



**THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE**

Speciality: Computer Science and Entrepreneurship

**TOPIC: development of an e-commerce platform for the sale of farm products in
Burkina Faso**

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DEDICATIONS

For my parents

At this moment of celebration and achievement, I want to dedicate my successes and the completion of this academic cycle to you. Your unconditional love, constant encouragement, and unwavering support have been the pillars that have carried me to this day.

Every step of this journey has been shaped by your values, teachings, and example. Your dedication and sacrifice have illuminated my path and have been a source of inspiration. Your belief in me has given me the strength to persevere through challenges and reach new heights.

Through these accomplishments, I want to show you just how influential you have been. My achievements are a reflection of your tireless efforts to guide me toward success and fulfillment. It is thanks to your love and guidance that I have come this far, and I am deeply grateful for everything you've done for me.

As I cross this important milestone in my life, I do so with the awareness that your values are deeply embedded within me. Your love has given me wings to chase my dreams, and I am honored to carry your legacy with me as I continue to move forward in my life and career.

This success is as much yours as it is mine. I dedicate these achievements to you with all my love and gratitude.

With profound affection,

Nebie Ebou

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Once again, I deeply appreciate your invaluable support throughout this journey.

PREFACE

The Burkina Institute of Technology (BIT) is a private institution located in Koudougou. It opened its doors in October 2018 with the primary mission of "educating a new generation of leaders," leaders who will propose innovative solutions to address societal problems. At its opening, the university had only one department of sciences and a major, specifically in Computer Programming. From this sector, web developers, mobile app developers, and desktop application developers emerge, equipped with additional skills in computer maintenance, data science, and machine learning.

In 2019, one year after its establishment, an engineering department was created, offering the first major in Electrical Engineering and Renewable Energies to train future electricians. Students in this sector also acquire knowledge in programming and, especially, electronics.

Three years later, in the academic year 2021-2022, a new curriculum was launched in the engineering department. This new major is Mechanical Engineering, which is admitting its first class this year.

Education at BIT consists of a theoretical phase that includes the delivery of theoretical courses, and a practical phase involving experiments, lab work, and the completion of an internship in a compatible company at the end of the year. These internships aim to enable students to apply the skills acquired during the academic year and gain exposure to practical work in a corporate environment.

Despite being educated in sciences and engineering, all BIT students possess skills in entrepreneurship, leadership, and management. The bachelor's degree program is designed for candidates with a BAC+3 level, which is applicable to both the science and engineering departments.

Thanks to the quality of its education, the achievements of its students, and its impressive infrastructure and architectural aesthetics, BIT has quickly risen to the top and earned the title of the best private higher education institution. This recognition came just three years after its establishment, with a commendable score of 18.10 according to the monitoring and evaluation report for private higher education institutions

ABSTRACT

The agricultural sector holds a significant place in Burkina Faso's economy. It is practiced in all localities of the country and contributes greatly to improving the living conditions of the local population, primarily addressing the issue of food security. In response to these challenges, several actions have been undertaken by the Ministry of Agriculture, Hydro-Agricultural Development, and Mechanization (MAAHM), but these actions have not been able to reach all producers. Despite the richness of its agricultural resources, the country faces difficulties such as limited market access, expensive intermediaries, and logistical challenges that do not meet the growing market needs. However, computer technology nowadays is an effective means of problem-solving in various sectors, and it is in this context that this present study has focused on the agricultural sector in Burkina Faso. This study proposes a computer-based solution to overcome the difficulties encountered in the field of agricultural product sales. It involves an e-commerce platform that will better facilitate the buying and selling of agricultural products in Burkina Faso. As a country heavily dependent on agriculture, it is essential to establish an online solution to connect farmers and consumers efficiently, promote local agriculture, offer quality products to consumers, and stimulate the economic development of the agricultural sector. Farmers can create profiles to showcase their products on this platform

Keywords:

E-commerce platform

Producer

Products

Sales

Clients

RESUME

Le secteur de l'agriculture occupe une place de choix dans l'économie du Burkina Faso. Il est pratiqué dans toutes les localités du pays et contribue énormément à l'amélioration des conditions de vie de la population locale en répondant surtout à la question de la sécurité alimentaire. Face à ces problèmes, plusieurs actions ont été entreprises par le Ministère de l'agriculture, des aménagements hydro-agricoles et de la mécanisation (MAAHM) mais ces actions ne parviennent pas à toucher tous les producteurs. En effet, malgré la richesse de ses ressources agricoles, le pays fait face à des difficultés tels que l'accès limité aux marchés, les intermédiaires coûteux et les difficultés logistiques, qui ne répondent pas aux besoins croissants du marché. Cependant, l'outil informatique est de nos jours un moyen efficace dans la résolution de problèmes dans plusieurs secteurs d'activités et c'est dans ce sens que cette présente étude s'est penchée sur le secteur de l'agriculture au Burkina Faso. Cette étude propose une solution informatique pour venir à bout des difficultés rencontrées dans le domaine des ventes des produits agricoles. Il s'agit d'une plateforme de e-commerce qui va mieux faciliter la vente et l'achat de produits agricoles au Burkina Faso. En tant que pays à forte dépendance agricole, il est essentiel de mettre en place une solution en ligne pour connecter les agriculteurs et les consommateurs de manière efficace et à promouvoir l'agriculture locale, à offrir des produits de qualité aux consommateurs et à stimuler le développement économique du secteur agricole. Les agriculteurs peuvent créer des profils pour présenter leurs produits,

Mot-clé

Plateforme e-commerce

Producteurs

Produits

Vente

Client

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LIST OF ACRONYMS

BIT: Burkina Institute of Technology

MAHADM: Ministry of Agriculture, Hydro-Agricultural Development, and Mechanization

BF: Burkina Faso

GDP: Gross Domestic Product

NRSP II: second National Rural Sector Program

NPESD: National Plan for Economic and Social Development

DGPRES: Directorate General for the Promotion of Rural Economy

SMEs: Small and Medium Business

NPESD: National Plan for Economic and Social Development

SPVCSP: Agro –sylvo -pastoral Value Chains Support Program

NISD: National Institute of Statistics and Demography

GDP: Gross Domestic Product

MVP: Minimum Viable Product

IS: Information System

UP: Unified Process

2TUP: Two Tracks Unified Process

UML: Unified Modeling Language

IDEF: Integrated DEFinition

PYPL: PopularitY of Programming Language

NASA: National Aeronautics and Space Administration

MVT: Model-View-Template

MVC: Model-View-Controller

DB: database

SQL: Structured Query Language

ORM: Object-Relational Mapping

PC: Personal Computer.

Development of an e-commerce platform

RAM: Random Access Memory

RDBMS: Relational Database Management System

HMI: human-machine interfaces

URL: Uniform Resource Locator

HTTP: HyperText Transfer Protocol

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INTRODUCTION

INTRODUCTION

In Burkina Faso, agriculture holds a significant place in the economy, employing around 86% of the active population, and its contribution to the Gross Domestic Product (GDP) was estimated at approximately 30% in 2009. This sector constitutes the primary source of income for the majority of the population. It provides about 45% of the income for agricultural households, with 24.3% from crop production and 20.4% from livestock. Additionally, there are revenues derived from fishing/aquaculture, small-scale agro-food product processing, and the exploitation of forestry and wildlife sectors.

The second National Rural Sector Program (NRSP II), based on the National Plan for Economic and Social Development (NPESD), aims at the structural transformation of the economy and the agricultural sector in particular. The Directorate General for the Promotion of Rural Economy (DGPRE) was established in 2008 by the Ministry of Agriculture, Hydro-Agricultural Development, and Mechanization (MAHADM), tasked with promoting the rural economy. The government also launched the Agro -sylvo-pastoral Value Chains Support Program (SPVCSP) to enhance the competitiveness of agro-pastoral products in the market. Numerous initiatives involving the private sector have been implemented to modernize value chains and increase agricultural production, including farmer associations, cooperatives, SMEs, and investors. Despite the implementation of these various policies and the efforts of public institutions, it is evident that the current results do not meet the growing market demands, and certain challenges persist, such as limited market access, expensive intermediaries, and logistical difficulties. To support these different structures, whose ambition is to increase visibility and expand the market for agricultural products in Burkina Faso, the current project has turned to "Designing an E-commerce platform for the sale of agricultural products." The project aims to apply the computer skills acquired over three years of education in programming to create an E-commerce tool for product distribution.

This study is structured into two main parts: a theoretical part and a practical part. The first part covers general information and consists of two chapters:

- Chapter 1 deals with general information about the project
- Chapter 2 addresses different methodologies

The second and final part focuses on practical aspects and also comprises two chapters:

- Chapter 1 deals with modeling and conceptual approach
- Chapter 2 covers project implementation, results, and analysis.



PART I : THEORETICAL STUDY

PART I : THEORETICAL STUDY

CHAPTER I : GENERAL INFORMATION

I - Context, Problematic

1. Context

Located in the heart of West Africa with a galloping demography, the majority of the population is of rural origin with modest incomes. Burkina Faso is one of the countries where the poverty rate is close to the tolerable threshold. Its economy is essentially based on agriculture and livestock. Agriculture occupies a prominent place in the economy. The majority of the Burkinabe population depends on agriculture for their livelihood, and the agricultural sector contributes significantly to the country's gross domestic product (GDP). Provides employment and income to 80% of the population. Feeding branch of the whole nation, agriculture does not feed its man. Their problems are specific and multifaceted. In times of plenty, the conservation and processing of products pose a problem and farmers are often forced to sell off the cost of products so as not to see them rot or to meet urgent needs. Very often they have no idea of the cost price of their product to the final consumer and also of the precise needs of the consumer. We then see that the sale is not well framed for their benefit and that of the consumer. How to improve this situation? That is to say, to sell well. Agricultural cooperatives play an important role in the marketing of agricultural products. This allows them to have more weight in the market and to access larger distribution channels. Indeed, although important for the country, livestock farming remains extensive. According to official statistics, in 2014, the herd numbered approximately 9.09 million cattle, 9.27 million sheep and 13.89 million goats. There were also about 2.34 million pigs and 35.80 million poultry (INSD, 2015). Despite these constraints, Burkina Faso is full of significant agricultural potential. It will therefore be necessary to work to develop this sector as well as possible in view of all the advantages it brings and seeing as much population as possible to bring the economy of the country. Working to develop this sector means working to put all the chances on the side of Farmers, in order to increase the visibility and accessibility of agricultural products and the adoption of production techniques resulting from research and local know-how. In the context of earning a computer science degree in computer science, a programming option, this study was geared towards the agriculture sub-sector to apply the programming skills learned over the course of three years training to contribute to the development of this sector by participating in the marketing of agricultural products.

