Republic of Tunisia

Ministry of Higher Education and Scientific Research

Private Higher School of Applied Sciences and Management

SUPERVISED PERSONNEL PROJECT

Team import TeamName

Efficient Market Analysis and Price Comparison through Web Scraping Technology

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COMPARINI

تي شكون أرخص ؟

Presented by :

Mohamed Adem Ben Moussa

Najla Abdelli

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SESAME University, July 29, 2023

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Supervised By :
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Abstract

Comparini is a web application that allows users to compare and explore a wide range of products. With a user-friendly interface, users can easily find products and access detailed information.

It provides a simple way to compare product prices across several marketplaces, which is designed to encourage educated purchase decisions. The program features a customisable dark and light look to fit personal tastes and supports the English and French languages.

Comparini makes sure to offer real-time price comparisons.

Keywords :
Comparini, web application, price comparison, product search, product details, user interface, multi-lingual support, dark theme, light theme, secure login, admin panel, provider management, real-time updates, web scraping, manual product addition, dynamic pricing, informed decisions, product categories, market analysis, data comparison, customizable preferences, intuitive design.

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Introduction

Comparini is an innovative web application designed to revolutionize the way users explore and compare product prices in various markets. With its user-friendly interface and cutting-edge features, Comparini empowers users to make informed purchasing decisions effortlessly.

At the heart of Comparini's functionality lies real-time price comparison, providing users with a comprehensive overview of product prices across diverse markets. This unique feature allows individuals to save time and money by identifying the best deals available.

The application's multilingual support, including English and French, ensures that users from different regions can seamlessly navigate and interact with the platform in their preferred language. Moreover, Comparini offers customizable dark and light themes, catering to individual preferences for a personalized browsing experience.

Designed using PHP, with support from JWT and jQuery AJAX libraries, and powered by XAMPP and UIkit for the backend and frontend, respectively, Comparini boasts a robust and secure infrastructure. Additionally, the use of web scraping technology ensures automatic updates of product information from large markets, while allowing manual product additions for smaller stores without a web presence.

Comparini's administration panel grants exclusive access to authorized users, providing a seamless interface to manage providers and their products efficiently. Admins can add, edit, and delete providers and products, ensuring the platform's data is accurate and up-to-date.

With its array of features, Comparini offers an unparalleled opportunity for users to access comprehensive product information and make confident buying decisions. From electronics to clothing and household items, Comparini equips users with the knowledge they need to find the best deals in the market.

Chapter I

The Private Higher School of Applied Sciences and Management

A Introduction

The primary focus of this initial chapter is to provide a comprehensive overview of the Private Higher School of Applied Sciences and Management. It involves a thorough examination and critique of the current state while also outlining the broader context and objectives of the application.
The final section will delve into justifying the proposed solution and discussing the technologies employed in crafting this platform.

B Presentation of the work environment

1 Description of SESAME

SESAME is a private higher education institution approved by the Tunisian State (Ministry of Higher Education) and located in the Elgazala technopole.

Figure I.1: SESAME - Private Higher School of Applied Sciences and Management

1.a Departments:

Sesame's departments are:

- SESAME Technology
- SESAME Business
- SESAME Executive

1.b SESAME Technology

SESAME Technology is divided into :

- Bachelor in engineering of embedded systems and IOT.
- Bachelor in computer sciences and Multimedia.
- Preparatory school for computer science engineering.
- Computer science engineering.

1.c SESAME Business

SESAME Business is divided into :

- Bachelor in management.
- Bachelor in finance bank insurance.
- Bachelor in behave sciences.
- Master degree in international logistics and purchasing.
- Master degree in international management.

1.d SESAME Executive

SESAME Executive is divided into :

- Computer science engineering.
- Training on demand.

C Context of the Project

The Comparini web application is a dynamic price comparison website designed to empower users with the ability to explore and compare product prices across multiple markets.
In the context of an ever-evolving digital marketplace, where consumers seek the best deals and value for their purchases, Comparini emerges as a powerful tool to streamline the shopping experience. With the growing availability of products across various markets, it becomes increasingly challenging for consumers to make informed decisions about their purchases. Comparini addresses this challenge by providing real-time pricing information and facilitating product comparisons from a diverse array of markets.

D Study and Critique of the Existing

Comparini was conceived in response to the growing demand for a more efficient approach to comparing prices. With the aim to alleviate the burden of physically visiting numerous markets to find the best deals, Comparini emerged as a user-friendly and time-saving price comparison website. By streamlining the process and presenting users with real-time price comparisons, Comparini empowers shoppers to make informed purchasing decisions from the comfort of their own devices.

