FINAL EXAM OF OBJECT-ORIENTED ANALYSIS, DESIGN AND IMPLEMENTATION

Desktop application

(BOBO'S SUPERMARKET System)

COORDONATOR :

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GROUP INFORMATION :

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COURSE CODE: SEN3241

Link to GitHub Repository:

TABLE DES MATIERES

I. INTRODUCTION :

1- GENERAL INTRODUCTION

Our project is about the building of a store system management. The store that we chose is the supermarket named BOBO'S SUPERMARKET.

In team of five members, we will build it. But before there are some steps that will be presented in the following lines.

2- AIM AND OBJECTIVES

Bobo supermarket aims to revolutionize the grocery shopping experience by offering a seamless online platform for customers.

The primary goal of Bobo supermarket is to provide customers with a convenient and efficient way to purchase products online. This entails offering a wide range of products, user-friendly interfaces, and reliable delivery services to ensure customer satisfaction.

3- PLOBLEM STATEMENT

Despite the growing demand for online supermarket, there are challenges such as inventory management, delivery logistics, a gain of time when people order online, and ensuring a smooth user experience. Bobo supermarket aims to address these challenges through the adoption of the scrum methodology.

II. LITTERATURE REVIEW:

The project has as plan:

1- SOFTWARE DEVELOPMENT METHODDOLOGIES:
2- COMPARISON BETWEEN DIFFERENT SOFTWARE
3- REASONS FOR CHOOSING THE SCRUM METHODOLOGY
4- GENERAL REVIEW OF RELATED CONCEPTS
5- REVIEW OF RELATED CONCEPTS WITH RESPECT OF OUR CHOSEN PROJECT

1- SOFTWARE DEVELOPMENT METHODOLOGIES

We have many methodologies. An in-depth analysis of various software development methodologies, including Waterfall, iterative model, V-shape model, big-bang model, Agile, and Scrum…etc, will be conducted to determine their suitability for the development of Bobo supermarket.

The planning and analysis of the project:

The Feasibility of the project:

The feasibility study is focused towards the goal of the organization. It creates the reason for developing the system. It explores the TELOS (Technical, Economic, Legal, Operation, Scheduling) feasibility aspects of the project.

- Technical feasibility:

About the technical resources, we need:

An application when we will develop the system and we can have it freely and easily. It's VBA (Visual Basic of Application) in Microsoft Excel

An application to draw all the diagrams that we need: 5 sequence diagrams, class diagram, object diagram and the user case requirement. We will need UML STAR and we can have it easily and freely

Different computers with a great respond time and throughout. So, computers with around i-5 core of the processors. We can have it also easily and freely

Conclusion: concerning the technical feasibility we can valid the project.

- Financial feasibility:

About the financial feasibility, we will compare the cost that the project will be to the advantages of the project.

About the cost of the project:

The work will be done by all the team and during four weeks.

The team of requirement will have two members and will work during 6 days with 8 hours per days and on Sunday during 4 hours. They will be paid 4500 FCFA per day. And in all they will work during two weeks so 104 hours. That does as total 468 000 FCFA for the team

The team of implementation will have two members and will work also during 6 days for 8hours and on Sunday also during 4 hours. They will be paid 5000 FCFA per day. And in all they will work during one week so 52 hours. That does as total 260 000FCFA

The project leader will belong to one of the two teams and will have the same cost of that team but plus 2000 FCFA. So, he will have about 676 000FCFA from the requirement team and 364 000FCFA from the implementation team.

About the financial advantages of the project:

The system will reduce the expenses about the register of transactions in the supermarket. Before they could use five register per months which cost about 5 000FCFA and on total 25 000FCFA per months and 300 000 per year

The system also reduces the expenses about the biller reader. The store could use 5 billers at least per month. If each other cost 7 000fcfa we will have 35 000fcfa at least per month and 420 000FCFA per year.

The system will reduce the expenses about the pens. Considering they use three kinds of pen (red, blue and black). And per month they need three boxes of each colour. If they cost 7000fcfa each other we will have per month 63 000FCFA as expenses and 756 000FCFA per year

It also reduces the waste of money by the supermarket because of mistakes when we did count of transactions in the store. Because the mathematics linear written in the system will never give false answers thus never deceive the financial management of the supermarket.

Conclusion: when we compare the cost of the project and the financial advantages that the project gives, we can conclude concerning the financial feasibility that we can valid the project

- Legal feasibility:

It includes market and competition breakdown analysis as well as sales forecasts.

And our system will perform the sales and profits of the supermarket making it quite competitive and allowing it to manage its stock well to avoid any major losses due to management.

Conclusion: so, we can valid this project on this aspect

- Operation and scheduling feasibility:

Here we will evaluate if our team members will able to finish at time the building of the project.

Our teams are formed of three members who do different tasks in the plan project. They have each other a deadline for doing their work.