2. Problematic

While policies have been initiated by the government to address the problems in this sector, actors still face significant obstacles when it comes to selling these agricultural products. These obstacles are justified by a lack of market information, inadequate storage and preservation infrastructure, and limited financing. The key issue to be resolved here is the absence of direct contact between local farmers and potential buyers, leading to low visibility and accessibility of agricultural products. Two main factors contribute to this underperformance: Farmers may lack information about market trends, and unstable climatic conditions can impact agricultural production, thereby reducing the availability of products for sale.

II - Objectifs, Expected results

1. Objectives

The overall objective of this study is to promote agricultural and rural development and address the issues faced by this project through a system for connecting various stakeholders via a platform, allowing everyone to have a comprehensive view of each other's needs and respond accordingly. In Burkina Faso, this aims to increase farmers' income by enhancing the supply to rapidly expanding urban food markets through the sale of agricultural products via an e-commerce platform. More specifically, the following objectives are among the goals:

- Expand the customer base and reach new markets.
- Promote transparency and product traceability.
- Optimize the supply chain.
- Enhance the visibility and accessibility of agricultural products.

Achieving these diverse objectives would enable consumers to access products at lower costs while contributing to increasing producers' income, fostering growth in agricultural products, and boosting the country's economy.

2. Expected results

Visibility has been increased, and agricultural products are accessible. The clientele has been expanded, and new markets have been reached. Transparency and traceability of products have been promoted. The supply chain has been optimized.

III - Presentation of the agricultural sector in BF

1. Overview of the sale of farm product systems

The systems for selling agricultural products are diverse and vary from one region to another, much like in Burkina Faso, where both traditional and modern channels exist. Local markets, which are generally found in urban and rural centers, co-operatives that allow farmers to group together for wholesale selling, negotiate better prices, and access processing and storage services, as well as agricultural fairs that occasionally provide networking and meeting opportunities among various actors in the agricultural value chain. These fairs also offer limited promotion of local products and facilitate easy but limited trade exchanges. Poor preservation and inadequate storage conditions also restrict farmers' ability to sell their products at the right time and price. Lack of market information and unpredictable climate changes can also impact agricultural production. The e-commerce platform for selling agricultural products in Burkina Faso aims to create an environment conducive to the growth of the agricultural sector, empowering local farmers, and meeting consumer needs for fresh and quality agricultural products. This initiative holds the promise of promoting the country's economic development while improving farmers' livelihoods and providing consumers with a convenient and transparent shopping experience. Burkina Faso also exports certain agricultural products such as cotton, shea, sesame, and mangoes, as well as other products like gold, zinc, cashews, and iron bars. The table below illustrates a part of the dataset from INSD [4]

| Products\years | 2015 | 2016 | 2017 | 2018 | 2019 | Part en 2019(%) |
|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------------|
| Total export | 1311234,8 | 1499274,7 | 1689353,1 | 1815851,7 | 1910638,0 | 100,0 |
| Non-monetary gold | 767976,5 | 918701 ,7 | 1085107,6 | 1187892,1 | 1329152,5 | 69,6 |
| Cotton not carded or combed | 169412, 3 | 236456,7 | 195280,3 | 176969,0 | 206119,9 | 10,8 |
| Zinc in raw form | 32699,2 | 53546,9 | 95817,9 | 103710,0 | 90870,1 | 4,8 |
| Cashew nuts in shell | 49336,4 | 61376,7 | 93278,9 | 109878,1 | 47445,2 | 2,5 |
| Sesame seeds | 99875,4 | 67415,3 | 59024,0 | 71069,4 | 41332,5 | 2 ,2 |
| shear almond | 21901,5 | 22604,4 | 17864,4 | 23169 ,6 | 38983 ,6 | 2,0 |
| Shea Butter | 5378,9 | 6392,3 | 7196,9 | 12428,8 | 18611,2 | 1,0 |
| Mango | 6327,3 | 8356,8 | 8918,4 | 13323,2 | 13673,7 | 0 ,7 |
| Cashew nuts without shell | 2198,8 | 5567,4 | 6279,2 | 7235,1 | 8342,1 | 0,4 |
| Iron or non-alloy steel bars | 231 ,2 | 276,8 | 497,0 | 5823,4 | 5299,1 | 0,3 |

Table 1 : Export of Certain Agricultural Products

2. The importance of agricultural sector

The agricultural sector plays a crucial role in Burkina Faso, both economically, socially, and environmentally. Here are some of the key reasons why the agricultural sector holds significant importance in the country:

Food Security: Agriculture is the cornerstone of food security in Burkina Faso. The vast majority of the population depends directly or indirectly on agriculture for sustenance. A thriving agricultural sector ensures access to adequate food for the population.

Livelihood: Agriculture is the primary source of livelihood for many Burkinabé, particularly in rural areas. Agricultural activities provide jobs and income for farmers and their families.

Development of an e-commerce platform

Economic Contribution: The agricultural sector accounts for a substantial portion of Burkina Faso's Gross Domestic Product (GDP). It significantly contributes to the national economy and overall country growth.

Exports: Certain agricultural products such as cotton, shea, and sesame are major exports for Burkina Faso. These agricultural products contribute to export earnings and the country's trade balance.

Rural Development: Agriculture plays a pivotal role in rural development in Burkina Faso. It promotes job creation, enhances local infrastructure, and strengthens the capacities of rural communities.

Climate Change Adaptation: Burkina Faso faces challenges related to climate change, including droughts and variations in precipitation. A sustainable and resilient agricultural sector is essential for addressing these challenges and ensuring food security in a changing climate context.

Biodiversity Conservation: Agriculture in Burkina Faso plays a role in biodiversity conservation by preserving the genetic resources of cultivated plants and animal breeds adapted to the local environment.

Poverty Reduction: By improving agricultural productivity and promoting agri-food processing, the agricultural sector contributes to poverty reduction by offering economic opportunities to rural populations.

Rural Employment: Agriculture is one of the primary sources of employment in rural areas of Burkina Faso. It helps retain the workforce in agricultural regions and reduces rural exodus. [5]

3. The constraints of the sale of farm product

Despite the numerous advantages mentioned above, the assessment of the agricultural sector in Burkina Faso reveals multiple constraints that limit its development. These constraints are mainly summarized as follows :

- **Market Access Difficulties:** Challenges in selling products, procuring goods, and obtaining credit due to remoteness (high costs) or a low number of operators.
- **Rigidity of Agricultural Supply:** Crop sales are often obligatory to meet purchase or debt repayment needs, and their volume is partly unpredictable due to their strong dependence on climate conditions, regardless of demand levels.

Development of an e-commerce platform

- **Agricultural Price Instability:** Price instability is inherent in agricultural activities due to the inflexibility of supply, seasonality, occasional demand seasonality, and the effects of public or private storage policies.
- **Unfair Price Formation:** Often, prices are formed unfairly, mainly because producers are isolated and have limited information, while buyers hold significant power (financial capacity and better access to information).
- **Frequent Quality Deception:** Quality deception is common and often disadvantages producers who, when isolated, cannot guarantee the quality of purchased goods (sanitary products, fertilizers, etc.).
- **Difficulty in Increasing Productivity:** Increasing land, labor, and production factor productivity is challenging as it often requires significant changes to production systems, leading to risks and producers' aversion to these risks and uncertainties that could impact their already low incomes and sometimes their food security.
- **Quality Improvement Challenge:** Improving quality is difficult as it requires agreements among all stakeholders in the production, processing, and marketing chain to ensure quality and benefit each party.

It's important to note that the translation might slightly vary depending on context and nuances.

IV - The different aspects of success of a breeding project

1. Infrastructure

An efficient inventory management system is crucial to track agricultural products, their availability, and stock levels. This will help manage orders, prevent stockouts, and ensure smooth delivery. Consider having a dedicated warehouse to store agricultural products before their shipment. Reliable delivery services should be in place to transport the agricultural products to customers. Integrate secure online payment options such as credit cards, electronic payment services, or digital wallets. Set up tracking and analysis tools.

2. Equipment

Inventory Management System, Logistics and Warehouse, Delivery Infrastructure, Online Payment System, Tracking and Analysis Tools, Packaging Materials, Security Equipment such as surveillance cameras.

V - Description of the solution and analysis of the existing

1. Description of the solution

This study aims to develop a mobile application, and its scope of application is within the livestock sub-sector in Burkina Faso. The developed solution will contribute to enhancing farmers' capacity through awareness, information, and training modules. A farmer can register on the application to access training or request assistance from a specialist agent in animal reproduction who is also registered in the system. The application will address the issues of inadequate training and monitoring for farmers, which are among the key constraints in this sector, and will aid the livestock sector in increasing its production. To achieve this, it would be prudent to develop a Minimum Viable Product (MVP) in the initial phase and have it tested by the target users. The MVP will allow us to focus solely on the simplest and most essential functionalities at the beginning of the project.

2. Analysis of the existing

After analysis, it is evident that there is an e-commerce platform for the sale of agricultural products, primarily focusing on off-season products in Burkina Faso. Farmers of cereal products typically face challenges such as lack of market access, insufficient price information, and difficulties in accessing financing. PEVPA, developed by a student from the BIT Institute, is a recommendation and decision support system for agriculture available on mobile devices.

CHAPTER II : PROJECT METHODOLOGIES

I - The modeling methodology

1. Concept of modeling an information system

The Information System (IS) is an organized set of resources that allows for the collection, storage, processing, and distribution of information, usually through a network of computers [6]. Modeling, on the other hand, involves analyzing and designing the information contained within the measurement of the structure of this information and structuring computer storage and processing [7]. Data modeling is a crucial step in problem design, involving the selection of a development process and choosing a development method or language to follow.

2. Modeling process

The management and handling of any IT project require the preliminary selection of an appropriate development process that can meet the functional, technical, and qualitative requirements of the project. There are numerous modeling processes, and the choice must be made based on the project's diverse needs. An adequate development method makes it possible to obtain a product that meets the users' needs and expectations. Unified Process (UP) is a generic software development method characterized by an iterative and incremental approach that clearly distinguishes project phases without providing model documents. The Two Tracks Unified Process (2TUP) proposes a Y-shaped development cycle that separates technical aspects from functional aspects. It emphasizes technology and risk management, following a V-model. It does not provide standard documentation.

