Universidad Autónoma de Ciudad Juárez
Métodos formales en especificaciones y diseño en software

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1. Introduction

1.1 Propuse

The objective of this document is to present in a specific way the development of a system that provides an online store and services for employees.
This section shows how the system works in general terms, how the system will react in different situations and how it can be used in different perspectives (user/worker).
The document defines the system requirements in a detailed and specific way by using UML diagrams and entity-relationship diagrams.

1.2 Scope

The web application will display a catalog of products which the user will be able to purchase online using debit/credit cards.
Likewise, the system has a second view, the employee's view. This view will be able to perform more actions than that of an ordinary user. Among these, the user will be able to add products, request a loan from the company and purchase products.
Finally, the system will have a section for the owner(s) where he/she will have the option to approve employee loans.

1.3 Definitions

Term	Definition
E-commerce	Electronic commerce, which refers to the buying and selling of products or services over the Internet.
Cart or Cart icon	Shopping cart, the virtual container where users add products before purchasing.
Actors	The users that interact with a system. An actor can be a person, an organization, or an outside system that interacts with your application or system.
API	API is the acronym for Application

	Programming Interface, which is a software intermediary that allows two applications to talk to each other.
Database	Database is a systematic collection of data. Databases support storage and manipulation of data. Databases make data management easy.
Stakeholder	Any person with an interest in the project
SRS	Software Requirements Specification
Responsive design	It's an approach to web page creation that makes use of flexible layouts, flexible images and cascading style sheet media queries.
Main page	It's the main web page of a website.
Registered user	A user who has an account and has access to make more action in the web application
Login user	Refers to the process where a user provides credentials, such as a username and password, to access a secure area or account on a website.
Logout	The process of ending a user's session, typically initiated by the user clicking a "Logout" button. It enhances security by preventing unauthorized access after the user has finished their session.
User Profile	A collection of personal and account-related information associated with a specific user, often editable by the user after logging in.
Credentials	Information used to verify the identity of a user, often including a username or email address and a password. Some websites may also use additional factors like two-factor authentication.
Authentication	The process of verifying the identity of a user, typically through the use of a username and password combination.
Session	A period of interaction between a user and a website, starting when the user logs in and

	ending when they log out or their session expires due to inactivity.
Payroll	refers to the process by which employers calculate and distribute compensation (wages or salaries) to their employees. It involves various tasks related to financial record-keeping, tax withholding, and compliance with labor laws.

1.4 Overviews

The document is divided into different sections, the following parts will show the system requirements and how they will be developed with the visual aid of UML and entity-relationship diagrams.

2. Overall description

2.1 Producto perspective

The system is a virtual store which will have 3 different views, a view for the common user, employee and owner. Each one depending on the hierarchical level will have more options of use.
The common user would only have the option to buy products using bank cards.
The employee will have the same options of a common user but will also have the ability to add products and borrow money.
Finally there is the owner who will have full access to the system and will also be able to accept loans from employees.

2.2 Products functions

- User register
- User login
- User logout
- Search products
- Shopping cart
- Payroll
- Loans

2.3 User characteristics

Actors	Descriptions
User	Users do not need to have a specific interest, they just need to be able to understand what an online store is, as they must have an account to be able to perform the essential actions for this role.
API	A service agreement between two programs is similar to the application programming interface. Communication as well as requests and responses will be possible through this interface. In this case, we use the PayPal API.
Database	An organized set of data that is stored in a structured manner so that it can be easily managed, accessed and updated. It is designed to enable efficient information retrieval and the handling of large amounts of data in a systematic manner.

2.4 Constraints

- Users can not make payments within the platform.
- The user must have an internet connection to access the platform.
- The user must use a secure password to register, which has uppercase, lowercase and numeric characters.
- The user must enter the password twice to confirm that the correct password has been entered on the first attempt.
- The user must have his account logged in in order to allow the recommender system to make more accurate recommendations based on his knowledge and searches
- The user needs to be logged in to make purchases in the cart icon

2.5 Assumptions and dependencies
It is assumed that users have a mobile device(PC,Tablet,cell phone) with Internet access, so that they can make use of the platform.

It is also assumed that users know how to use these devices and navigate through the internet.