We have three weeks to work on it. We scheduled the work like:

Every day during 8 hours without break

Every Sunday during 4hours without break

Online working and onsite working in other we can match our work and check his development

We have competent members and they are very professional, and love only the good work. So, the project will be ready at time and operational.

2- COMPARISON BETWEEN DIFFERENT SOFTWARES

A comparative study will be conducted to evaluate the strengths and weaknesses of different methodologies, With a focus on Agile methodologies, like Scrum.

3- REASONS FOR CHOOSING THE SCRUM METHODOLOGY

The reason behind selecting Scrum as the preferred methodology for Bobo Store's development will be discussed, highlighting its iterative and incremental approach, which aligns with the dynamic nature of the project.

4- GENERAL REVIEW OF RELATED CONCEPTS:

5- REVIEW OF RELATED LITERATURE:

A review of existing literature related to online supermarket development and Agile methodologies will be conducted to gather insights and best practices for Bobo Store's implementation.

III. METHODOLOGY AND MATERIALS:

1- PROJECT METHODOLOGY:

Detailed guidance on implementing the Scrum framework, including roles, events, and artifacts, we have different actors and actions:

- A store man or admin: their roles are to check the stock, register employee, buy articles, receive bill command, sell articles;
- A supplier: provides articles;
- Employees: are capable to login in a system and produce a bill;
- Customer: purchase articles;
- System: which contains all configurations.

Then, we have two (02) types of relations in that diagram:

- “Generate a bill” includes “produce a bill”; “Generate a bill” can’t exist without “produce a bill”.
- “Generate a bill” includes also “purchase articles”; one does not exist without the other.
- “Keep transactions” is a sub-case of “check the stock”; the first generalizes the other.

2- SYSTEM REQUIREMENTS

Identification of functional and non-functional requirements, along with the system architecture (High-Level Design) and Unified Modeling Language (UML) diagrams, will be outlined. The requirements of the client are divided in different types:

- The functional requirement: The client wants that the system

manages the stock of his store;

allows him to insert and remove the products from the stock of his store through his order;

should able to keep the records of the different users among: (the storeman, the clients, the employees, the supplier of products) and their actions in the system;

should contain an excel database among the various sheets of the application to serve as the database of the application;

should be able to print an order for stock and receipt after delivery;

should able to print reports on transaction within a particular period;

- the unfunctional requirement: the management system of the store will respect:

reliability: the system will be made with many securities through the password to some slide which will reduce the access to the system and secures the data of the system and allow the good management of the store;

Efficiency: the system will be clearly defined in order any functional requirements will be respected and it will do quickly, and specifically the task ordered;

usability: any person with the permission of the storeman can use easily the system because the interface will be very understandable;

Maintainability: the system will be able to update dysfunctionality encounter;

Portability: the development of the system will allow him to be used in any system without bugs of issues;

- The usability requirement: the system will able to respond of these questions:

  Who: the system will be mainly used by the PDG after by his employees. And it will contain also the different clients of the store and the providers.

  What: the system will allow the store man or admin to control the stock of his store, to do bill for any articles bought, to report all the clients and their actions in the store, to add or remove articles. About its employees, it will allow them to sell clearly the products of the store and print the bill of any products.

  When: the system will be used as soon as the application will already operational. It will not wait to the complete development to be used. And it will be used at any time.

  Where: the system will be used in the store of the client and also in his different electronics devices in which he could want to check the functionality of his store

  Why: the system is used in order to manage all the store of the client and ensure a good business to the store man

- Performance requirements:

  Speed;
  accuracy;

Availability;

Throughput;

Capacity;

error rate;

customer experience;

- Security requirements:

  User authentication: it will check and allow the different parts of the system to a specific user. By the password answered to load the system it will reduce the access of the system and its security

  The system will ask a password and username which are private of the user before enter into the system.

  To allow of some pages, like the stock, the sales and purchases history the system will request an identification of the user.

3- SYSTEM DESIGN

Architecture of our system (High Level Design)

here it's how our system will works.

- To build our system, we will use the Visual Basic language to develop the application.

- We will also build a requirement diagram of the user case which will allow to see well all the actions and transactions of the users in the system and the relationship between us. Also, the sequences diagram, class diagram of the user case which represent graphically how transactions will be done in the system.