As illustrated in Figure 2: the Y-process revolves around three (03) branches:

- The functional branch: which includes the following steps: capturing functional requirements and analysis.
- The technical branch: which includes the following steps: capturing technical requirements and generic designs.
- The system implementation phase involves merging the results of the other two branches. It includes the following steps: preliminary design, detailed design, coding, and integration

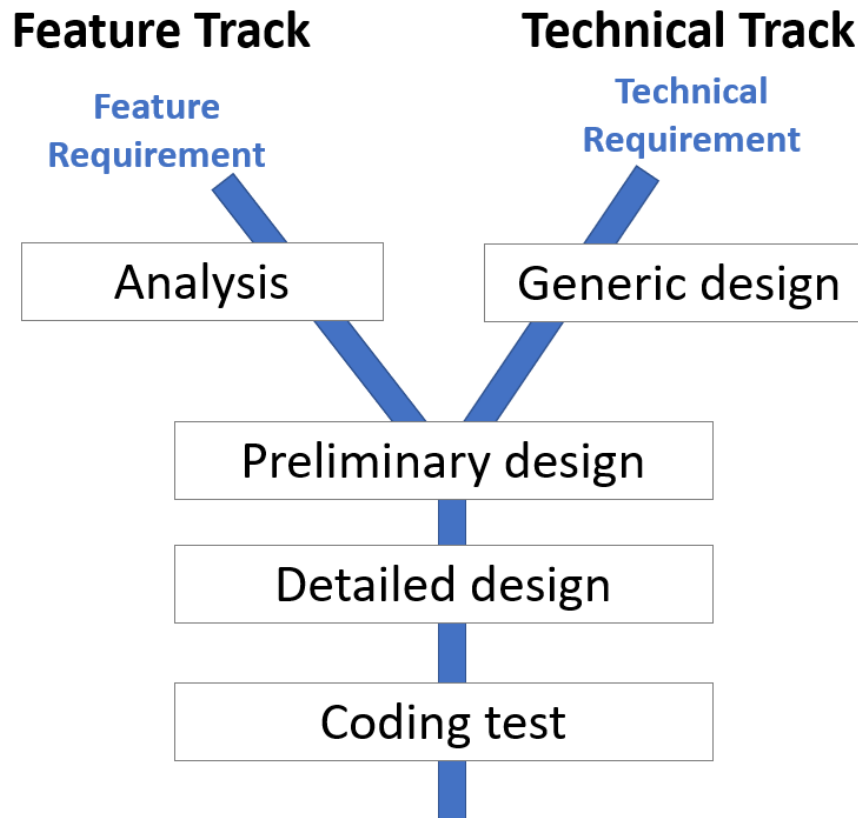


Figure 1 : The Y-process revolves

3. The modeling language

A modeling language is an artificial language that can be used to express information, knowledge, or systems in a structure defined by a set of rules [8]. Just as in modeling processes, there are several modeling languages. Among the modeling languages are: EXPRESS and EXPRESS-G, SysML, Business Process Modeling Notation, Energy Systems Language, IDEF, and Unified Modeling Language (UML). In this project, we are using the UML language for modeling, and we are employing three types of diagrams inspired by the MERISE method, among the 14 types of diagrams grouped into two main categories, as indicated in Zone 5 below.

These diagrams are :

- Use Case Diagram
- Class Diagram
- Sequence Diagram

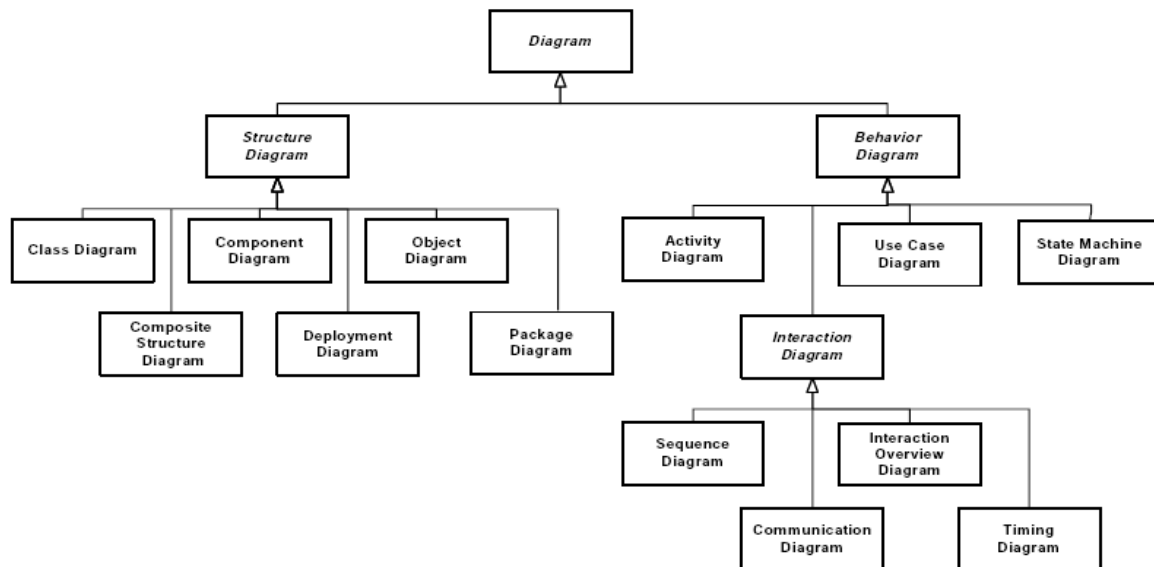


Figure 2 : Types of Diagrams Provided by UML

II - Development of an e-commerce Platform

1. Programing languages

A programming language can be defined as a communication code that allows a human to interact with a machine by providing it with instructions and analyzing hardware data provided by the system, typically a computer [9].

The world of computer programming is in constant evolution, and there are indeed more than 600 programming languages [10]. The following figure shows the market share of the world's most popular programming languages based on the Programming Language Popularity (PYPL) in January 2019

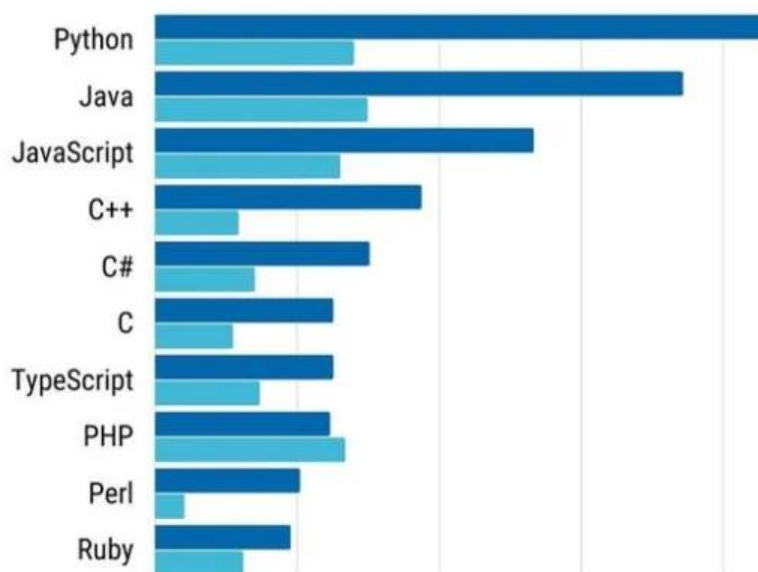


Figure 3 : Classification of Programming Languages

Development of an e-commerce platform

To choose a programming language for a given project, you need to ask the right questions to determine the most suitable language. Firstly, it's essential to clearly understand the type of development that fulfills the project's requirements: is it a web page? a mobile application? or a desktop software? These questions guide a programming team towards the appropriate language since each goal corresponds to a specific language. For this project, the objective is to develop an e-commerce platform, so a language suitable for e-commerce platform development will be used

2. State of the art of development an e-commerce Platform

E-commerce platforms are sales tools that enable future sellers to manage their business through a dedicated website and interface for e-commerce [11]. The utilized web servers can range from Nginx, Apache to Microsoft IIS. Users also have the option to employ any operating system (Windows, Linux, or Mac). It goes beyond a mere domain [12]. Indeed, there are various ways to create a platform, the most common being Python, HTML/CSS, and JavaScript. The platform to be developed in this project is an e-commerce platform, hence the language to be used must meet the requirements of an e-commerce platform

3. Programming language of plateforme e-commerce

Several languages can be used to develop a platform, and the most well-known and used ones are Python, HTML/CSS, but we will choose Python and HTML/CSS for the development of our platform. Python is an interpreted, multi-paradigm, and cross-platform programming language that can be used in various contexts and adapts to all types of usage through specialized libraries [13].

A Framework is a set of tools that simplifies a developer's work. Django is a very popular web framework for the Python language, widely used by companies around the world: Mozilla, Instagram, and even NASA have adopted it. Its MVT (Model-View-Template) functionality is directly inspired by the widely known MVC pattern. Django autonomously manages receiving requests and sending responses to the client (controller part).

jQuery is a free, open-source, cross-platform JavaScript library. Compatible with all web browsers (Internet Explorer, Safari, Chrome, Firefox, etc.), it was designed and developed in 2006 to facilitate script writing.[15]

Bootstrap is a [free, open source front-end](#) development framework for the creation of websites and web apps. Designed to enable [responsive](#) development of [mobile-first](#) websites, Bootstrap provides a collection of syntax for template designs..[16]



Figure 4 : The different programming language

| Main Architecture | MVC/MVT | Flux and Redux |
|-----------------------|--|---|
| Created by | Guido van Rossum in 1989/ Adrian Holovaty and Simon Willison | Facebook |
| Learning Curve | Easy to learn | Easy to use, especially with prior knowledge |
| Ecosystem | Mature, powerful 84% of developers use it as their main programming language Presence of many third-party libraries and Django packages for specific functionalities | Reasonably mature, widely used in production by several companies |
| Advantages | High productivity. Comprehensive framework, active community, secure, integrated ORM. Syntax remains simple, and the code can be highly readable. Rapid application development. | Easy to master, optimized performance for time-saving. |
| Disadvantages | Its Python isn't suitable for all tasks. Flexibility is limited in some cases by Django. Django is best for very simple projects. It's a "high-level" language. Hence, it's not adequate for system-level programming. | Slow adoption of the latest features. Difficult to debug, relatively complex user interface |

Table 2 : Description of Python with Django and JavaScript with React

III - The databases

1. Concept of a database

A database (referred to as "db" for convenience) is a collection of organized information designed to be easily searchable, manageable, and updatable.[17] Within a database, data is organized into rows, columns, and tables. They are indexed to allow for easy retrieval of desired information using computer software. Whenever new information is added, data is updated, and occasionally removed. There are several types of databases:

SQL Database (Relational): Relational databases were invented in 1970 by E.F. Codd of IBM. Relational databases consist of a set of tables. Within these tables, data is categorized. Each table has at least one column corresponding to a category. Each column contains a certain amount of data related to that category. SQL is used to manipulate this data.