2.6 Apportioning of requirements

The main requirements that are defined and will be available are:
- New users can browse the platform and register.
- Registered users can login and edit the available parameters of their profile.
- Database administrators will be able to create new categories.
- Database administrators will be able to create new tables and they can insert rows into a table, as well as add or remove users.
- The database will store user, category and platform information

The requirements that are delayed and will be implemented for future versions:
- PayPal functionality in payments and transfers

3. Specific requirements

The website consists of 8 main views, which are:
- Main page view
- Register and login view
- Product Details view
- Shopping cart view
- apply for loans and accept loans view
- pay payroll view
- pay with card view
- pay with transfer view
- User Profile view
- Add Product view
- Categories view

In the homepage view, you will find the latest added products at the top, followed by other products below. These will link to the product details view, as well as the register and login views, where users can log in as employees, regular users, or administrators. From there, it connects to the shopping cart view, specifying the items you intended to add. Next, it directs you to the "pay with card" view. If you're an employee, it further connects you to the loan request view. For administrators, two additional views for payroll and loan approval are available, linking to the "pay with transfer" view.

3.1 Testing

It seems like you're describing a rendering host testing scenario where you observed minimal page load times and used 2 MB of the provided free memory when testing with 27 users. If you're looking to improve the performance, consider the following improvements:
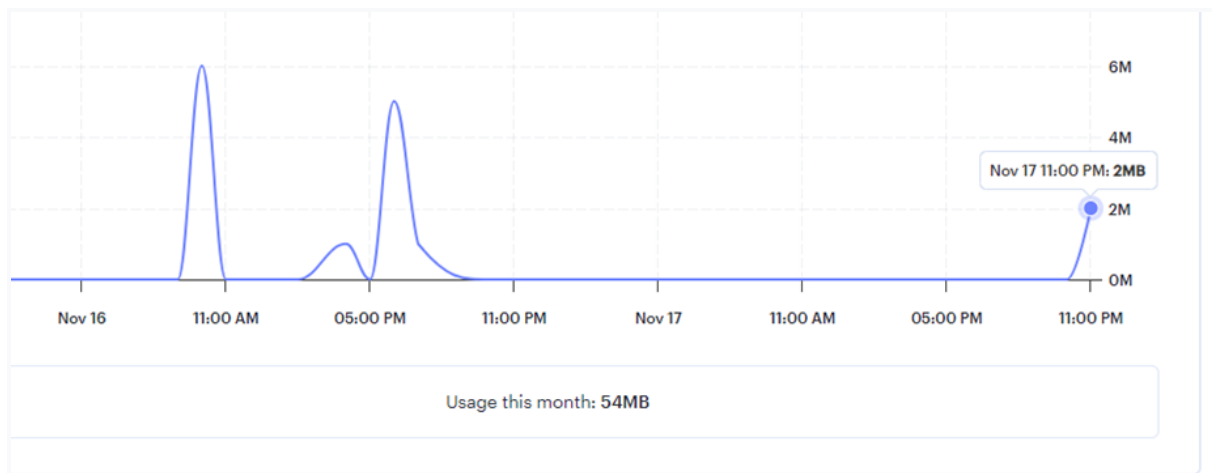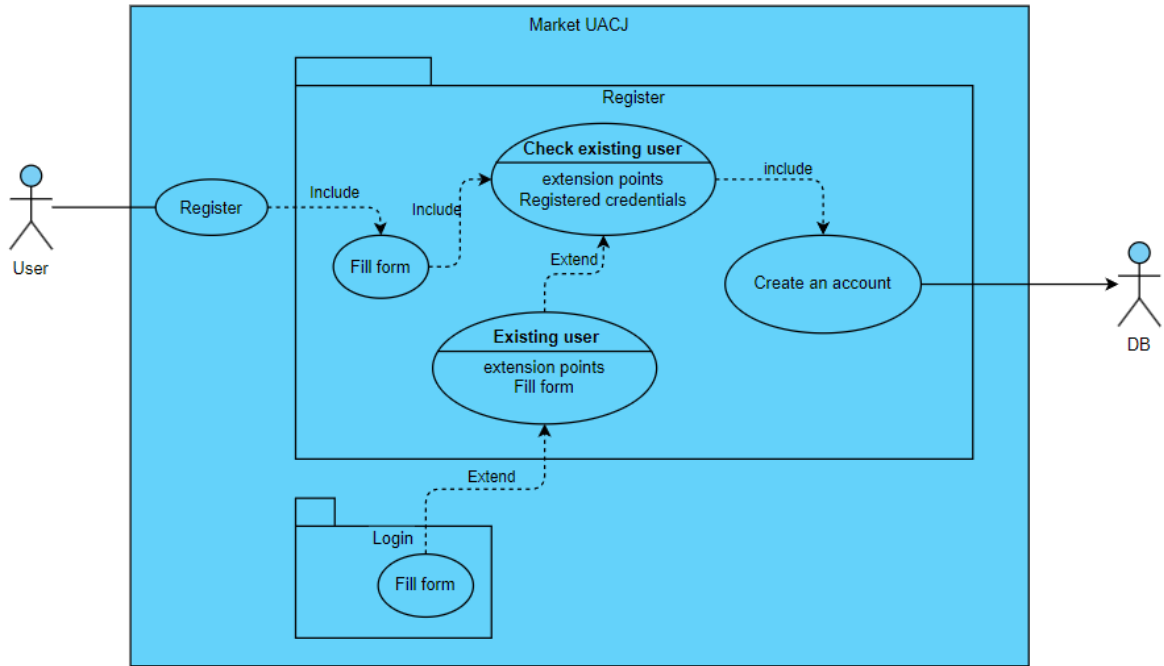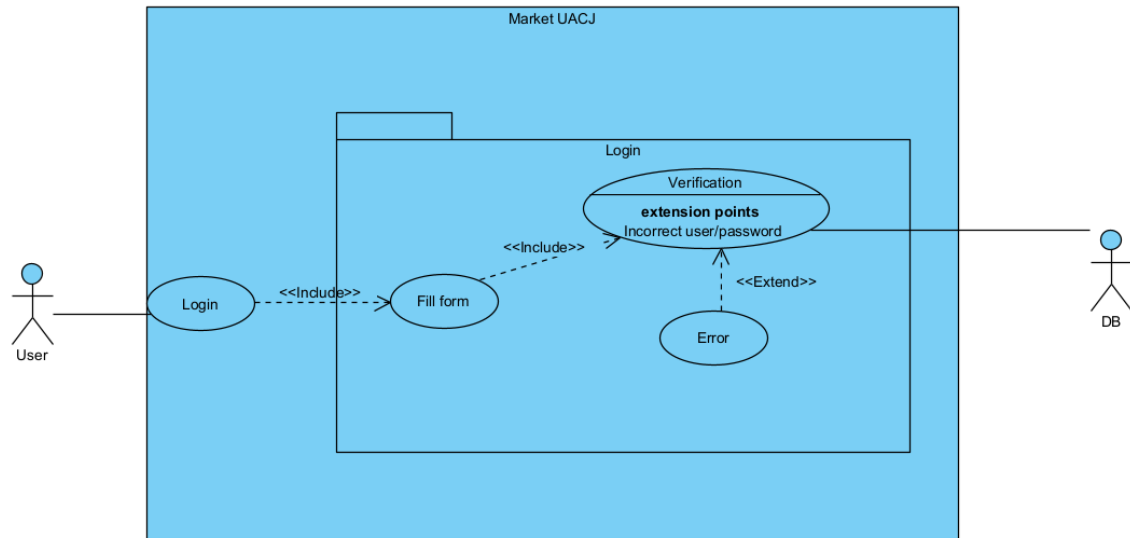