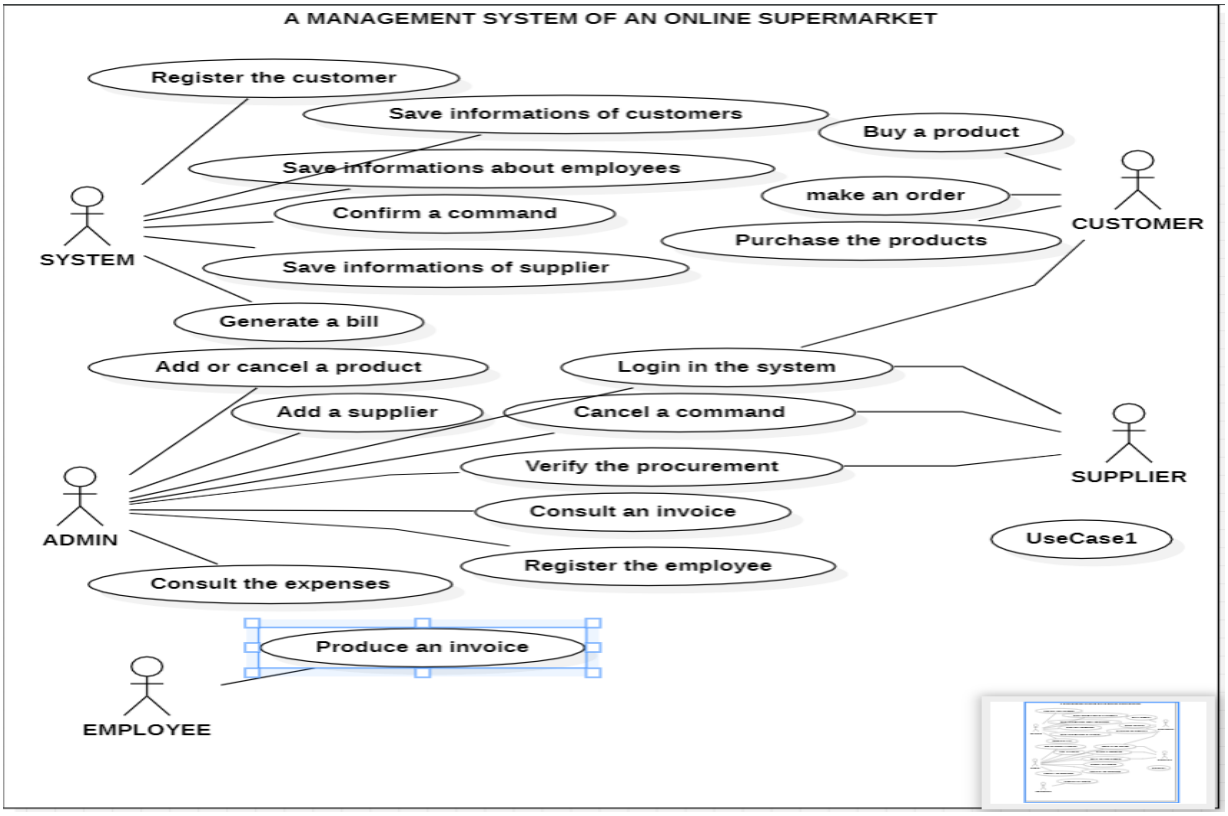
- We will also draw the object diagram which will allow to visualize the functionment of the set of the system

- We will form team of requirement which contain two members, team of implementation which contains three members: one for the graphical

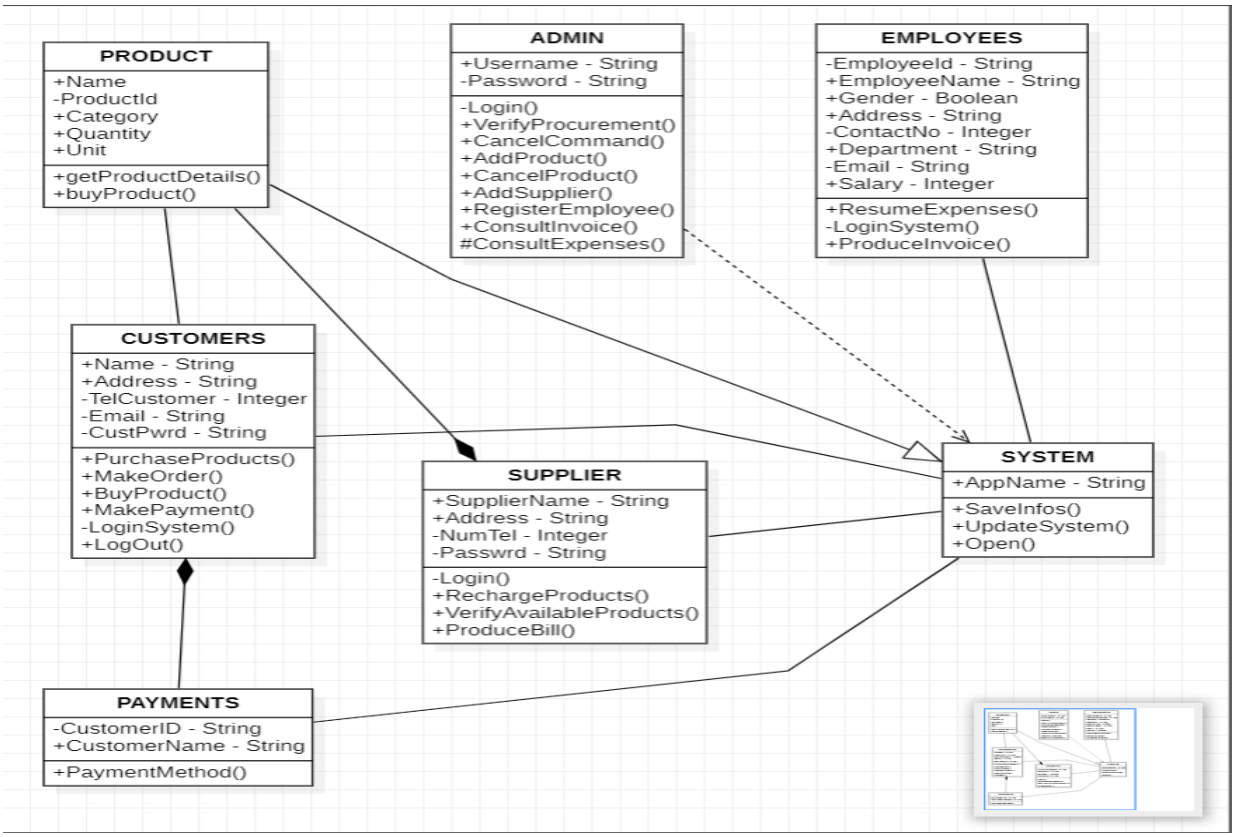
user interface development and the three members for the back end of the application.