NoSQL Database: Next Generation Database Management Systems mostly addressing some of the points: being **non-relational, distributed, open-source** and **horizontally scalable**. [18].

ORM (Object-Relational Mapping): Object-relational mapping (ORM) is a type of computer program that acts as an interface between an application program and a relational database to simulate an object-oriented database. This program defines mappings between the database schemas and the application program's classes. It could be described as "a layer of abstraction between the object world and the relational world." Due to its functionality, this type of program is found in many frameworks as an ORM component that has either been developed or integrated from an external solution [19]

2. Database for a web development

For our platform, we have chosen a relational database MySQL (which is the most commonly used). ORM is a highly flexible system that allows for the conversion of tables in the database into objects and vice versa, enabling us to work directly with objects without writing queries.

However, there are other options such as Microsoft SQL Server, PostgreSQL, SQLite, and Oracle Database.

The schema is illustrated in the following figure: It is a highly flexible system in Django that fits seamlessly into the MVT architecture we described earlier.

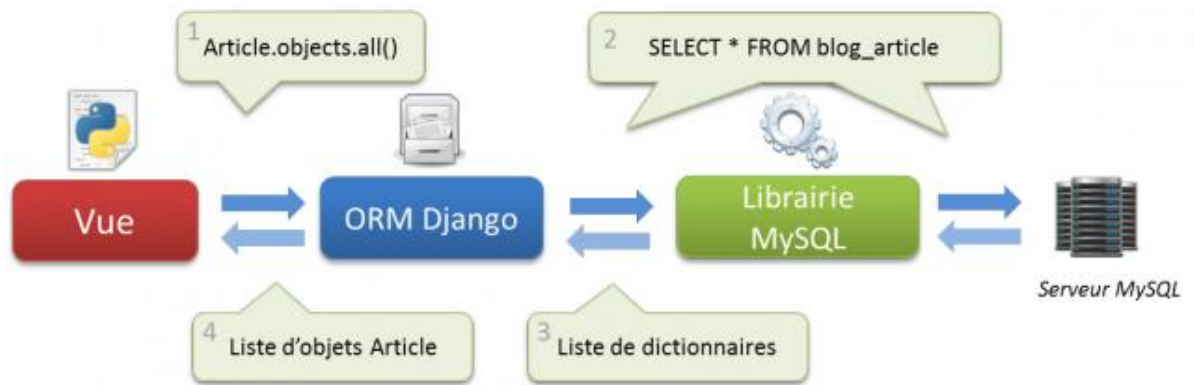


Figure 5 : Django ORM System and MySQL

IV - Project planning

1. Planning concept

Project planning is a crucial phase in the lifecycle of a project. It is the activity of determining and sequencing project tasks, estimating their efforts, and allocating the necessary resources to accomplish them. Planning enables a project's success, particularly under time and deadline constraints.

2. Gantt chart

The Gantt chart is a task planning tool used for the execution of a project, regardless of the industry. It provides a clear and concise visualization of the project's task progress, allowing for the planning and tracking of human and material resources requirements, thereby facilitating project monitoring.

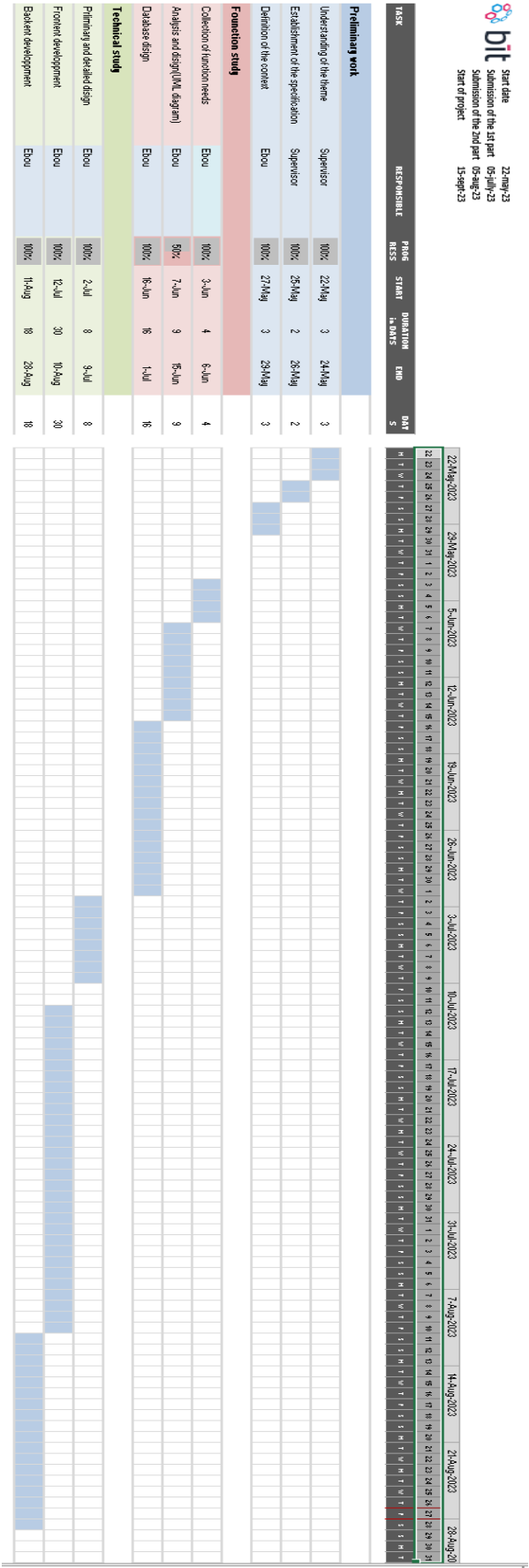


Figure 6 : Gantt diagram



PART II : DESIGN AND IMPLEMENTATION

PART II : DESIGN AND IMPLEMENTATION

CHAPTER I : MODELING AND DESIGN

I - Preliminary study

1. The preliminary study in the Y process

This is the very first step of the 2TUP process to consider. It involves firstly clearly defining the main lines of the project, and secondly, making an initial identification of the functional and operational needs, primarily using text or simple diagrams. These two steps are followed by the identification of stakeholders and the design of the context diagram. The preliminary study prepares project developers to properly address the activities of the two branches of the 2TUP process: Touch (Capturing functional requirements and capturing technical requirements).

2. Présentation of the project

This is an e-commerce platform for the sale of agricultural products. The project will enable farmers to showcase their products, increasing visibility and accessibility to reach a wider audience. They will also be able to establish direct relationships with consumers.

Technically, the following outcomes are expected at the end of the project:

- Have a database representing the storage part of information regarding farmers and the product catalog.
- Ensure platform security through mandatory authentication of all actors.
- Facilitate real-time collection, analysis, and tracking of registered item data.
- Have a personalized administration module that allows users to add and modify items

3. Initial collection of functional and technical equipments

The main functionalities of our system are as follows:

UserStory1: As a user, one should be able to create an account on the platform.

UserStory2: As a user, one should be able to search for specific agricultural products.

UserStory3: As a user, one should be able to browse through different categories of agricultural products.

UserStory4: As a customer, one should be able to add products to their shopping cart.

UserStory5: As a customer, one should be able to provide delivery details and finalize their order.

UserStory6: As an administrator, one should be able to provide secure payment options for users to complete their transactions.

UserStory7: As a user, one should be able to view the site, leave comments, and provide ratings on agricultural products.

UserStory8: As a user, one should be able to manage their profile, personal information, delivery addresses, and preferences.

UserStory9: As an administrator, one should be able to provide users with a way to contact customer support for assistance or questions.

UserStory10: As an administrator, one should allow producers to view the status of their available agricultural product stocks for sale.

UserStory11: As an administrator, one should be able to manage orders: Provide producers with a dashboard of order statuses, their products, shipments, and notifications to customers.

UserStory12: As an administrator, one should be able to analyze data: Provide analysis tools to track product performance, customer preferences, etc.

UserStory13: As an administrator, one should be able to promote sales by allowing producers to offer special deals on their agricultural products and enabling users to receive recommendations and share products on social media.

In addition to fundamental needs, our future system must meet the following criteria:

- Performance: Software must be performant, meaning that it should optimally meet all user requirements through its functionalities.
- Usability: The future software should be user-friendly. User interfaces should be attractive, simple, ergonomic, and adapted to the user.

4. Description of the context

In this diagram, we have 4 actors:

- A visitor who is not registered on the platform but can perform basic actions such as signing up, browsing the catalog, viewing a producer's space, etc.
- A customer is a registered user who can, among other things, log in, search, and modify their profile.
- A producer is the backbone of the system; they can add and delete products and authenticate themselves.

Development of an e-commerce platform

- The administrator, as the name suggests, ensures the proper functioning of the system and also serves as a moderator; they can delete posts and ban users.

