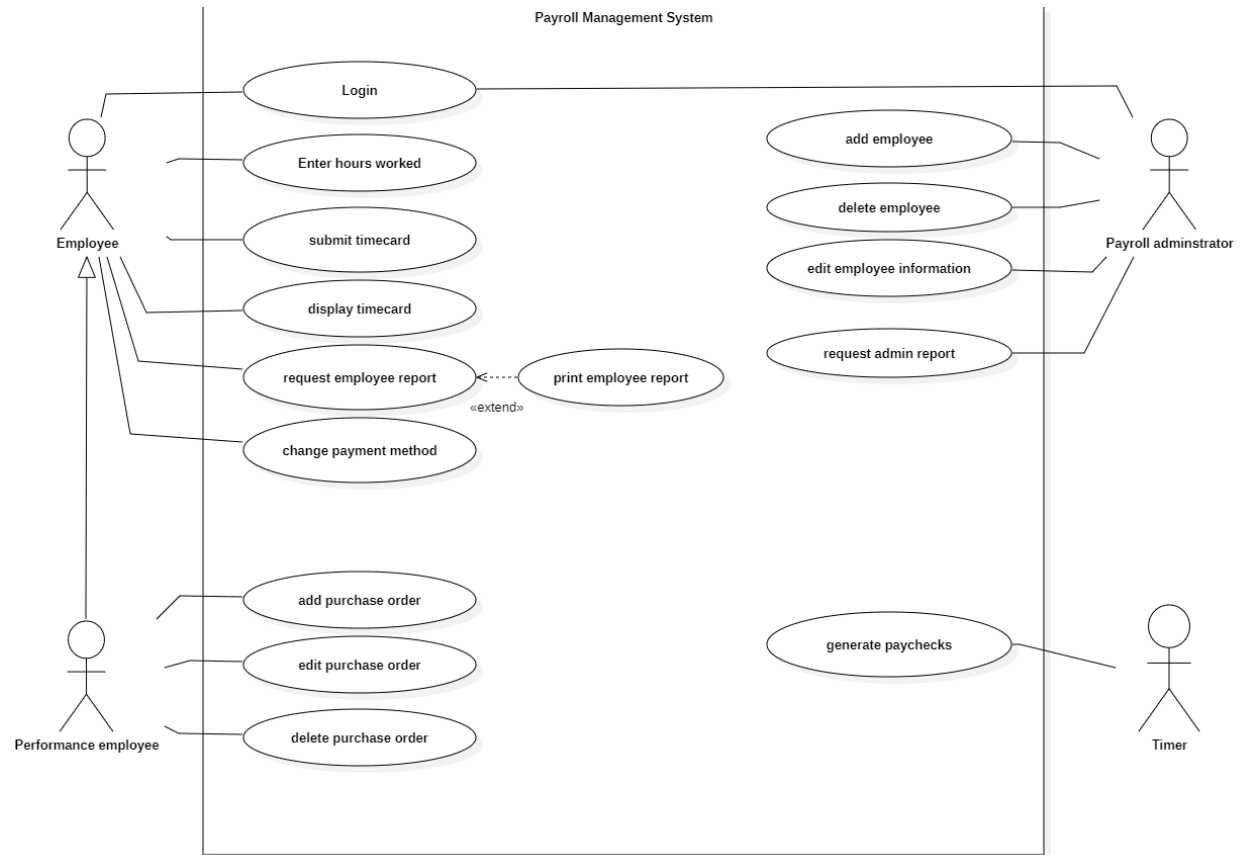
Introduction: none.

Inputs: report type, employee name, beginning and end dates for the report.

Outputs: Administrative report.

### 3.3 Use Cases

#### 3.3.1 Use case diagram



**3.3.2 Table of use cases**

<b>Use case</b>	<b>Actor</b>	<b>Relationships</b>
Login	Employee, Payroll administrator	-
Enter hours worked	Employee	-
Submit timecard	Employee	-
Edit hours worked	Employee	-
Display timecard	Employee	-
Request employee report	Employee	-
Print employee report	Employee	Extends Request employee report
Change payment method	Employee	-
Add purchase order	Performance employee	-
Edit purchase order	Performance employee	-
Delete purchase order	Performance employee	-
Add employee	Payroll administrator	-
Delete employee	Payroll administrator	-
Edit employee information	Payroll administrator	-
Request admin report	Payroll administrator	-
Generate paychecks	Timer	-

### 3.4 Use Cases Description

#### 3.4.1 Use Case #1

Use Case Description	
<b>System:</b> Payroll management system	
<b>Use Case name:</b> Add employee	
<b>Primary actor:</b> Payroll administrator	<b>Other actors:</b>
<b>Stakeholders:</b> Employee	
<b>Description:</b> This use-case allows the administrator to add a new employee	
<b>Relationships-</b> <b>•Includes:</b> - <b>•Extends:</b> -	
<b>Input:</b> employee's name, social security number, phone number, payment classification (hourly, salaried, performance), salary (for salaried employees and performance employees), hourly rate (for hourly employees) and taxes deductions.	
<b>Pre-conditions:</b> The administrator must be logged in to the system.	
<b>Steps:</b>	.
Actor	System
1- The administrator asks the system to add employee. 3- The administrator provides the inputs	2-The system asks the employee to provide: employee's name, social security number, phone number, payment classification (hourly, salaried, performance), salary (for salaried employees and performance employees), hourly rate (for hourly employees) and taxes deductions. 4- The system checks if the employee exists. 5- The system adds the new employee. 6- The system shows a success message.
<b>Alternative and exceptional flows:</b> 4a: Employee already exists. 4.1a: Showing meaningful error message. 4.2a: Return to step two.	
<b>Post-conditions:</b> New employee is added.	

## 3.4.2 Use Case #2

Use Case Description	
<b>System:</b> Payroll management system	
<b>Use Case name:</b> Change payment method	
<b>Primary actor:</b> Employee	<b>Other actors:</b>
<b>Stakeholders:</b> none.	
<b>Description:</b> This use-case allows the employee to change the preferred payment method.	
<b>Relationships-</b> <b>•Includes:</b> - <b>•Extends:</b> -	
<b>Input:</b> Payment method.	
<b>Pre-conditions:</b> The employee must be logged in to the system.	
<b>Steps:</b>	.
Actor	System
1- The employee asks the system to change the payment method. 3- The employee chooses to pick up at the office.	2- The system asks the employee to choose between direct deposit or pick up. 4- The system updates the employee's method. 5- The system displays a success message.
<b>Alternative and exceptional flows:</b> 3a: The employee chooses the direct deposit method. 3.1a: The system asks the employee to provide the IBAN (International Bank Account Number) 3.2a: The employee provides the requested info.	
<b>Post-conditions:</b> Payment method is changed.	