UML diagrams

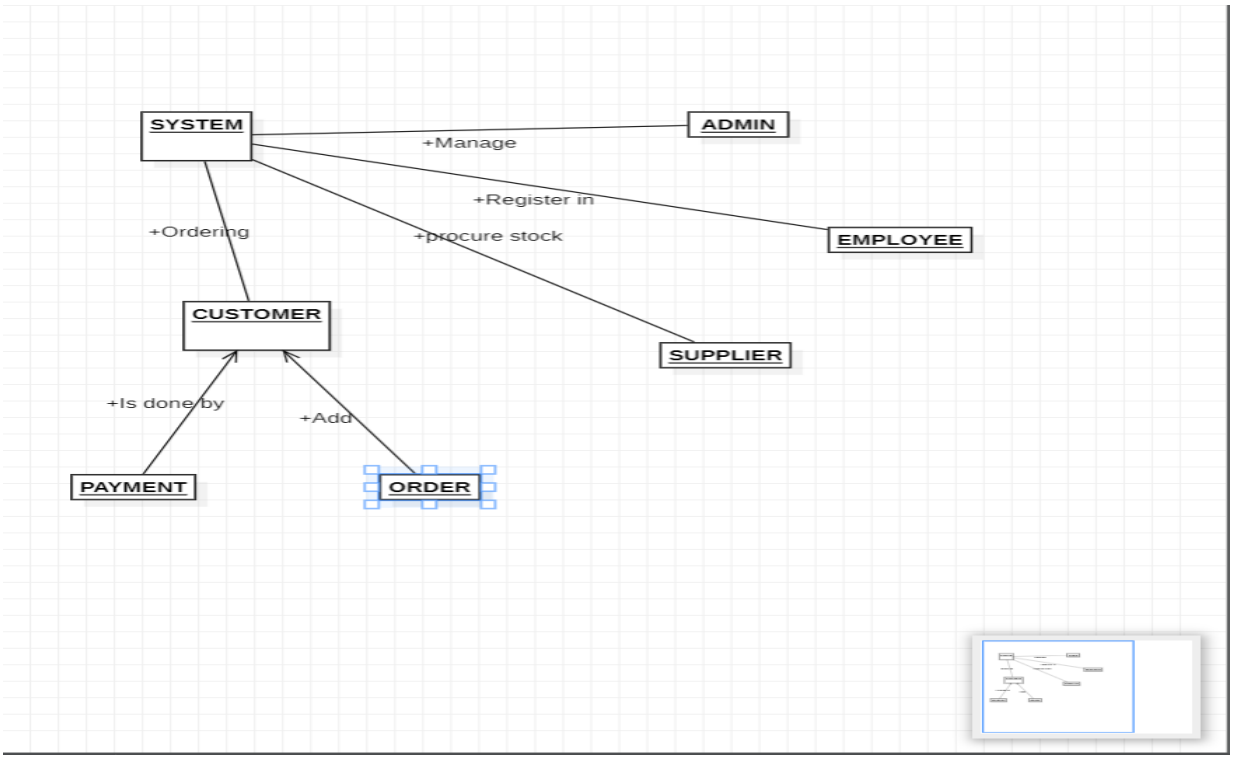
- A use case diagram