The following tables (4, 5, 6, and 7) present the different actors and the various permissions that the system grants to each of the

| Actor 1 | Description of Functional Requirements |
|----------|---|
| Visitors | <p>The system provides a visitor with the ability to:</p> <ul style="list-style-type: none">• Browse the list of products.• Perform searches.• View product details.• Add products to the cart.• Create a user account to access additional features. |

Table 3 : Presentation of the actor 1 and his messages

| Actor 2 | Description of Functional Requirements |
|---------|--|
| Client | <p>The system provides a client with the ability to:</p> <ul style="list-style-type: none">• Create a client account.• Log in.• Log out.• Update account information.• View order history.• Add products to the cart.• Complete the purchase.• Leave comments on products and track the status of ongoing orders. |

Table 4 : Presentation of the actor 2 and his messages

| Actor 3 | Description of Functional Requirements |
|----------|--|
| Producer | <p>The system provides a producer with the ability to:</p> <ul style="list-style-type: none"> • Create a producer account. • Register as a seller or agricultural product producer. • Add products for sale. • Update product information. • Manage received orders from customers. • Manage available stock quantities of products. |

Table 5 : Presentation of the actor 3 and his messages

| Actor 4: | Description of Functional Requirements |
|----------------|---|
| Administrator: | <p>The system provides an administrator with the ability to:</p> <ul style="list-style-type: none"> • Manage the system. • Manage user accounts (clients, producers, etc.). • Verify and approve new producer accounts. • Manage product categories. • Supervise comments left by clients. • Manage technical and security aspects of the system. |

Table 6 : Presentation of the actor 4 and his messages

II - Functional study

1. The functional study in the process

The functional branch (or left branch) of the 2TUP process aims to specify the constraints by capturing the functional requirements and analyzing the specifications to determine what the system will actually achieve. It is in this branch that project stakeholders take care to identify and extract all the system functionalities to be implemented.

2. Capture of functional requirements

The objective of capturing functional requirements is to identify and describe various use cases of the system. A use case describes the behavior of a system under various conditions in response to a user's (or an actor's) request to achieve a specific goal. The different tables below present a detailed description of some identified use cases.

Use Case: Authentication

| Actors | Users |
|------------------|---|
| Description: | This use case concerns the user authentication process to allow them to access their personal account and associated functionalities. |
| Preconditions: | Must be registered beforehand |
| Main Scenario: | <ol style="list-style-type: none">1. The system displays the authentication page.2. The user fills out the form and submits it.3. The system checks in the database if the user is registered.4. The user is redirected to the homepage. |
| Extensions: | If the login credentials are incorrect, the system displays a message of authentication failure and prompts the user to check their information and try again |
| Post-conditions: | Successfully logged in. |

Table 7 : Description of the use case "Authentication"

| Actors: | Producer |
|-----------------|---|
| Description: | This use case concerns the process of adding a product by a producer. |
| Preconditions: | The producer must be logged in. |
| Main Scenario: | <ol style="list-style-type: none">1. The system displays the product creation page (form).2. The user fills out the form and submits it.3. The system verifies that the form is filled out correctly.4. The system records the new product in the database.5. The system displays a confirmation message. |
| Extensions: | If the provided information is invalid or incomplete, the system displays an error message. The producer can correct the product information and submit the form again |
| Post conditions | New product added. |

Table 8 : Description of the use case "Add product"

| Actors | Client |
|------------------|--|
| Description | This use case involves the process of user registration on the platform to allow them to create a personal account and access the features. |
| Preconditions | None. |
| Main Scenario | <ol style="list-style-type: none"> 1. The system displays the registration page. 2. The user fills out the form and submits it. 3. The system performs input validation. 4. The system checks the database to ensure the user does not already exist. 5. The system records the new user in the database. 6. The user is redirected to the corresponding page. |
| Extensions | If the provided information is invalid or incomplete, the system displays an error message indicating the necessary corrections. |
| Post-conditions: | Successful registration on the platform. |

Table 9 : Description of the use case "registration"

3. Analysis and design

Regardless of the project type, a software project, like any other, requires an analysis phase followed by a design step. The initial focus is to thoroughly understand and accurately describe the needs of users or clients. What do they want to achieve with the software? What features do they desire? For what purpose? How should the actions function? This is referred to as "requirements analysis." Once our understanding of the requirements is validated, we start envisioning the solution. This is the solution analysis part. This phase involves deepening the understanding of the system's context through an ongoing process of information gathering. Next, it entails identifying the major drawbacks of the current management approach, listing potential IT solutions to address encountered challenges, and then, through the needs analysis, examining the main expected objectives of the future system to be designed, depicted by the use case diagram. Lastly, while considering available resources, we propose the solution that seems most suitable.

Development of an e-commerce platform

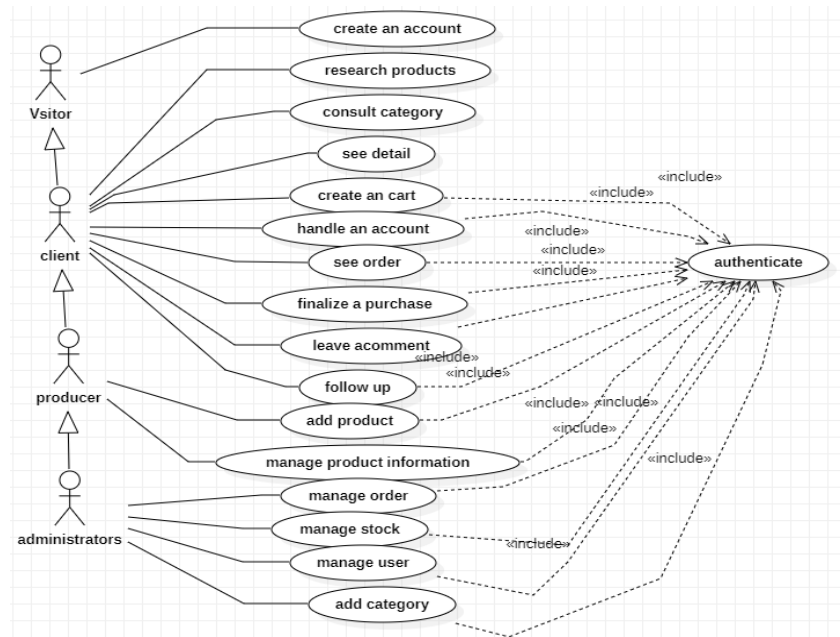


Figure 7 : The use cases diagram

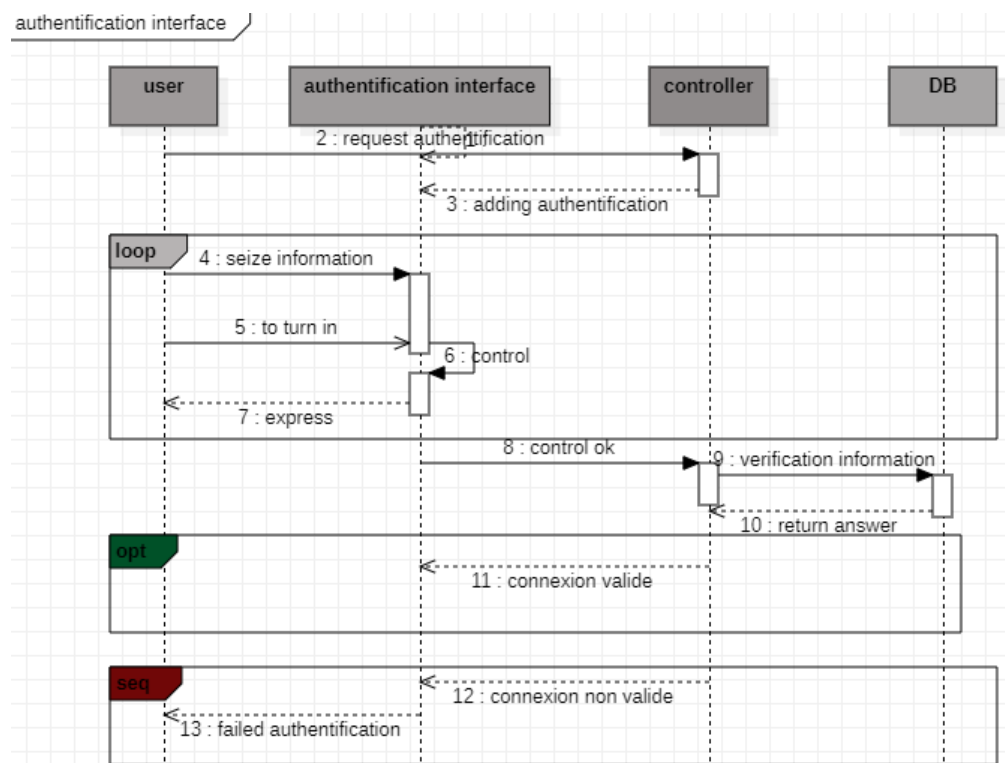


Figure 8 : Sequence diagram' authentication

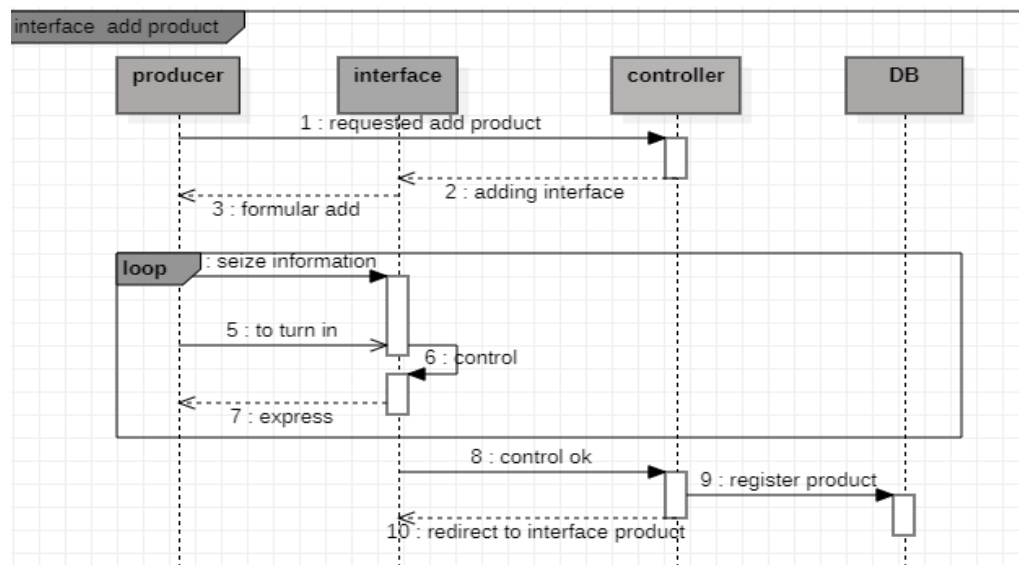


Figure 9 : Sequence diagram'interface add product'