During the rendering host testing, it was observed that there was a noticeable increase in memory usage, specifically a rise of 6 MB, when the user load doubled to 45 users. To enhance performance under such conditions
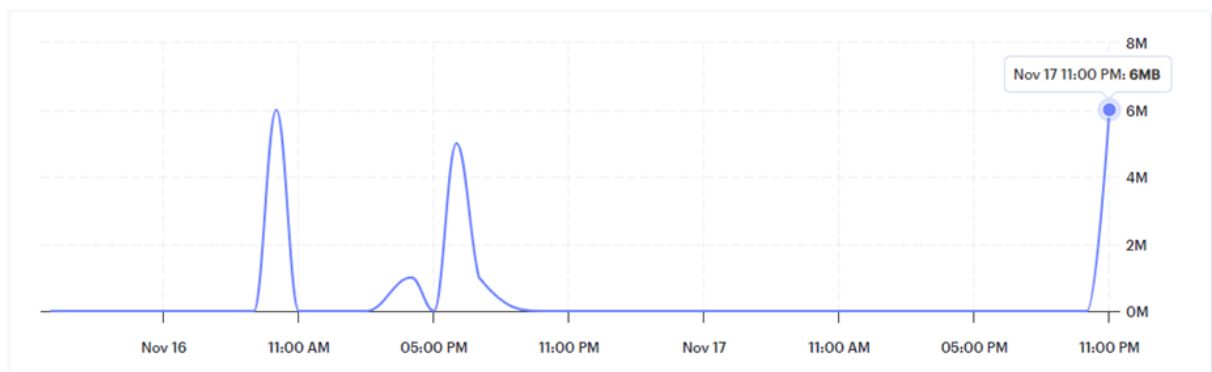