E Proposed Solution

Comparini offers a comprehensive web application that revolutionizes price comparison for consumers. By harnessing web scraping technology, Comparini automatically updates product information from various markets, ensuring up-to-date and accurate data for users. The platform boasts an intuitive user interface, allowing users to effortlessly search for products and compare prices across multiple markets.

With support for multiple languages and customizable dark and light themes, Comparini caters to diverse user preferences. The secure login system enables administrators to efficiently manage providers and their products, facilitating seamless updates and maintenance.

Comparini also addresses the needs of small stores without an online presence. It allows manual product additions, ensuring inclusivity for businesses of all sizes. By providing a centralized hub for comparing prices, Comparini empowers users to make smarter purchasing decisions, ultimately saving time and money.

Chapter II

Requirements Analysis and Specification

A Introduction

In this chapter, our objective is to provide a comprehensive understanding of the application's context. This involves identifying the various actors involved and specifying both the functional and non-functional requirements of the project. The functional requirements will be depicted through a global use case diagram, and we will present a detailed list of expected features in the product backlog. Lastly, we will introduce the work environment, providing valuable insights into the overall project setup.

B Identification of Actors

In this section, we will identify and describe the various actors who interact with our application. These actors play crucial roles in the system's operation and user interactions.

C Requirements specification

Here, we will outline the functional and non-functional requirements of our application in detail. The functional requirements will describe the specific features and functionalities the application must possess, while the non-functional requirements will address the system's performance, security, and usability aspects.

1 Functional Requirements

This subsection will present a comprehensive list of the application's functional requirements. Each requirement will be described with clarity to ensure the application's effective performance and user satisfaction.

1.a User Requirements

- Users should be able to search for products based on keywords and categories.
- Users should be able to view detailed information about a selected product.

- Users should be able to compare prices of a product across different markets.
- Users should have the option to switch between English and French languages.
- Users should be able to toggle between dark and light themes for personalized viewing.
- Users should be able to access public content without the need for an account.

1.b Admin Requirements

- Registered admins should be able to log in securely to access their accounts.
- Admins should have the ability to add, edit, and delete product providers.
- Admins should be able to add, edit, and delete products offered by providers.
- Admins should have the authority to add, edit, and delete product categories and sub-categories.
- Admins should be able to manage the available languages for the application.
- Admins should have control over the dark and light themes available for users.

2 Non-Functional Requirements

Here, we will outline the non-functional requirements, including performance, security, and usability criteria. These requirements are essential to meet users' expectations and maintain the application's reliability.

- Easy Usability : The application must be easy to use.
- Efficiency of use : Logic between the interfaces and the set of links to ensure fast navigation.
- Availability : When any user wants to view the app, it must be available.
- Response time : The response time should be as short as possible.
- Secured : The application must be secured.
- Reliability.
- Low perceived workload.

D Use Cases Diagram

In this section, we will provide a visual representation of the application's interactions with its users through a use case diagram. This diagram will help illustrate the various use cases and how they relate to different actors.

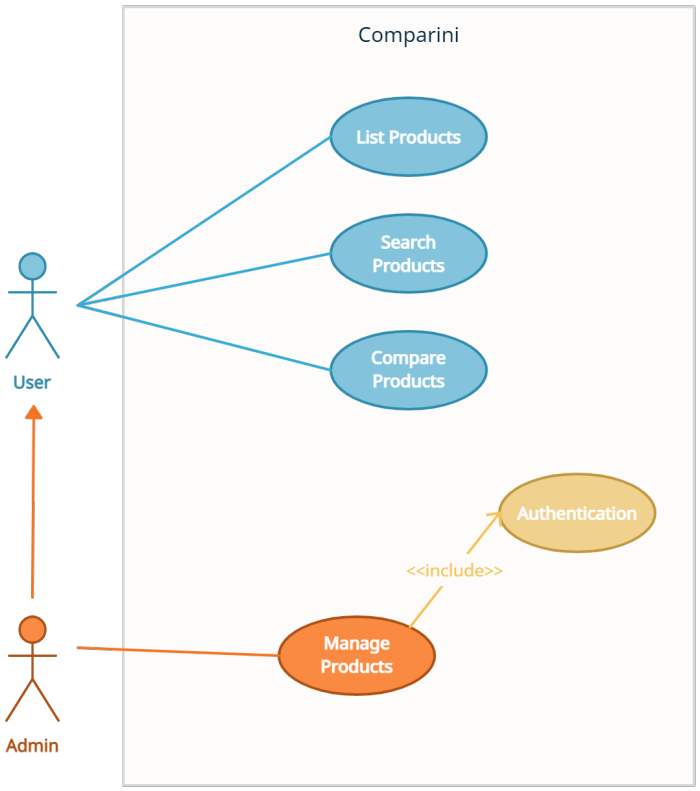

Figure II.1: Class Diagram

E Textual Description of the Use Cases

We will provide a textual description of each use case presented in the use case diagram. This will offer a detailed explanation of the application's functionalities and how users can interact with it.