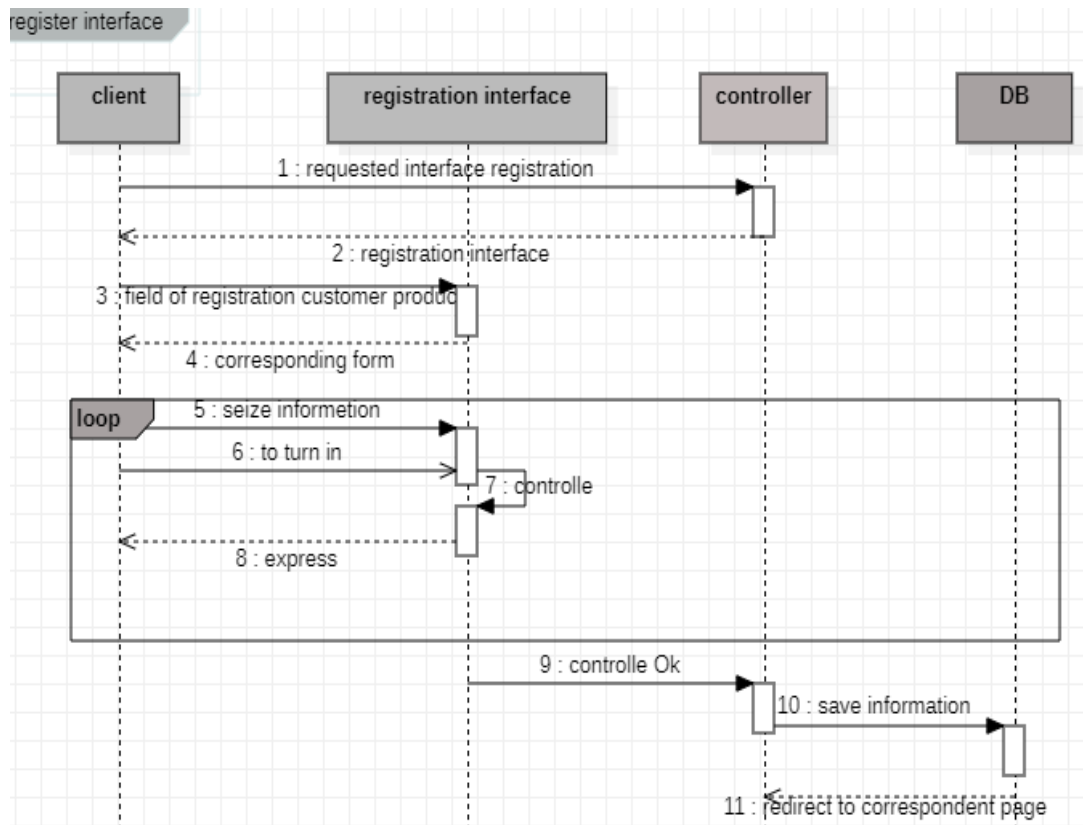


Figure 10 : Séquence diagram'register interface

III - Technical study

1. The technical study in the process

Overall, the technical branch of the 2TUP process aims to handle the technical aspects of development, manage associated risks, and ensure that the platform is designed, developed, and tested effectively and in line with the requirements and specifications. This is done while being responsive to changes and adjustments that might occur as the project progresses.

2. Capturing technical requirements

A PC mini type laptop with a Windows 10 64-bit operating system, equipped with an Intel Core i3 processor and 4 gigabytes of RAM. A MySQL Relational Database Management System (RDBMS) implemented with XAMP: for the application's database. Visual Studio Code: used for code editing. StarUML: used for modeling UML system diagrams.

3. Generic design

Generic design is the final step of the right branch of the 2TUP process. In this step, it is recommended to create a prototype to get an idea of the interfaces and functionalities of the platform. This part emphasizes the design aspect of the platform. It's necessary to define the colors, font styles, and shapes and create the template for the main pages of the platform. Creating flexible and reusable solutions that can be applied to different situations is important. This can enhance development efficiency, reduce costs, and facilitate long-term maintenance.

CHAPTER II : IMPLEMENTATION AND RESULTS

I - Implémentation of the solution

1. Implémentation in the process

The implementation phase represents the final branch (the middle branch) of the 2TUP development process and involves merging the outcomes of the functional branch with those of the technical branch. The objectives of the final branch of the 2TUP process are primarily to materialize the design model into application layers and human-machine interfaces (HMI), and then to test the final product at the end of the work in order to assess the objectives and compare the achieved results with the expected ones. This part consists of five (5) main stages: preliminary design, detailed design, coding, testing, and deployment

2. The preliminary design

This is the very first step of the middle branch of the 2TUP process. Indeed, it is from this step that the fusion of functional and technical studies begins. Several activities need to be carried out, and it is the opportunity to define the various HMIs through which users will interact with the system components. The different HMIs of the application obtained at the end of this study are presented in the table 9 below.

3. The detailed design

a. Classes identification

This activity mainly involves designing the classes, associations, and attributes. An analysis has identified a total of ten (10) classes for this project, which are: "User", "Producer", "Product", "Administrator", "Client", "Order", "Category", "Cart", "OrderLine", "Comment".

b. The classes diagram

The class diagram allows representing the relationship between modeling elements. The different entities (which are classes) of the application are connected by associations that have multiplicities depending on the case. Developing the class diagram is a crucial step in the database design process. Based on the study of the existing system and the various use case diagrams, we were able to identify the main classes illustrated in the figure below to have a clearer view of the system under study. From this diagram, the corresponding database entities are derived in the platform to be developed.

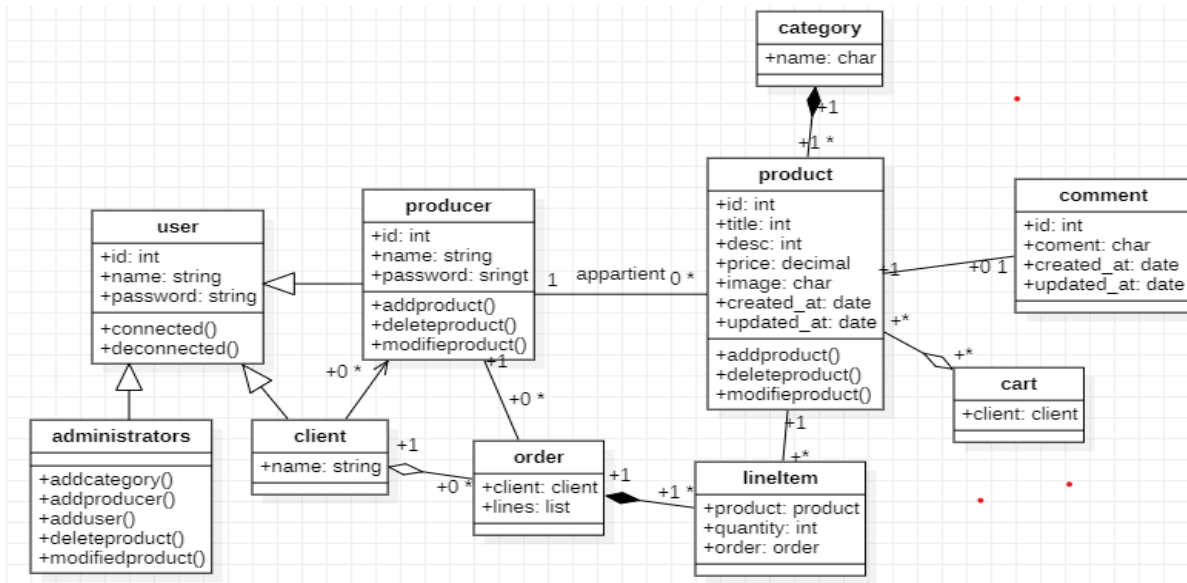


Figure 11 : Class diagram

II - Coding and test

1. Explanation of how the code works

The models.py file is used to define model classes, which represent the entities and data that the application will interact with. Each model class typically corresponds to a table in the database. The following figure (Figure 4) illustrates the different classes:

```

blog > models.py > ...
3 from django.contrib.auth.models import User
4 from django.urls import reverse
5
6 # Modèle pour représenter un article
7 class Category(models.Model):
8     name=models.CharField(max_length=120)
9     def __str__(self):
10         return self.name
11
12 class Produit(models.Model):
13     user=models.ForeignKey(User,on_delete=models.CASCADE,null=True)
14     title = models.CharField(max_length=200)
15     category=models.ForeignKey(Category,on_delete=models.CASCADE)
16     desc = models.TextField()
17     price = models.DecimalField(max_digits=10, decimal_places=2, default=)
18     image=models.ImageField(upload_to='produit/', blank=True, null=True)
19     created_at = models.DateTimeField(auto_now_add=True)
20     updated_at=models.DateTimeField(auto_now=True)
21     def __str__(self):
22         return self.title
23
24 Produit.objects.all()
25 Produit.objects.filter(title__contains="cafe")
26 Produit.objects.filter(title__icontains="cafe")
27
28 def get_absolute_url(self):
29     return reverse("my-articles")
    
```

Figure 12 : Code model.py

The settings.py file contains the configuration parameters of the application, which allows customizing its behavior, functionalities, and environment. The figure 5 below shows the configuration of the different applications of the project.

```

34
35 INSTALLED_APPS = [
36     'django.contrib.admin',
37     'django.contrib.auth',
38     'django.contrib.contenttypes',
39     'django.contrib.sessions',
40     'django.contrib.messages',
41     'django.contrib.staticfiles',
42     'blog',
43     'django_extensions',
44     'app_auth',
45     'app_admin',