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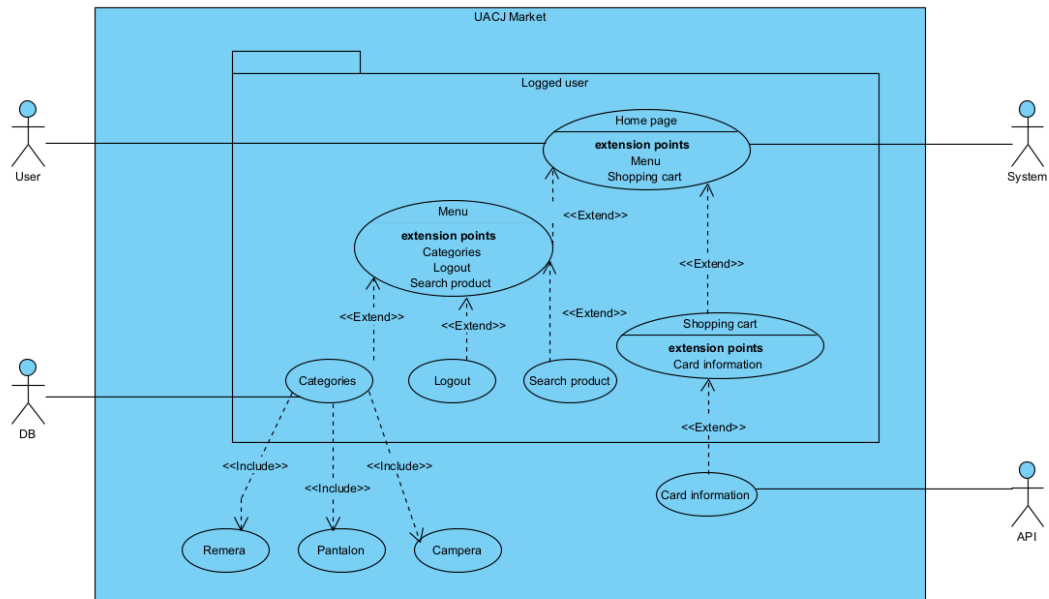
Use case diagrams

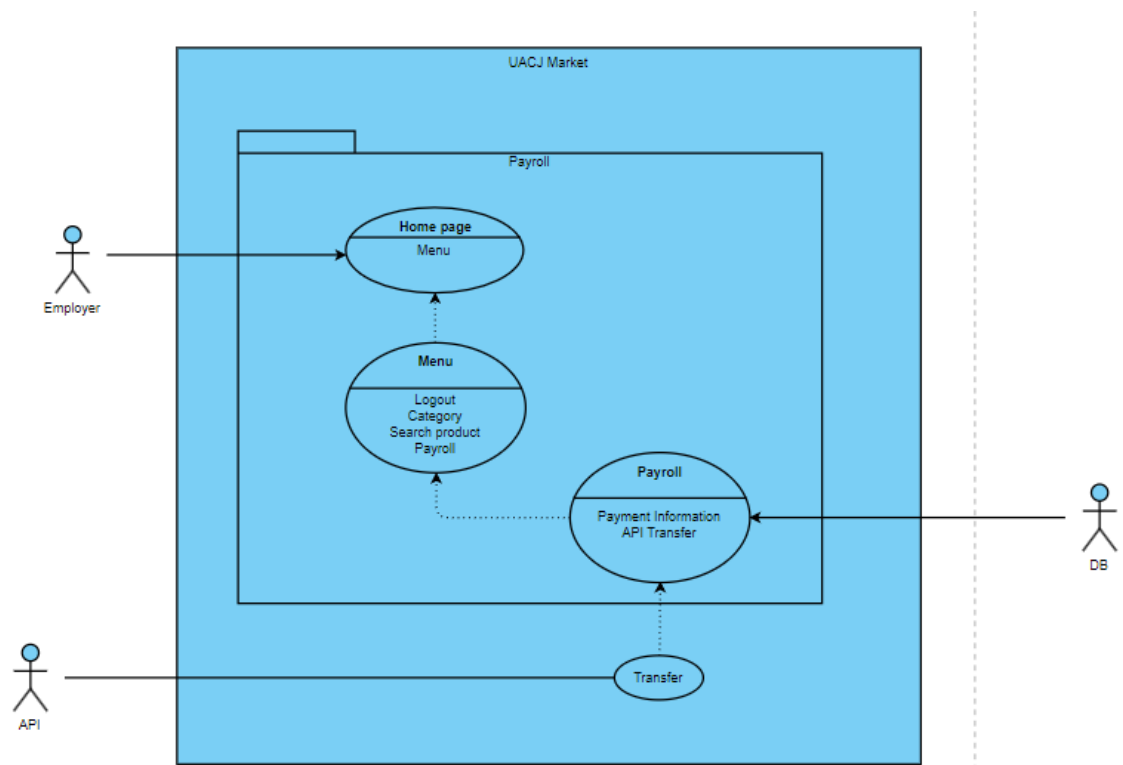| Use Case 1	Register
Author	Ramon Ramos
Date	11/10/2023
Pre-conditions	The user must have an email address The user must not have a previously created account