## 3.4.3 Use Case #3

Use Case Description	
<b>System:</b> Payroll management system	
<b>Use Case name:</b> Add purchase order	
<b>Primary actor:</b> Performance employee	<b>Other actors:</b>
<b>Stakeholders:</b> none.	
<b>Description:</b> This use-case allows the performance employee to add a new purchase order.	
<b>Relationships-</b> <b>▪Includes:</b> - <b>▪Extends:</b> -	
<b>Input:</b> Date, purchased products, amount of the sale, customer's point of contact, costumer's billing address.	
<b>Pre-conditions:</b> The performance employee must be logged in to the system.	
<b>Steps:</b>	.
Actor	System
1- The performance employee asks the system to add a new purchase order. 3-The performance employee provides the inputs.	2- The system asks the performance employee to provide: date, purchased products, amount of the sale, customer's point of contact, customer's billing address. 4-The system checks if the provided sale amount is positive. 5- The system assigns a commission rate based on sales. 6-The system generates a unique purchase order number. 7- The system adds the purchase order. 8-The system shows a success message along with the purchase order number.
<b>Alternative and exceptional flows:</b> 4a: The provided input sale amount is negative. 4.1a: system shows an error message. 4.2a: return to 2.	

<b>Post-conditions:</b> New purchase order is stored, and new purchase order number is generated.
---

#### 3.4.4 Use Case #4

Use Case Description	
<b>System:</b> Payroll management system	
<b>Use Case name:</b> Request admin report	
<b>Primary actor:</b> Payroll administrator	<b>Other actors:</b>
<b>Stakeholders:</b> none.	
<b>Description:</b> This use-case allows the payroll administrator to request admin report.	
<b>Relationships-</b> <b>▪Includes:</b> - <b>▪Extends:</b> -	
<b>Input:</b> The type of the report, employees name, beginning and end date for the report.	
<b>Pre-conditions:</b> The payroll administrator must be logged in to the system.	
<b>Steps:</b>	
Actor	System
1-The payroll administrator asks the system for admin report. 3-The payroll administrator provides the inputs.	2-The system asks the administrator to provide: the type of the report, employees name, begin and end date for the report. 4-The system checks whether the employee exists in the system. 5-The system generates the report. 6-The system shows the report.
<b>Alternative and exceptional flows:</b> 4a: the employee doesn't exist in the system. 4.1a: The system shows meaningful error message showing the invalid input. 4.2a: Return to step2.	
<b>Post-conditions:</b> New admin report is generated and displayed.	

## 3.4.5 Use Case #5

Use Case Description	
<b>System:</b> Payroll management system	
<b>Use Case name:</b> Display timecard	
<b>Primary actor:</b> Employee	<b>Other actors:</b> none.
<b>Stakeholders:</b> none.	
<b>Description:</b> This use-case allows the employee to display timecard of the current pay period .	
<b>Relationships</b> <b>•Includes:</b> - <b>•Extends:</b> -	
<b>Input:</b> none.	
<b>Pre-conditions:</b> The employee must be logged in to the system.	
<b>Steps:</b>	.
Actor	System
1- The employee asks the system to display the timecard of the current pay period.	2-The system checks if the timecard of the current pay period exists. 3- The system displays the timecard of the current pay period.
<b>Alternative and exceptional flows:</b> 2a: The timecard does not exist for the current pay period. 2.1a: The system creates a new timecard. 2.2a: Return to step3.	
<b>Post-conditions:</b> The employee timecard is displayed.	