```

Figure 13 : Configuration code in setting.py

An Uniform Resource Locator (URL) is a reference or address used to access resources on the internet. In Django, the `urls.py` file contains the various URLs to which the application

```

app_auth > urls.py > ...
1 from django.urls import path
2 from .views import login_blog, register, logout_blog
3
4 urlpatterns = [
5     path('login/', login_blog, name='login-blog'),
6     path('register/', register, name='register'),
7     path('logout/', logout_blog, name='logout_blog'),
8 ]

my_blog > urls.py > ...
14 from django.contrib import admin
15 from django.urls import path, include
16 from blog.views import home, detail, search, sms
17 from django.conf import settings
18 from django.conf.urls.static import static
19
20 urlpatterns = [
21     path('admin/', admin.site.urls),
22     path('', home, name='home'),
23     path('produit/<int:produit_id>/', detail, name='detail'),
24     path('produit/recherche/', search, name='search'), # Correction ici
25     path('message-sms/', sms, name='sms'),
26     path('auth/', include("app_auth.urls")), # Ajout du slash ici
27     path('my_admin/', include("app_admin.urls")),
28 ] + static(settings.MEDIA_URL, document_root=settings.MEDIA_ROOT)
29

app_admin > urls.py > ...
1 from django.urls import path
2 from .views import dashboard, UpdateProduit, DeleteProduit, user_produit, AddProduit
3
4 urlpatterns = [
5     path('dashboard', dashboard, name="dashboard"),
6     path('my-articles', user_produit, name="my-articles"),
7     path('ajouter-produit', AddProduit.as_view(), name="ajouter-produit"),
8     path('update-produit/<int:pk>', UpdateProduit.as_view(), name="update-produit"),
9     path('delete-produit/<int:pk>', DeleteProduit.as_view(), name="delete-produit")
10 ]
11
12

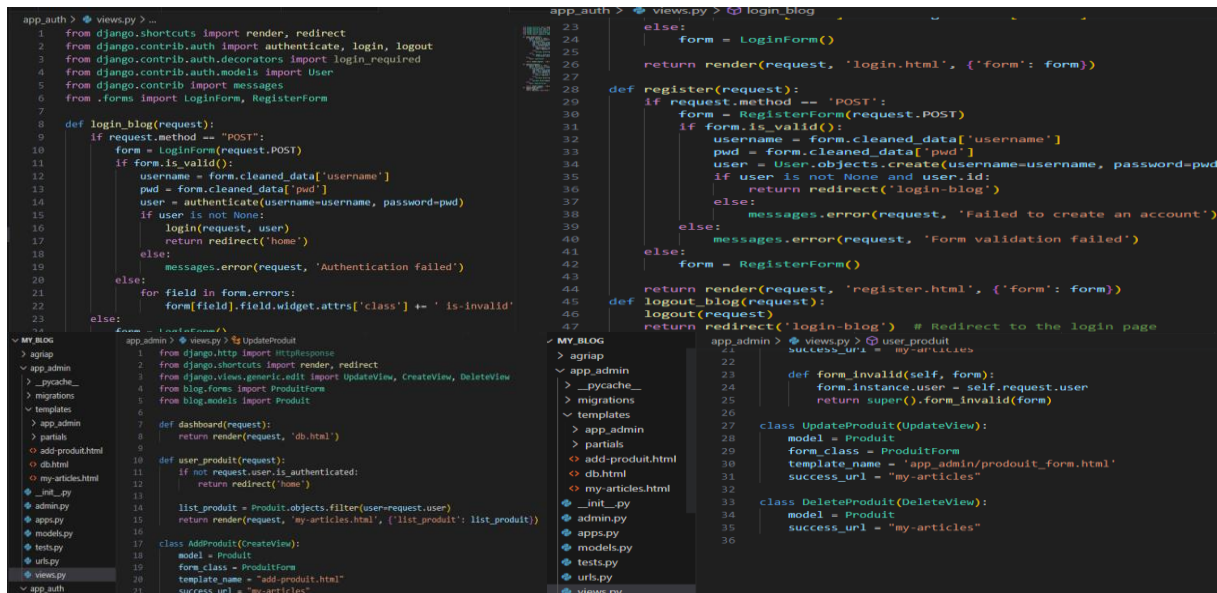
```

Figure 14 : The different urls

responds. It defines the mapping of these URLs to the appropriate views and handles how users interact with the application through their web browsers. It also manages parameters and redirections, playing a crucial role in structuring the application's navigation and user interactions on the web.

Development of an e-commerce platform

The views.py file serves as the bridge between the URLs defined in the `urls.py` file and the underlying business logic. This file is where views are defined, which are Python functions or classes responsible for handling HTTP requests, retrieving or manipulating data, and returning appropriate responses to users. The figure below illustrates the various Python functions and classes in our application

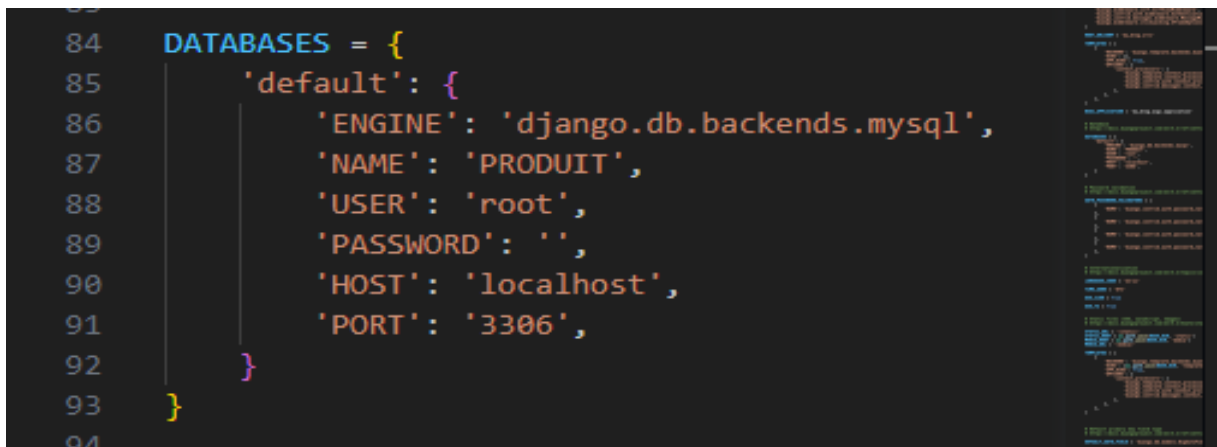


```
app_auth > views.py > ...
1 from django.shortcuts import render, redirect
2 from django.contrib.auth import authenticate, login, logout
3 from django.contrib.auth.decorators import login_required
4 from django.contrib.auth.models import User
5 from django.contrib import messages
6 from .forms import LoginForm, RegisterForm
7
8 def login_blog(request):
9     if request.method == "POST":
10         form = LoginForm(request.POST)
11         if form.is_valid():
12             username = form.cleaned_data['username']
13             pwd = form.cleaned_data['pwd']
14             user = authenticate(username=username, password=pwd)
15             if user is not None:
16                 login(request, user)
17                 return redirect('home')
18             else:
19                 messages.error(request, 'Authentication failed')
20         else:
21             for field in form.errors:
22                 form[field].field.widget.attrs['class'] += ' is-invalid'
23     else:
24         form = LoginForm()
25
26 app_admin > views.py > % UpdateProduct
1 from django.http import HttpResponseRedirect
2 from django.shortcuts import render, redirect
3 from django.views.generic.edit import UpdateView, CreateView, DeleteView
4 from blog.forms import ProductForm
5 from blog.models import Product
6
7 def dashboard(request):
8     return render(request, 'db.html')
9
10 def user_product(request):
11     if not request.user.is_authenticated:
12         return redirect('home')
13     list_product = Product.objects.filter(user=request.user)
14     return render(request, 'my-articles.html', {'list_product': list_product})
15
16 class AddProduct(CreateView):
17     model = Product
18     form_class = ProductForm
19     template_name = "add-product.html"
20     success_url = "my-articles"
21
app_auth > views.py > login_blog
23 else:
24     form = LoginForm()
25
26 return render(request, 'login.html', {'form': form})
27
28 def register(request):
29     if request.method == "POST":
30         form = RegisterForm(request.POST)
31         if form.is_valid():
32             username = form.cleaned_data['username']
33             pwd = form.cleaned_data['pwd']
34             user = User.objects.create(username=username, password=pwd)
35             if user is not None and user.id:
36                 return redirect('login-blog')
37             else:
38                 messages.error(request, 'Failed to create an account')
39         else:
40             messages.error(request, 'Form validation failed')
41     else:
42         form = RegisterForm()
43
44 return render(request, 'register.html', {'form': form})
45
46 def logout_blog(request):
47     logout(request)
48     return redirect('login-blog') # Redirect to the login page
49
app_admin > views.py > user_product
22 success_url = "my-articles"
23
24 def form_invalid(self, form):
25     form.instance.user = self.request.user
26     return super().form_invalid(form)
27
28 class UpdateProduct(UpdateView):
29     model = Product
30     form_class = ProductForm
31     template_name = "app_admin/product_form.html"
32     success_url = "my-articles"
33
34 class DeleteProduct(DeleteView):
35     model = Product
36     success_url = "my-articles"
```

Figure 15 : Different code of views

2. The database with MySQL

MySQL, which is a widely used open-source Relational Database Management System (RDBMS), is utilized to manage and retrieve data in our application. Figure 8 illustrates the configuration in the settings file:



```
84 DATABASES = {
85     'default': {
86         'ENGINE': 'django.db.backends.mysql',
87         'NAME': 'PRODUT',
88         'USER': 'root',
89         'PASSWORD': '',
90         'HOST': 'localhost',
91         'PORT': '3306',
92     }
93 }
94
```

Figure 16 : Configuration of database

III - Result of the interfaces



Figure 17 : Home page

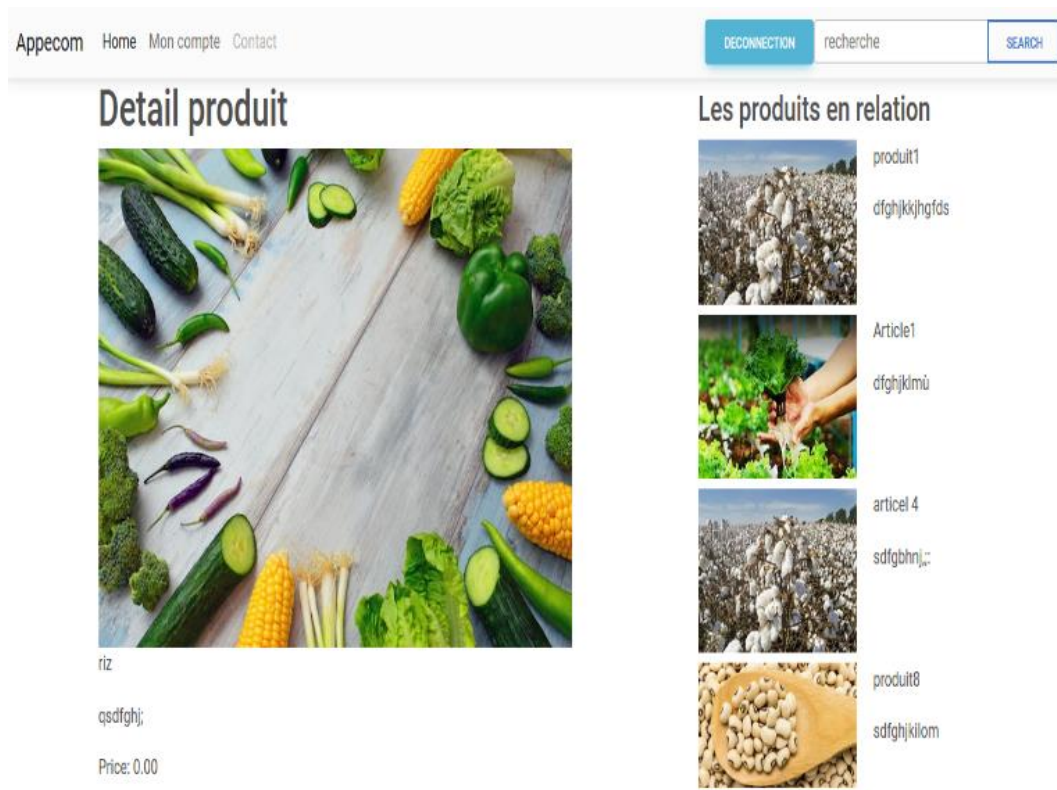


Figure 18 : Product detail page

Development of an e-commerce platform

Appecom Home Mon compte Contact

DECONNECTION recherche SEARCH

creation de compt

creation de compt

nom utilisateur:

mot de passe:

Mot de passe de confirmation:

CRÉE LE COMPT

| FOOTER CONTENT | LINKS | LINKS | LINKS | LINKS |
|--|--------|--------|--------|--------|
| Lorem ipsum dolor sit amet consectetur | Link 1 | Link 1 | Link 1 | Link 1 |
| adipiscing elit. Molestiae modi cum ipsam ad | Link 2 | Link 2 | Link 2 | Link 2 |

Figure 19 : Account creation Page

Appecom Home Mon compte Panier Contact Categorie

CONNEXION recherche SEARCH

Connexion au blog

Connexion au blog

Nom utilisateur

Mot de passe

SE CONNECTER

vous n'avez pas de compte ? [crée le compte](#)

| FOOTER CONTENT | LINKS | LINKS | LINKS | LINKS |
|--|--------|--------|--------|--------|
| Lorem ipsum dolor sit amet consectetur | Link 1 | Link 1 | Link 1 | Link 1 |
| adipiscing elit. Molestiae modi cum ipsam ad | Link 2 | Link 2 | Link 2 | Link 2 |

Figure 20 : connexion page

Development of an e-commerce platform

TDB accueil mes article nebie

saisi des produit

Title:

Category:

Description:

Image: No file selected.

| FOOTER CONTENT | LINKS | LINKS | LINKS | LINKS |
|--|--------|--------|--------|--------|
| Lorem ipsum dolor sit amet consectetur | Link 1 | Link 1 | Link 1 | Link 1 |
| adipiscing elit. Molestiae modi cum ipsam ad | Link 2 | Link 2 | Link 2 | Link 2 |

Figure 21 : Add product

Appecom Home Mon compte Panier Contact Catégorie

recherche

Liste de recherche

| FOOTER CONTENT | LINKS | LINKS | LINKS | LINKS |
|--|--------|--------|--------|--------|
| Lorem ipsum dolor sit amet consectetur | Link 1 | Link 1 | Link 1 | Link 1 |
| adipiscing elit. Molestiae modi cum ipsam ad, | Link 2 | Link 2 | Link 2 | Link 2 |
| illo possimus laborum ut reiciendis obcaecati. | Link 3 | Link 3 | Link 3 | Link 3 |
| Ducimus, quas. Corrupti, pariatur eaque? | Link 4 | Link 4 | Link 4 | Link 4 |
| Reiciendis assumenda iusto sapiente inventore animi? | | | | |

Register for free

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Figure 22 : List of research

CONCLUSION

The agricultural sector represents a significant portion of Burkina Faso's Gross Domestic Product (GDP). It plays a role in poverty reduction by improving agricultural productivity and promoting agro-food processing, offering economic opportunities to rural populations. It stands as a major source of employment in Burkina Faso's rural areas. It helps retain labor in agricultural regions and reduces rural migration. The development of the agricultural sector could make a substantial contribution to the national economy and the country's growth.

In order to support various initiatives aiming to increase visibility and expand the market for agricultural products in Burkina Faso, this end-of-studies project focuses on establishing an e-commerce platform for the sale of agricultural products in the country. The objective here was to address the issues of lack of visibility and market growth for agricultural products.

For the successful implementation of this project, preliminary tasks involved defining the project scope and planning the various key activities in precise detail. These initial tasks were vital and were rigorously followed. Following this preparatory work came the phase of analysis and design of the application using the 2TUP methodology, with the steps outlined in the second part of this report. This study provided an opportunity to apply the computer knowledge acquired during three years of training at BIT to contribute to the development of the agricultural sector in Burkina Faso. It proved valuable in deepening the understanding, on one hand, of the realities in the field of agriculture, and on the other hand, of the web development model. Indeed, it was an ideal opportunity to explore new technologies such as the Django Framework and the Python language, which are integral to modern web development.

In the end, the outcome of this work is a satisfying achievement. From the web design to the application itself, it has proven to be effective and is already addressing the set objectives defined at the start of the project, leading to the anticipated outcomes.

However, this project represents significant enhancements, and prospects for future versions of the platform can be proposed. The following functionalities could be added in future updates:

Implement algorithms to suggest similar or complementary agricultural products to users.

Development of an e-commerce platform

Provide analysis tools to track product performance and customer preferences.

Add a shopping cart to allow users to add products for purchase.

Enable users to participate in auctions for specific agricultural products.

Introduce multilingual support to enable users to navigate and transact in multiple languages.

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Web

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APPENDIX

Appendix I: Working folder on Vs Code

This figure shows the project working folder on Vs code.

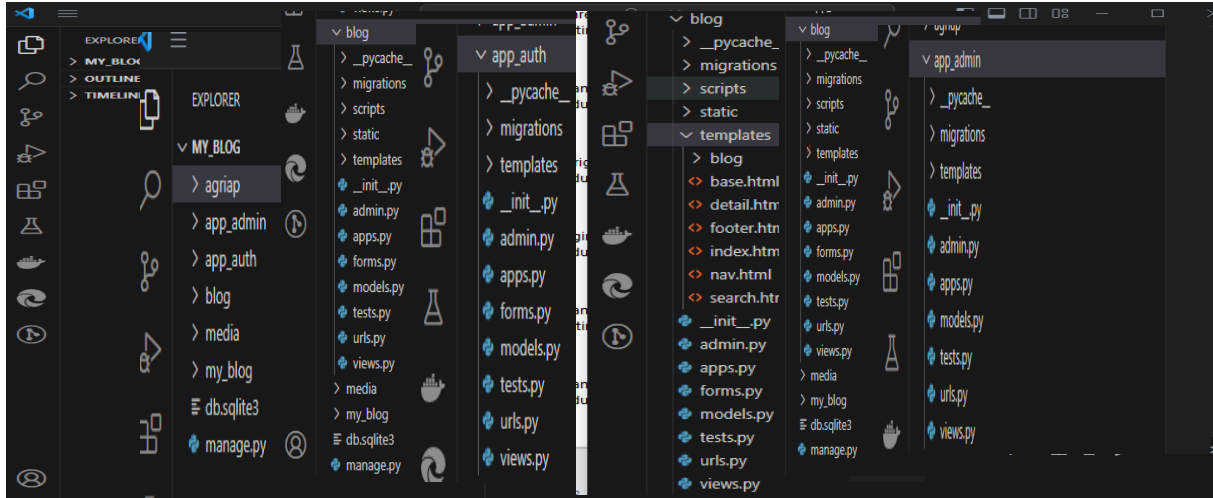


Figure 23 : Working folder on Vs code

The 'blog' application: the directory that contains the 'home' page

The 'app_auth' application: the directory that contains the 'login' and 'register' pages."

The 'app_admin' application: the directory that contains the dashboard."

The 'templates' directory: containing the HTML and Bootstrap code.

The 'my_blog' subdirectory contains the 'settings.py' file for various configurations within the project

The 'scripts' folder contains the JavaScript code.

The 'static' subfolder contains the Bootstrap files for the design.

The 'media' folder contains images and allows for their display.

The 'media' folder contains images and allows for their display.

Appendix II: Presentation of the project dashboard

A dashboard to display products registered in the database of an agricultural e-commerce platform in Burkina Faso should be user-friendly and informative. Here's an example of what such a dashboard might look like:

The screenshot shows a web application interface for managing articles. The header is teal and contains the text 'TDB Accueil Mes articles' on the left and 'admin' with a user icon on the right. The main content area is titled 'Mes articles' and features an orange button labeled '+ AJOUTER ARTICLE'. Below this is a table with three columns: 'Titre', 'Description', and 'Action'. The table contains five rows of data, each with a title, a description, and two action buttons (one blue with a left arrow and one red with a right arrow).

| Titre | Description | Action |
|-------------------------------------|----------------------------|----------------------------|
| Article N° #13 [REDACTED] | Description article N° #13 | [Left Arrow] [Right Arrow] |
| Article N° #14 | Description article N° #14 | [Left Arrow] [Right Arrow] |
| Jésus est mon ami de tous les jours | ----- | [Left Arrow] [Right Arrow] |
| Jus de citron | Je vends du jus de citron | [Left Arrow] [Right Arrow] |
| Tuto firebase | Tuto firebase | [Left Arrow] [Right Arrow] |

Figure 24 : Dashboard

Appendix III: The project's value proposition and revenue streams

- The project's value proposition

How is this project idea innovative, and what is its value proposition? These are two important questions to address. The target audience for this project is the farmers in Burkina Faso who are currently facing production challenges. The main causes of these challenges include their limited market growth and lack of visibility. To address their needs, it is essential to analyze the root causes of these problems and then find a solution. This solution is nothing other than an e-commerce platform.

The overall value proposition is to improve the livelihoods of farmers in Burkina Faso by providing them with an efficient means to market their products, offering educational support, and providing consumers with high-quality products. It aims to solve the issues of limited market growth and lack of visibility that farmers face while creating a transparent and beneficial experience for all stakeholders.

- Revenue streams

The objective behind any business idea is to generate revenue, and it's time to think about how this project could be profitable. To begin with, the platform will be launched in the market, and users will be able to test it for free. However, after one month of use, a user will then need project working folder on Vs Code to subscribe to continue enjoying the various services offered.