Main scenario	Click on "register" button
	Fill form:
	    ● Enter email
	    ● Enter user
	    ● Enter password
	    ● Confirm password
	    ● Click on "create account" button

Secondary scenario	User already exist
Actors	User Database
Post-conditions	The user is redirected to the main page, with his account already registered.

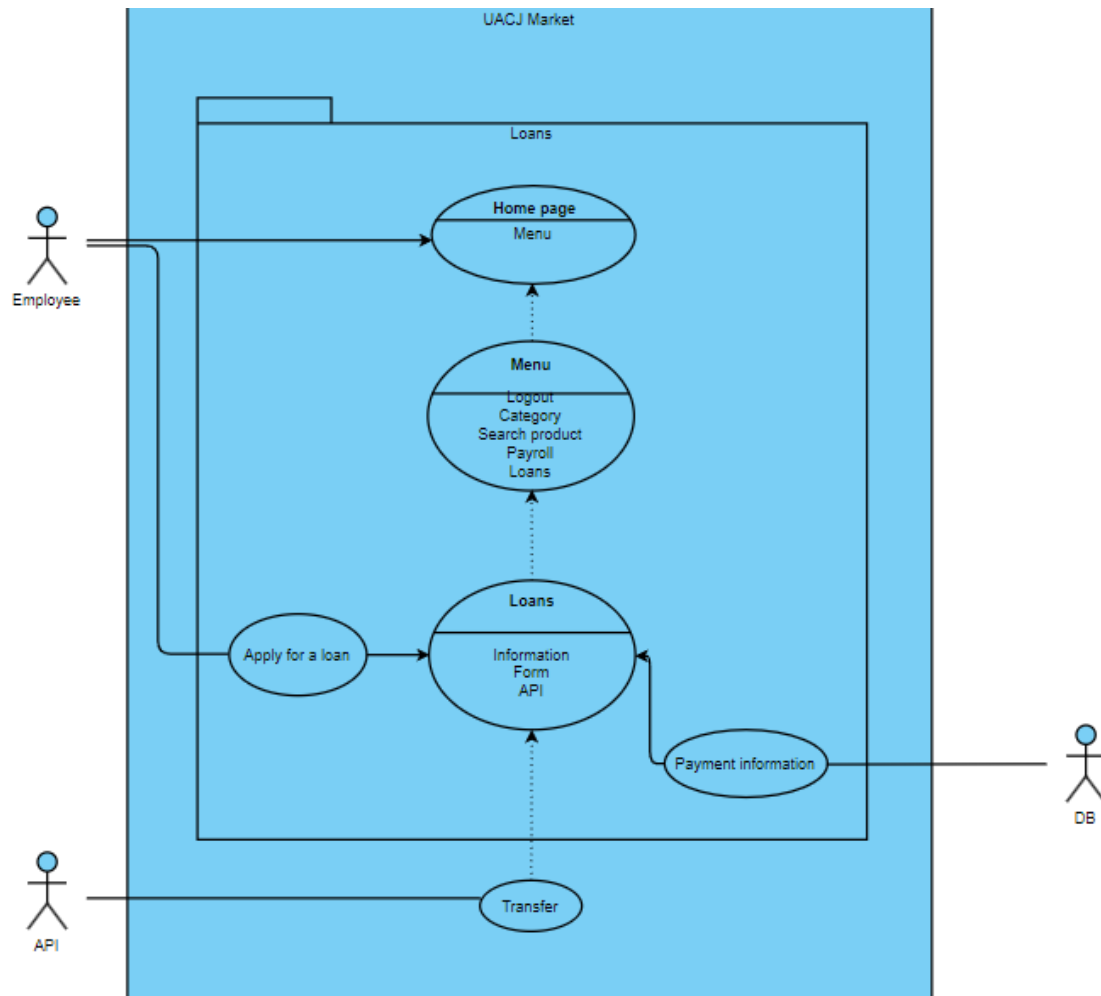| Use Case 2	Login
Author	Alejandro Gasca,Mario Moreno
Date	11/10/2023
Pre-conditions	User must have a registered account
Main scenario	Click on "login" button Fill form: • Input user • Input password • Click on "login"
Secondary scenario	Error message for password or user
Actors	User Database
Post-conditions	The user can select products to buy.
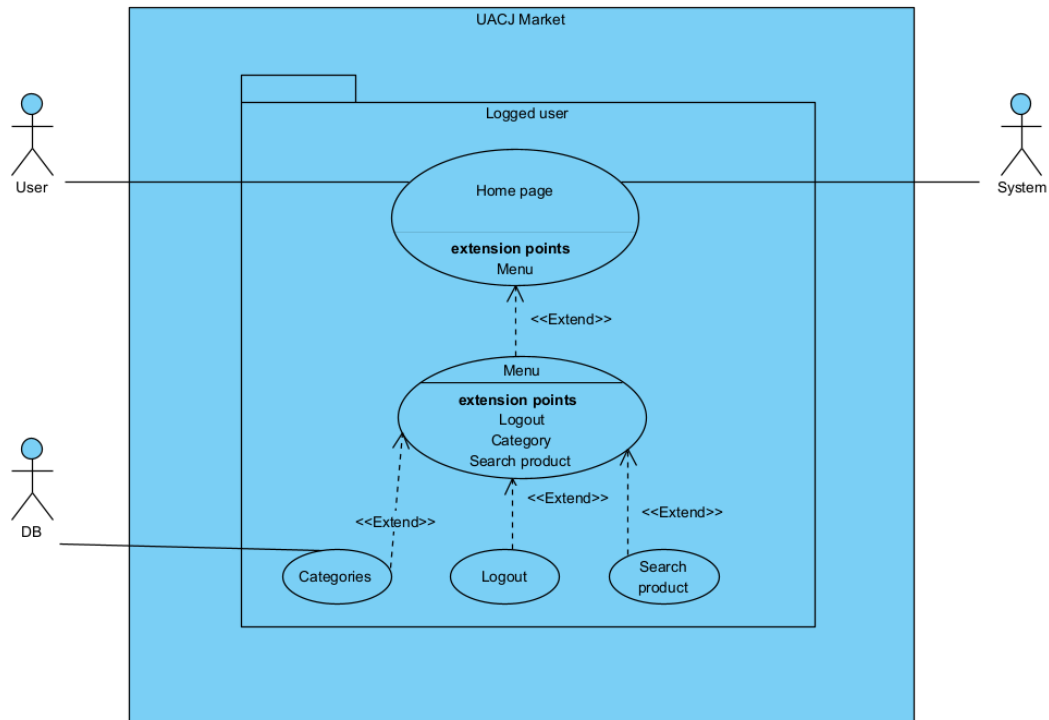
Use Case 3	Logout
Author	Alejandro Gasca
Date	24/10/2023
Pre-conditions	User must have a logged account
Main scenario	Click on "logout" button
Secondary scenario	NA
Actors	User Database System
Post-conditions	User logged out Returned to a home page.