### **3.6 Non-Functional Requirements**

#### **3.6.1 Performance**

3.6.1.1 The system shall simultaneously support 7000 users.

#### **3.6.2 Reliability**

3.6.2.1 The system shall pay the employees by the specified method.

#### **3.6.3 Availability**

3.6.3.1 The system shall be available 98% of the time.

#### **3.6.4 Security**

3.6.4.1 Password shall be required to access the administrator screen.

3.6.4.2 The system shall prevent employees from changing any timecards other than their own.

#### **3.6.5 Maintainability**

None

#### **3.6.6 Portability**

3.6.6.1 The system shall work on mobiles and tablets.

### **3.7 Design Constraints**

3.7.1 The system shall use a mobile phone interface.

3.7.2 The system shall work with the existing Work Management Database without updating the stored information.

### **3.8 Other Requirements**

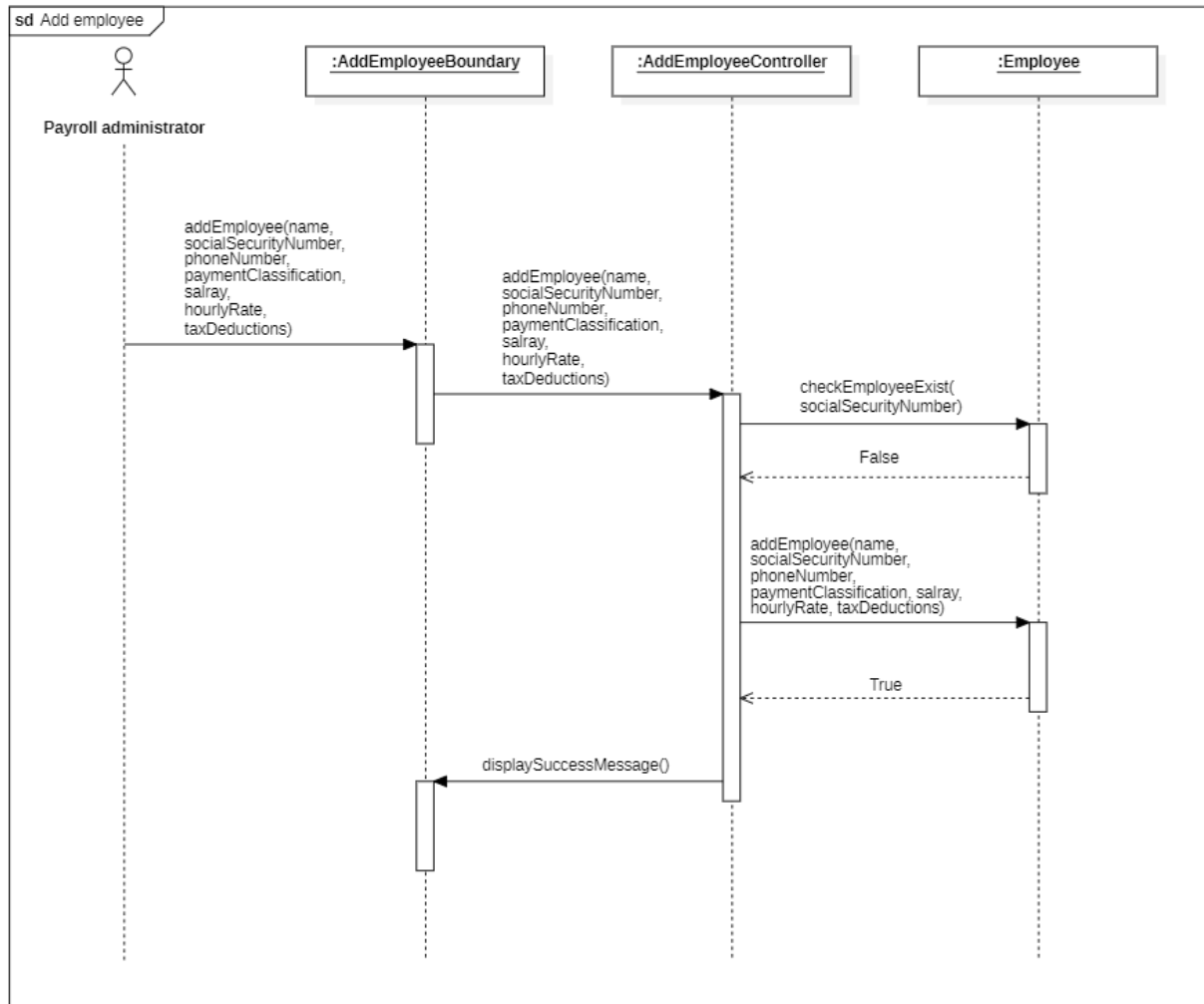
None.

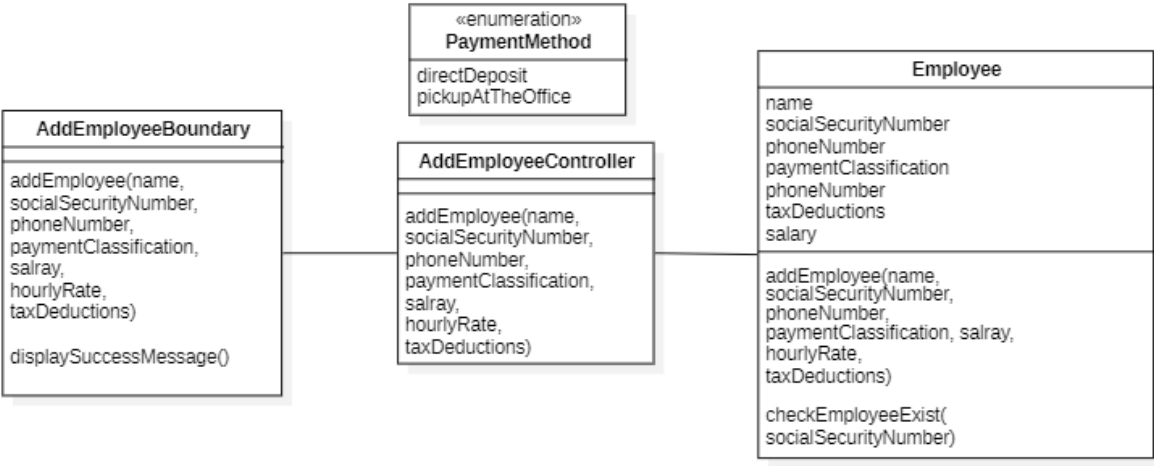
## 4. Analysis Models

### 4.1 Sequence Diagrams and Mockup Screens

#### 4.1.1 Add Employee

Sequence:





Mockup:

Add Employee

←

## Add Employee


**ADD**

Add Employee: message

←

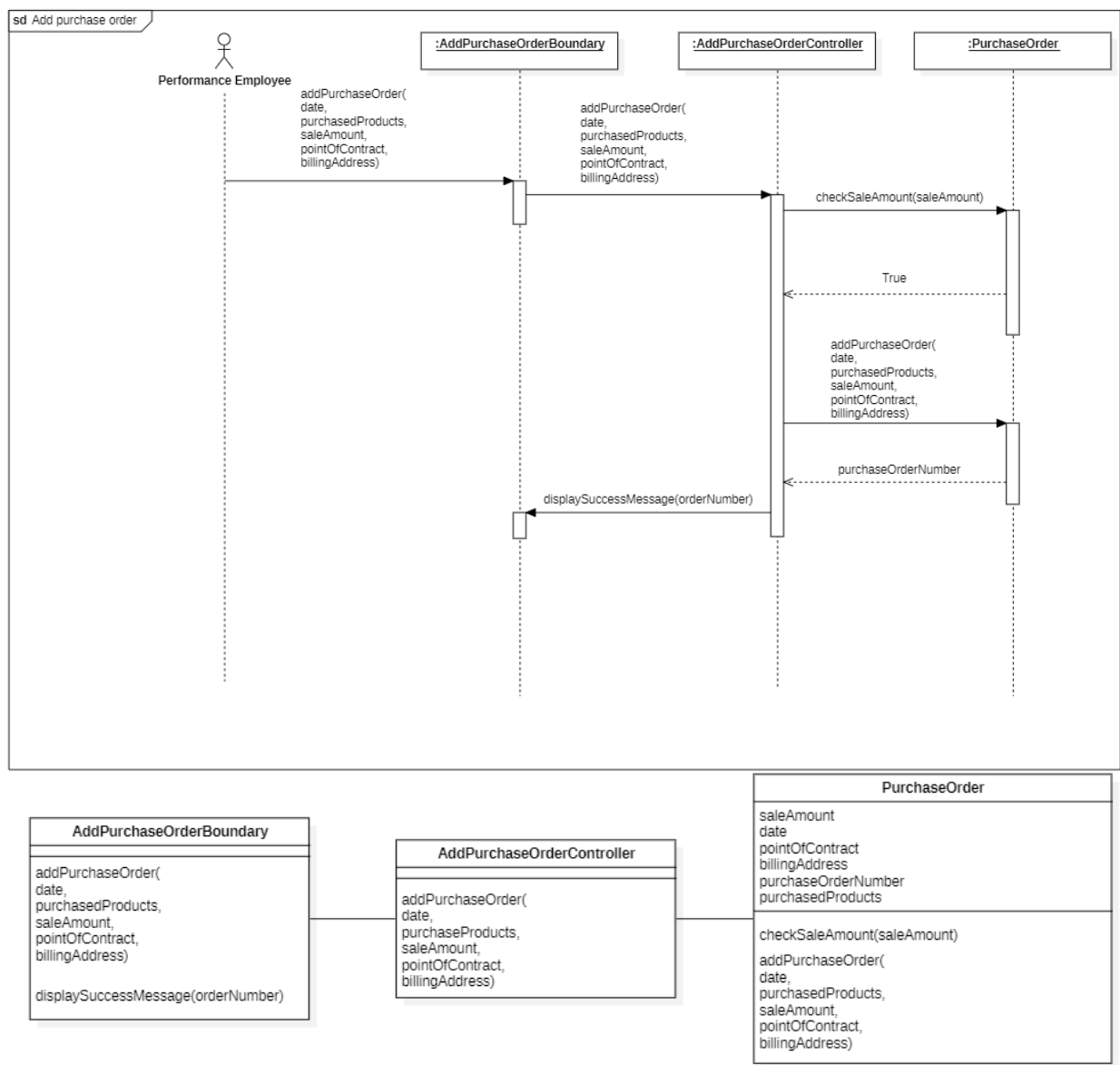
## Add Employee

**ADD**

 Employee added

4.1.2 Add purchase order

Sequence:



Mockup:

Add Purchase order

←

Add purchase order

Date

Purchased Products

Sale Amount

Point of Contract

Billing address

ADD

Add Purchase order: message

←

Add purchase order

Date

Purchased Products

Sale Amount

Point of Contract

Billing address

ADD

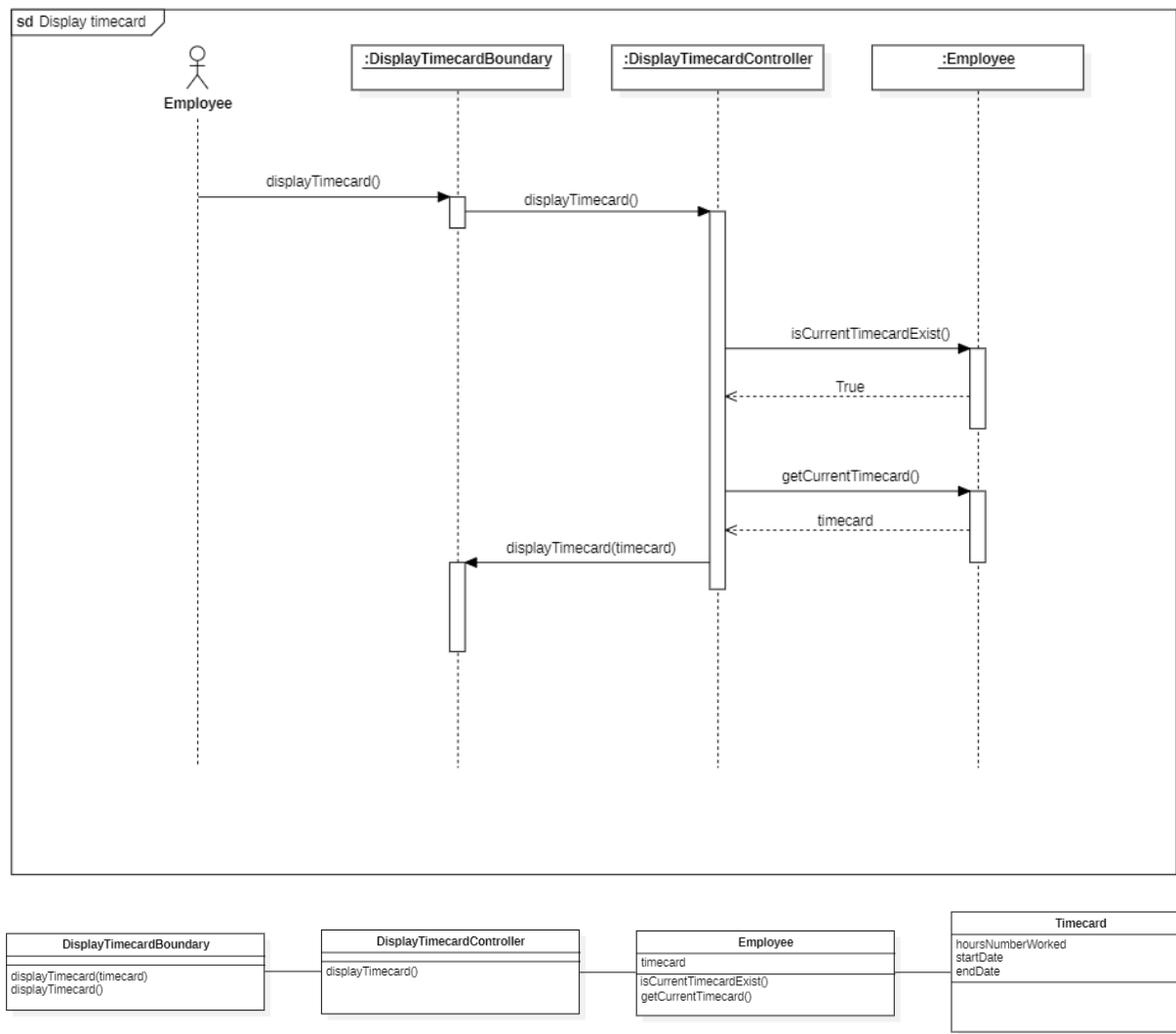
✓✓

Purchase order added

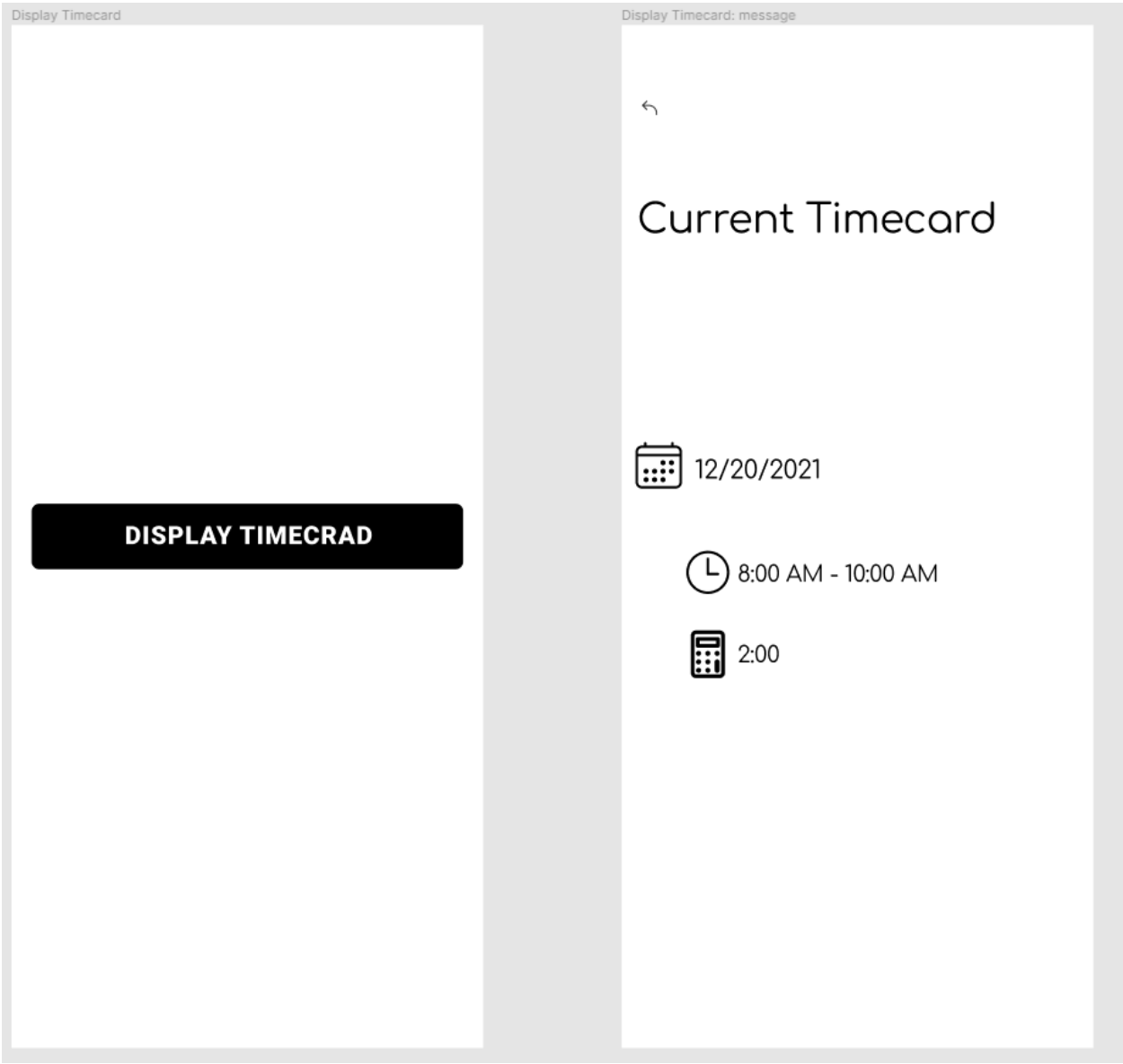
order number: 2382472847

4.1.3 Display Timecard

Sequence:



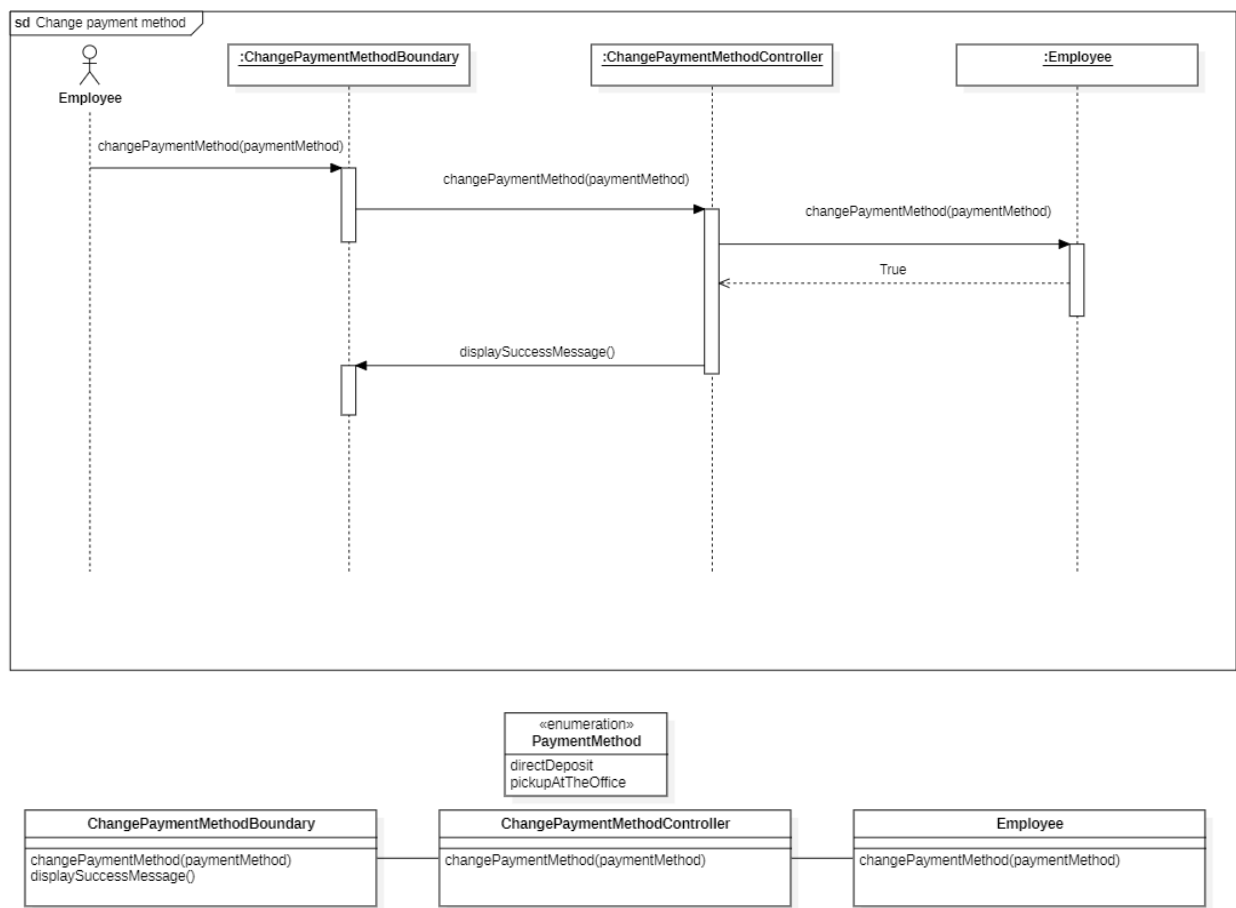
Mockup:



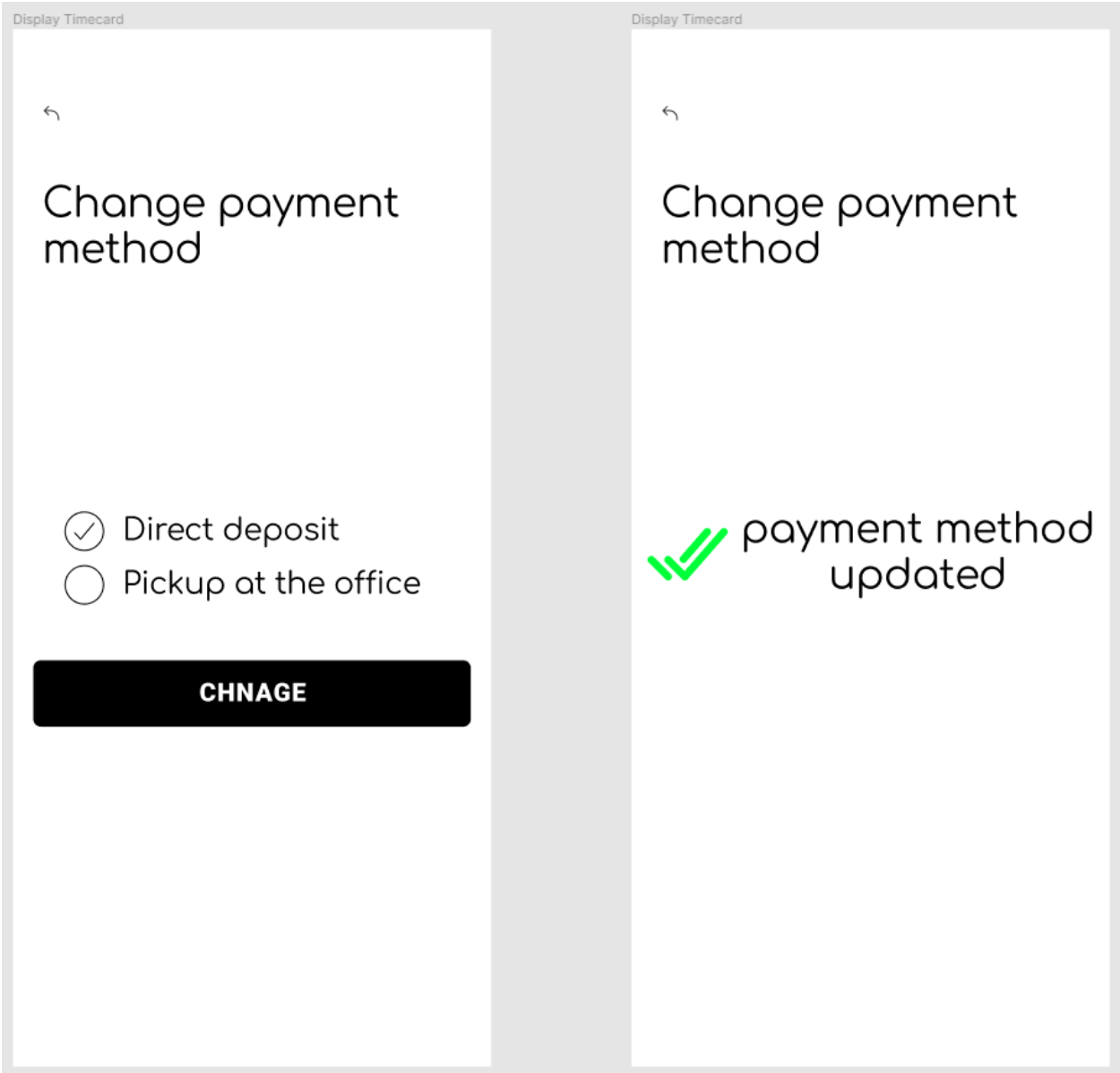


4.1.4 Change payment method

Sequence:

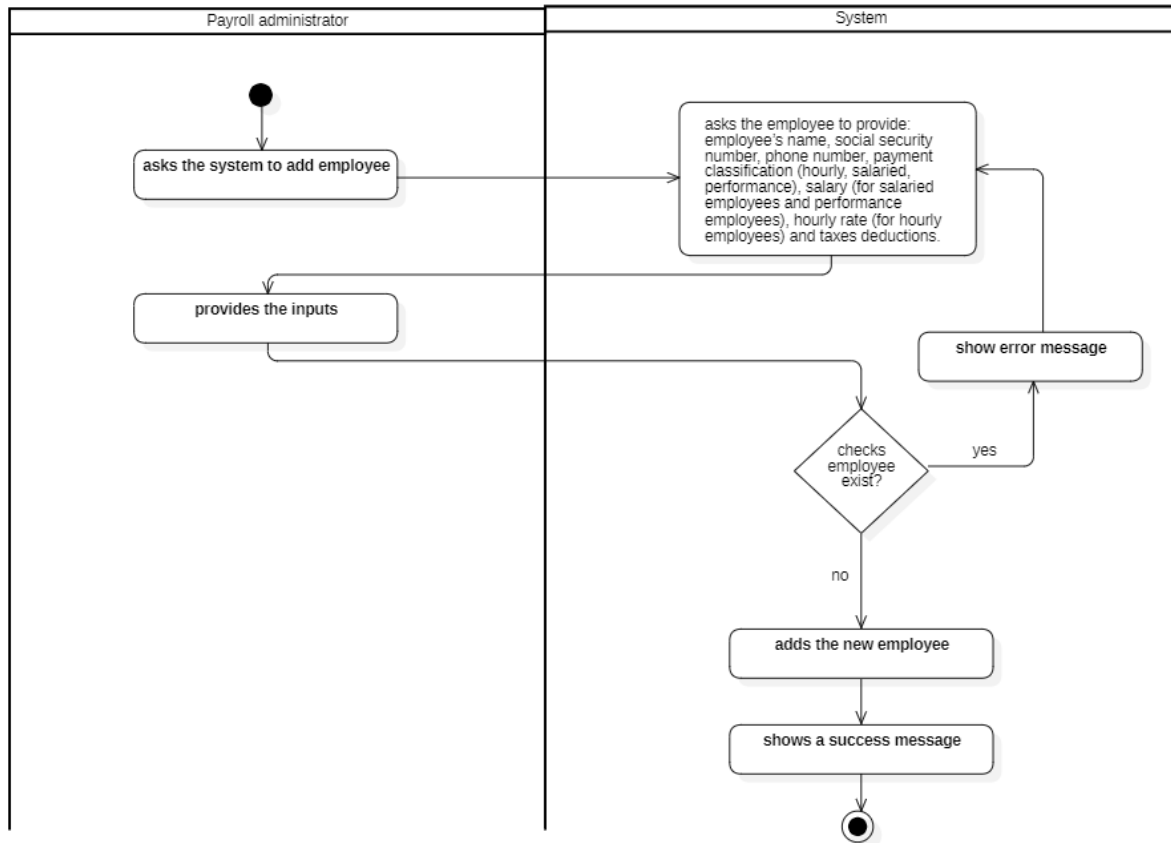


Mockup:

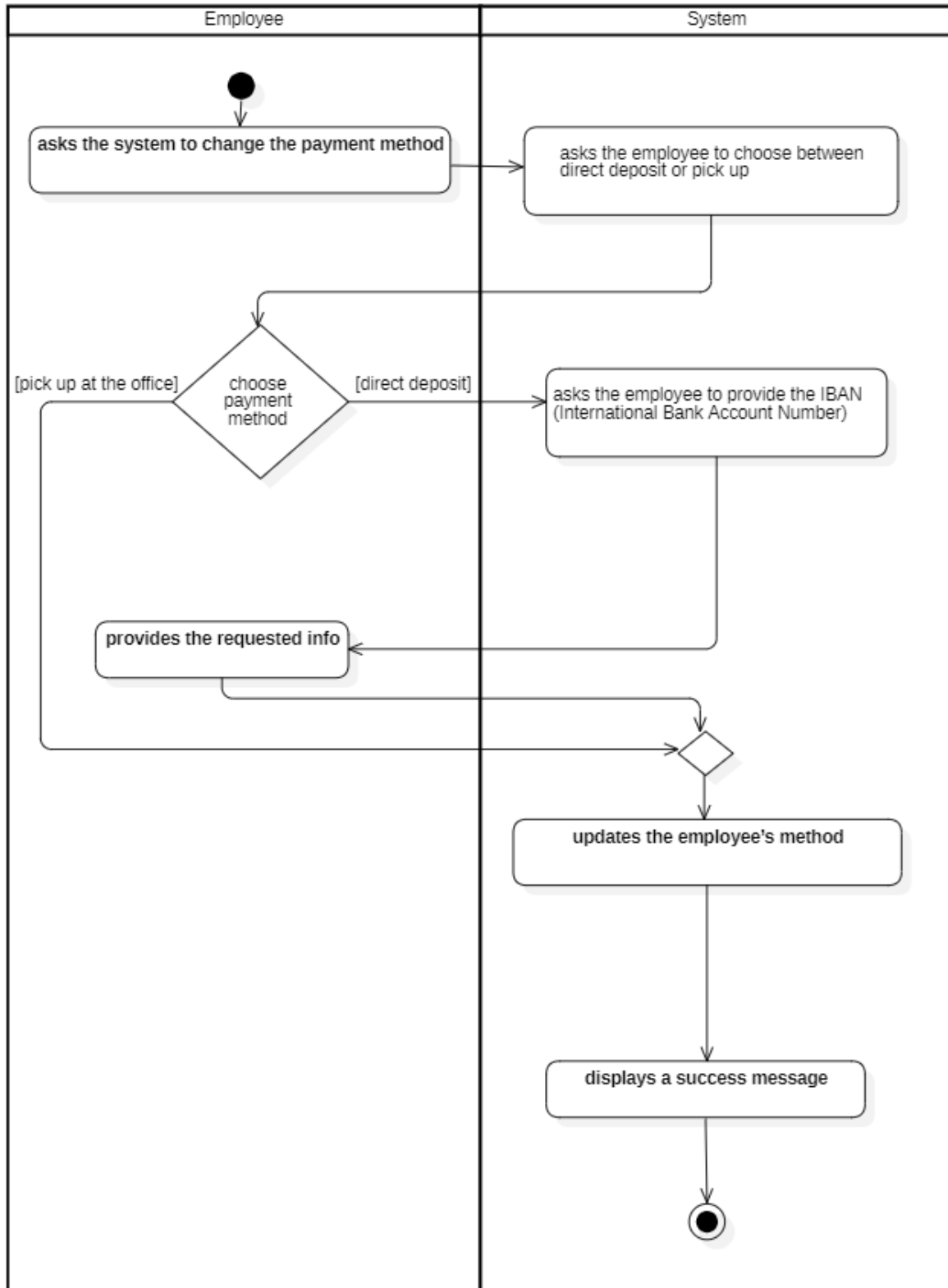


## 4.2 Activity Diagrams

### 4.2.1 Add new employee

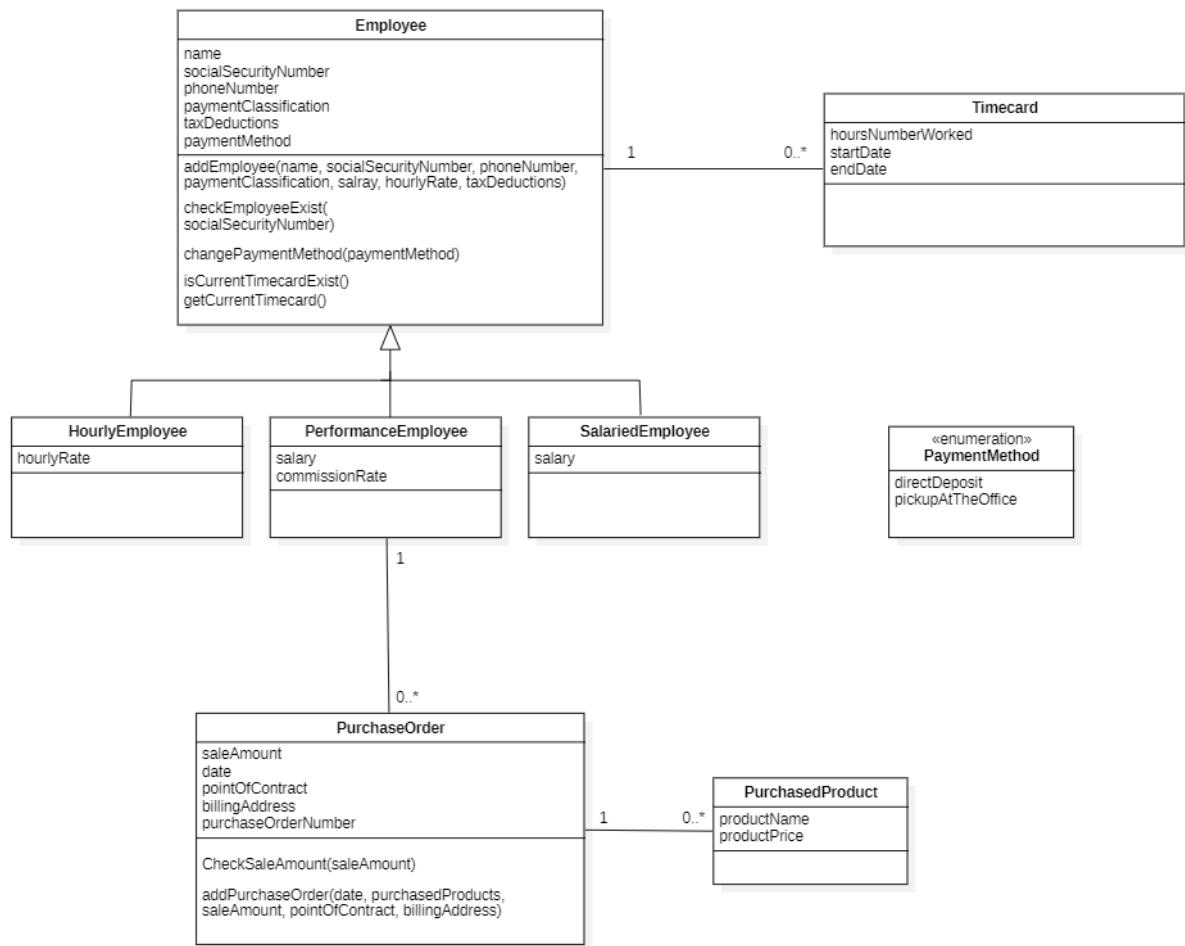


### 4.2.2 Change payment method



5 Classes / Objects

5.1 Class diagram



## **5.2 Employee**

### **5.2.1 Attributes**

- 5.2.1.1 name
- 5.2.1.2 socialSecurityNumber
- 5.2.1.3 phoneNumber
- 5.2.1.4 paymentClassification
- 5.2.1.5 taxDeductions
- 5.2.1.6 paymentMethod

### **5.2.2 Functions**

- 5.2.2.1 addEmployee(name, socialSecurityNumber, phoneNumber, paymentClassification, salary, hourlyRate, taxDeductions)
- 5.2.2.2 checkEmployeeExist(socialSecurityNumber)
- 5.2.2.3 isCurrentTimeCardExist
- 5.2.2.4 changePaymentMethod(paymentMethod)
- 5.2.2.5 getCurrentTimecard

Use case 1, Use case 2, Use case 3, Use case 5

## **5.3 HourlyEmployee**

### **5.3.1 Attributes**

- 5.3.1.1 hourlyRate

### **5.3.2 Functions**

Use case 1, Use case 2, Use case 5

## **5.4 PerformanceEmployee**

### **5.4.1 Attributes**

- 5.4.1.1 salary
- 5.4.1.2 commissionRate

### **5.4.2 Functions**

Use case 1, Use case 2, Use case 3, Use case 5

## **5.5 SalariedEmployee**

### **5.5.1 Attributes**

#### **5.5.1.1 salary**

### **5.5.2 Functions**

Use case 1, Use case 2, Use case 5

## **5.6 Timecard**

### **5.6.1 Attributes**

#### **5.6.1.1 hoursNumberWorked**

#### **5.6.1.2 startDate**

#### **5.6.1.2 endDate**

### **5.6.2 Functions**

Use case 5

## **5.7 PurchaseOrder**

### **5.7.1 Attributes**

#### **5.7.1.1 saleAmount**

#### **5.7.1.2 date**

#### **5.7.1.3 pointOfContract**

#### **5.7.1.4 billingAddress**

#### **5.7.1.5 purchaseOrderNumber**

### **5.7.2 Functions**

#### **5.7.2.1 checkSaleAmount(saleAmount)**

#### **5.7.2.2 addPurchaseOrder(purchasedProducts, saleAmount, date, pointOfContract, billingAddress)**

Use case 3

## **5.8 PurchasedProduct**

### 5.8.1 Attributes

5.8.1.1 productName

5.8.1.2 productPrice

Use case 3

## **5.9 PaymentMethod**

### 5.9.1 Enumeration Literal

5.9.1.1 directDeposit

5.9.1.2 pickupAtTheOffice

Use case 1, Use case 2



## **A. Appendices**

### **A.1 Appendix 1**

### **A.2 Appendix 2**