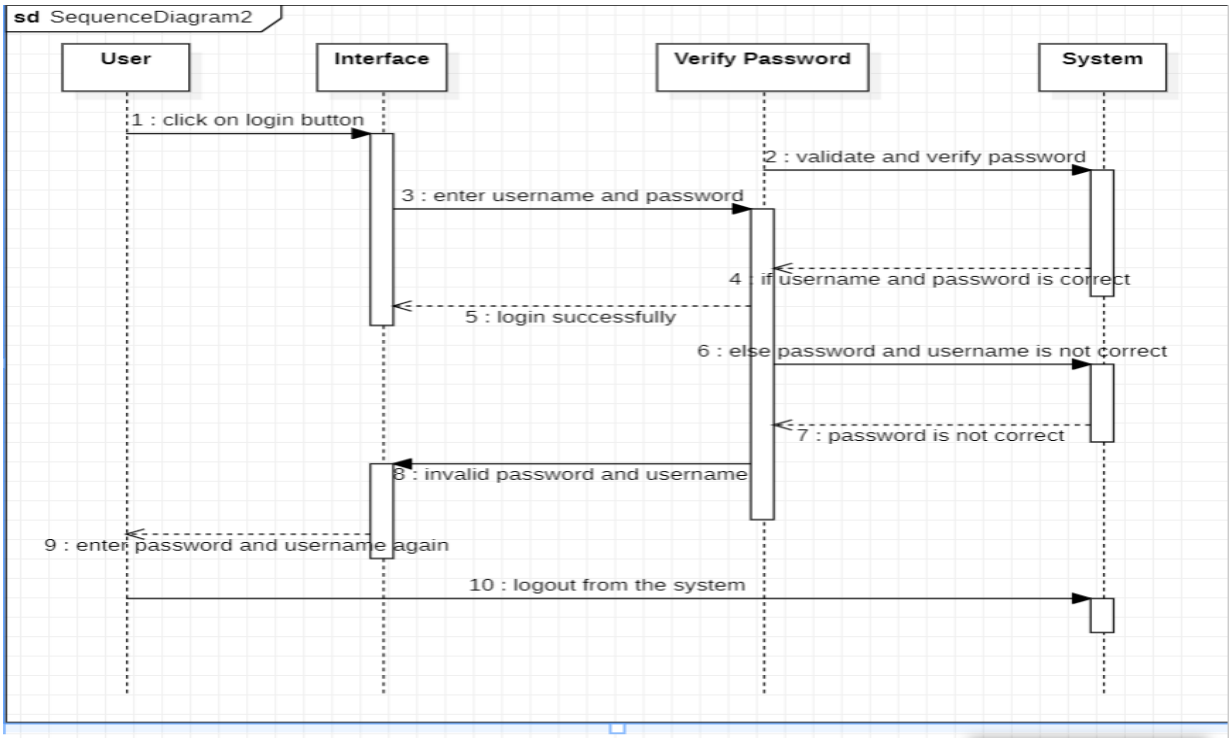
- A class diagram

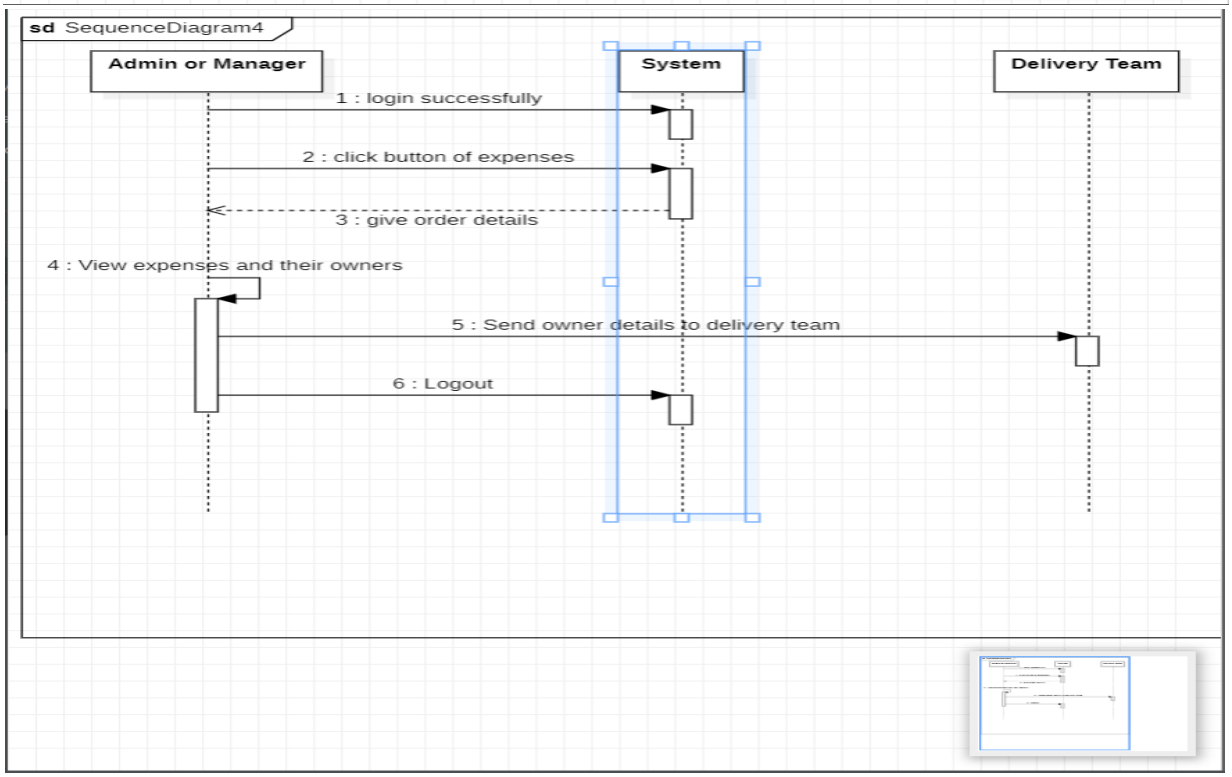