Use Case 4	Shopping cart
Author	Alejandro Gasca
Date	24/10/2023
Pre-conditions	User must have a logged account
Main scenario	- Select a product and click on "ver" button - Click on "agregar al carrito" button - Click on shopping cart button - Click on "vaciar carrito" or "finalizar compra" button - If the user select "finalizar compra" - Add card information - Click on "procesar pago" button - If the user selects "vaciar carrito" - Empty cart
Secondary scenario	The user is not logged The user cannot buy products
Actors	User Database System API
Post-conditions	Returned to a home page.

| Use Case 5	Payroll
Author	Ramon Ramos
Date	25/10/2023
Pre-conditions	The subject must be an employee of the company Has an associated account number
Main scenario	In the main menu Click on "Menu" button Select payroll Click on the button, pay weekly payroll.
Secondary scenario	
Actors	Employer Database API
Post-conditions	The transfer must have been made to all employees

UACJ Market

Loans

Home page
Menu

Employee

Menu
Logout
Category
Search product
Payroll
Loans

Loans
Information
Form
API

Apply for a loan

Payment information

DB

Transfer

API

Use Case 6	Loans
Author	Ramon Ramos,Mario Moreno
Date	26/10/2023
Pre-conditions	The subject must be an employee of the company Has an associated account number
Main scenario	In the main menu Click on "Menu" button Select loans Click on the button, Apply for a loan. Select the amount Verify correct data Click on apply for a loan.
Secondary scenario	Mandatory fields not filled in
Actors	Employee Database API