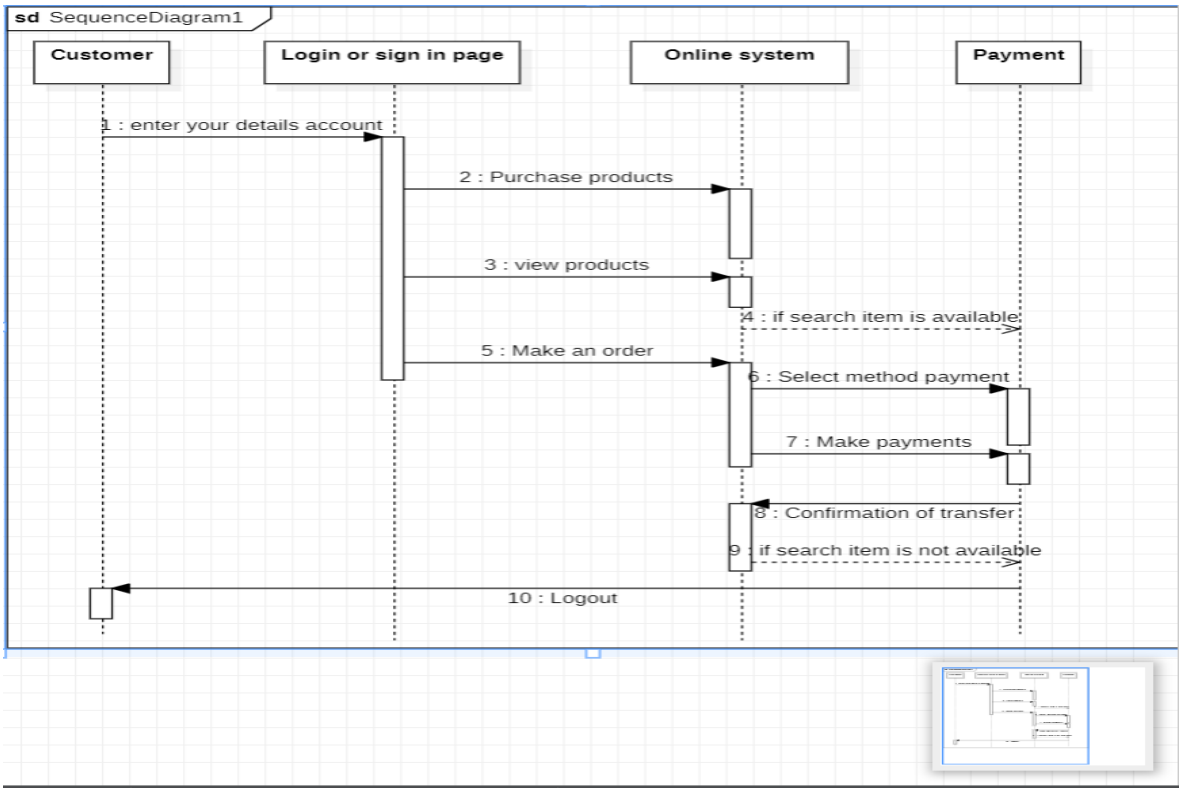
- An object diagram

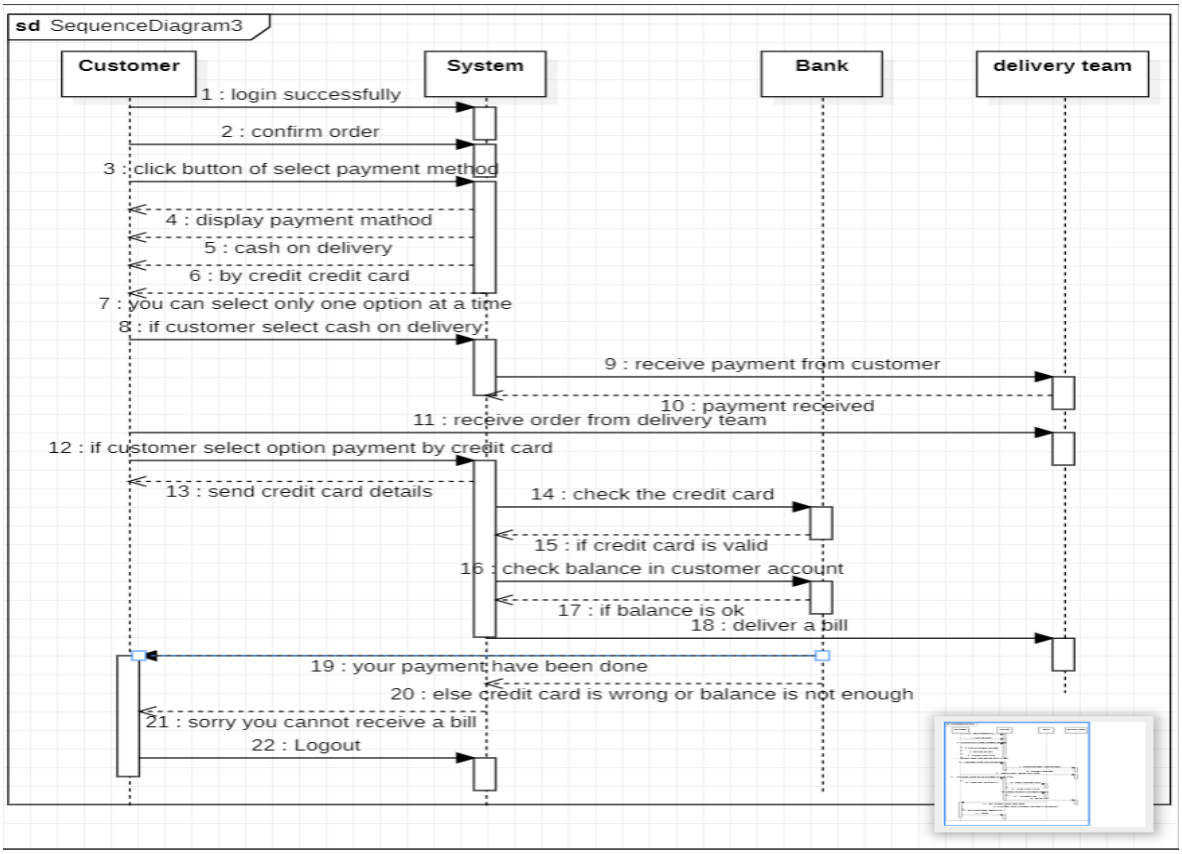


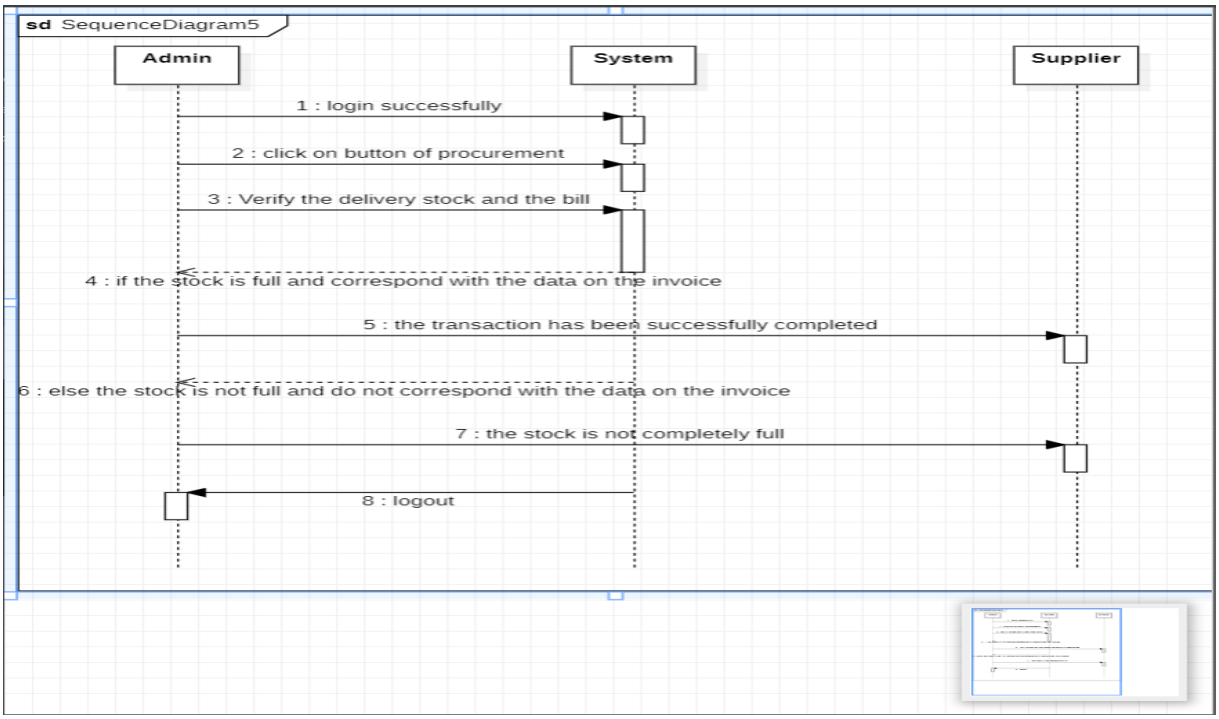
- The sequence diagrams:


sd SequenceDiagram2
User
Interface
Verify Password
System
1 : click on login button
2 : validate and verify password
3 : enter username and password
4 : if username and password is correct
5 : login successfully
6 : else password and username is not correct
7 : password is not correct
8 : invalid password and username
9 : enter password and username again
10 : logout from the system


sd SequenceDiagram4
Admin or Manager
System
Delivery Team
1 : login successfully
2 : click button of expenses
3 : give order details
4 : View expenses and their owners
5 : Send owner details to delivery team
6 : Logout


sd SequenceDiagram1
Customer
Login or sign in page
Online system
Payment
1 : enter your details account
2 : Purchase products
3 : view products
4 : if search item is available
5 : Make an order
6 : Select method payment
7 : Make payments
8 : Confirmation of transfer
9 : if search item is not available
10 : Logout


sd SequenceDiagram3
Customer
System
Bank
delivery team
1 : login successfully
2 : confirm order
3 : click button of select payment method
4 : display payment mathod
5 : cash on delivery
6 : by credit credit card
7 : you can select only one option at a time
8 : if customer select cash on delivery
9 : receive payment from customer
10 : payment received
11 : receive order from delivery team
12 : if customer select option payment by credit card
13 : send credit card details
14 : check the credit card
15 : if credit card is valid
16 : check balance in customer account
17 : if balance is ok
18 : deliver a bill
19 : your payment have been done
20 : else credit card is wrong or balance is not enough
21 : sorry you cannot receive a bill
22 : Logout



4- **Application of Scrum**:

Practical applications of Scrum in team organization, workflow management, conflict

Team organisation:

- Project team:

  System analysis team: is responsible to determining if the project is feasible

  Planning team: is responsible for developing the overall management plan for the project and making sure that the project is proceeding within the expected time frame of various activities

  Requirement team: meet the customer and determine a complete, precise set of requirements for the project

System design team: produce a detail design interact with the implementation team that receive the designs for implementation

Implementation team: implement the project designed by the design team

Testing and integration team: formulate test cases for the modules and systems that are created by the implementation team

Deployment team: to get access the users to our software.

Maintenance team: maintain the software developed after it is delivered and installed.

- Scrum Master: plan and develop the project idea. Create and manage the project teams and their works in order the software is done at time

- Product owner: is responsible of the overall success of the project. Including appointing the project manager and team, defining success criteria and ensuring the successful delivery of the project; define the requirements of the project

- End Users they use finally the software to do their task

Workflow management:

For our work we will use the incremental model. Because:

it generates working software quickly and early

It is more flexible less costly to change scope and requirements

It is easy to test and debug during a smaller iteration

In this model customer can respond to each built.

Sprint Artifacts:

Creation and management of Sprint Backlogs and Product Backlogs, along with the Test-Driven Development (TDD) approach, will be discussed.

Materials and Technologies Used:

An overview of the technologies and materials utilized in developing Bobo SUPERMARKET, along with their respective roles, will be provided. We used user's observation and document analysis and brainstorming because it allows us to gather as many ideas as possible from as many people as possible to identify categorize and assign tasks opportunities and solutions quickly.

A test case document:

Here, we will ensure that the requirements of the stakeholders are corresponding with the functionement of the system.

Here, we will give access to our application. so, either by a key USB or by the code of the application, will be accessible.

Challenges encounter and how you overcame them

Here, we have two kinds of maintenance: preventive and curative

- The preventive maintenance that we will do it's to secure the data of the system by confidentiality and secured accessibility.
- About the curative maintenance we will regularly check the system in order to ensure if it always runs well and resolve the issues encountered. Also see if we should develop others concepts to perform the system.

Possible Problems Faced and Solutions:

Anticipated challenges such as scalability issues, technical glitches, and customer support issues will be identified, along with proposed solutions to mitigate these challenges.

III. RESULTS AND DISCUSSIONS:

The implementation of our system will consist of building first the front end of the application with Visual Basic for Applications (VBA) found in Microsoft Excel. And the second step of development will be the coding of the back end. Also using VBA found in Microsoft Excel.

IV. RECOMMANDATIONS AND CONCLUSION

In conclusion, our analysis shows how as software engineering, we can build a store system management and all steps we should do in other to develop a good, feasibility and efficace system. Anticipated challenges such as scalability issues, technical glitches, and customer support issues will be identified, along with proposed solutions to mitigate these challenges.

In summary, Bobo Store has successfully developed a robust online supermarket platform, overcoming challenges such as inventory management and delivery logistics. The implementation of the Scrum methodology facilitated efficient project management and collaboration among team members.

Moving forward, it is recommended us Bobo Store continues to prioritize customer feedback and innovation to stay competitive in the online supermarket industry. Additionally, ongoing refinement of the platform based on user insights and market trends will be essential for sustained success.