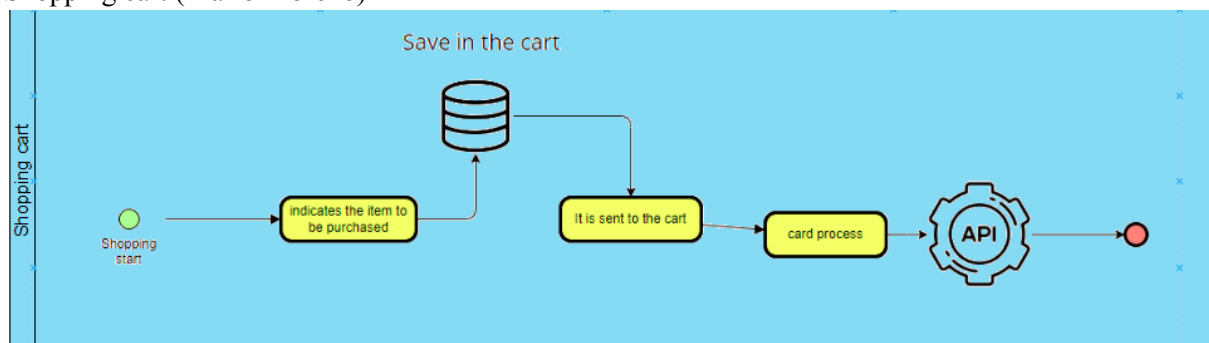| Post-conditions	The employee receives a transfer to his or her associated account number.

Business Process Diagram
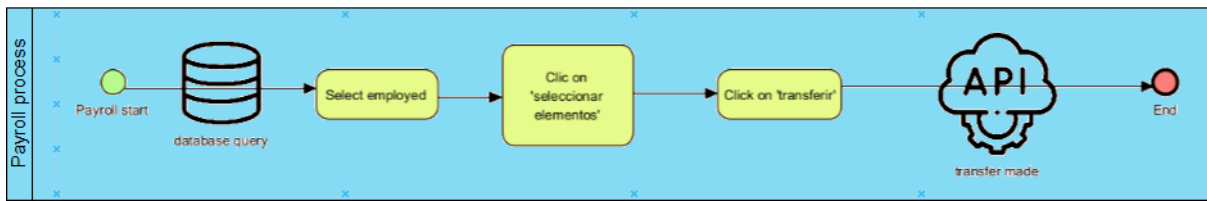
Register process (Alejandro Gasca)
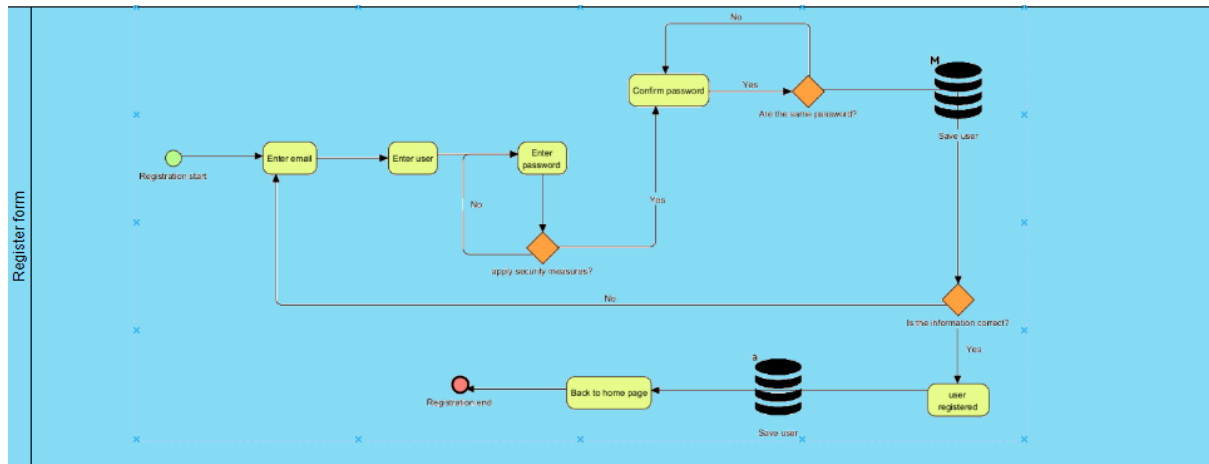
Login process (Mario Moreno)
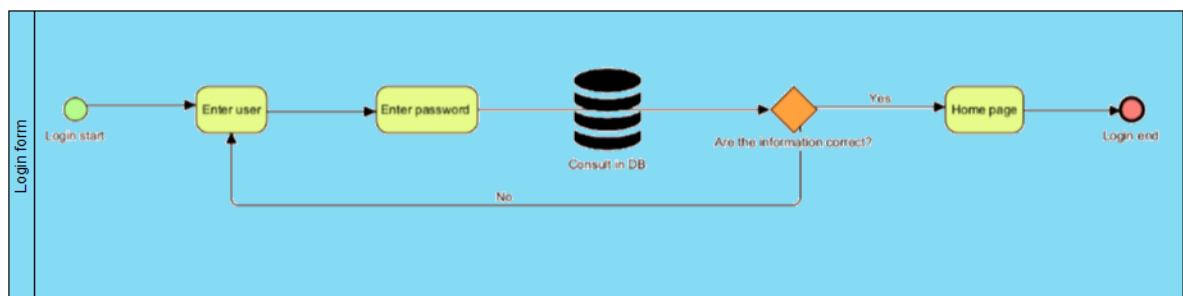
Shopping cart (Mario Moreno)

Payroll process (Alejandro Gasca)
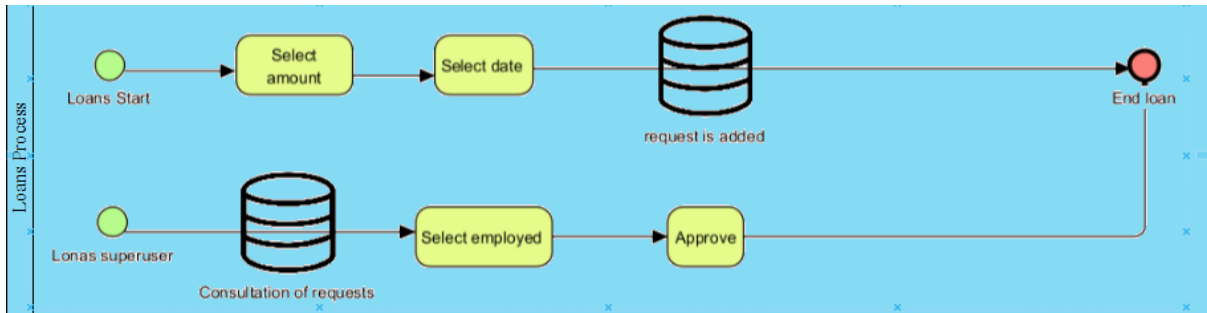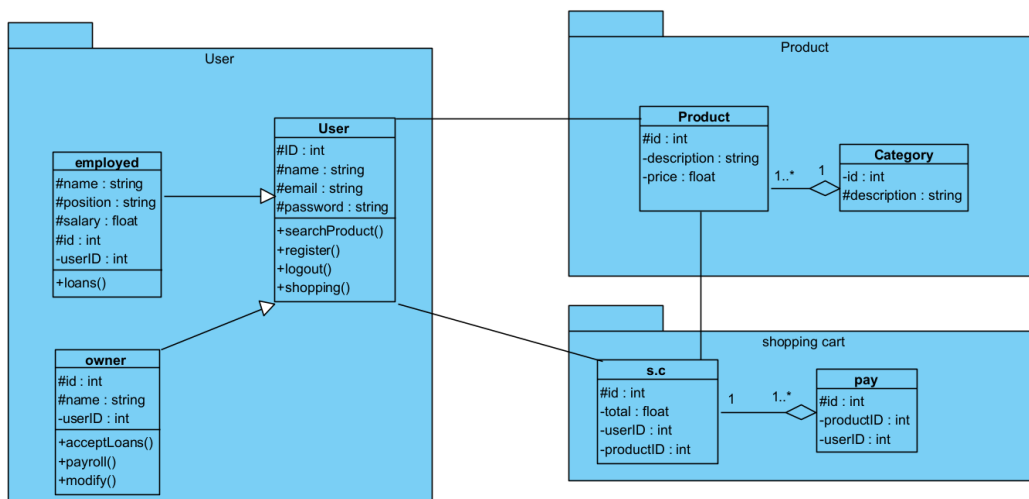
Loans Process (Alejandro Gasca)

Diagram class (Alejandro Gasca)

Entity relationship (Alejandro Gasca)