F Class Diagram

The class diagram will illustrate the relationships and hierarchies between the classes in our application. This diagram will provide an overview of the system's structure and organization.

G Sequence Diagrams

In this section, we will include sequence diagrams that showcase the interaction between different components and actors during specific scenarios. These diagrams will help visualize the flow of events and interactions within the application.

H Conclusion

This chapter concludes the requirements analysis and specification phase of our project. By identifying the actors, defining functional and non-functional requirements, and pre-

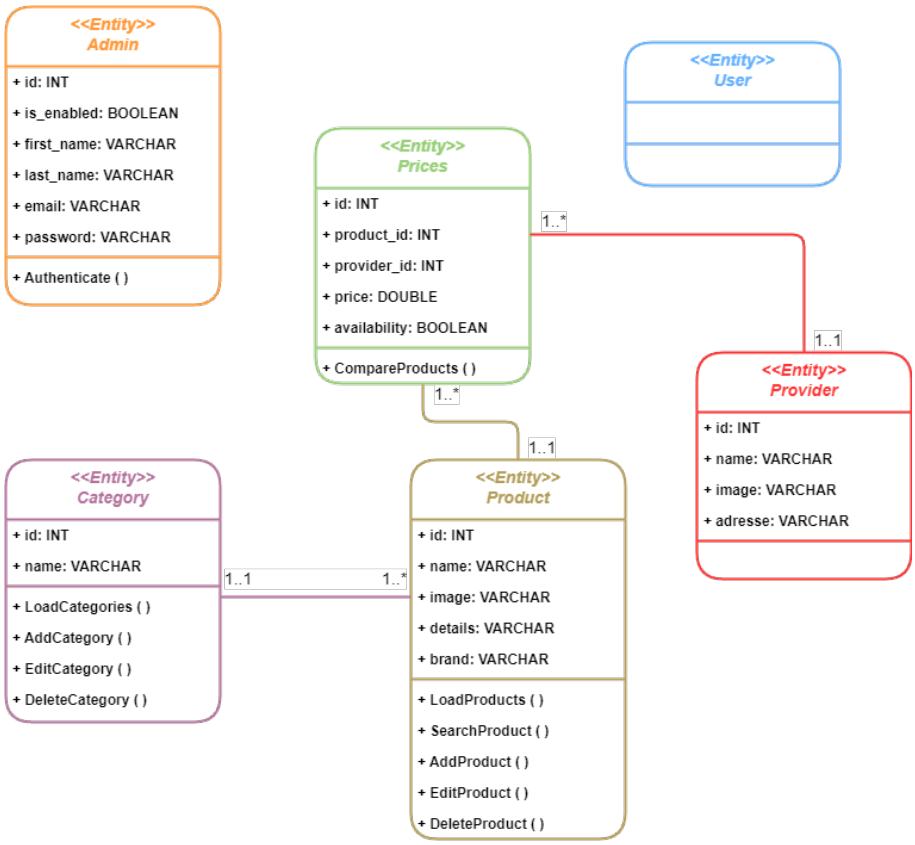

Figure II.2: Class Diagram

senting use case and class diagrams, we have laid a strong foundation for the development of our web application. The comprehensive understanding of the project's context will guide us through the implementation process, ensuring a successful and user-centric application.

Chapter III

Production

A Introduction

In this chapter, we will delve into the technical choices made for the development of Comparini, a price comparison web application. We will discuss the technologies employed on both the client-side and server-side, including PHP8 and how we utilized classes for efficient code organization. Additionally, we will provide a demonstration of the main pages and functionalities of the application.

B Technical Choices

1 Web Application

1.a What is a Web Application?

A web application is a software program accessible through a web browser. It allows users to interact with dynamic content, perform tasks, and access information over the internet. Web applications rely on a combination of server-side scripts (e.g., PHP) and client-side scripts (e.g., JavaScript) to deliver a seamless user experience.

C Working Environment

To develop Comparini, we used Sublime Text 3 as our code editor. Sublime Text 3 offers a clean and fast interface, along with various built-in features like multi-edit and vim mode. Additionally, it supports plugins and snippets, enhancing our coding efficiency. We also utilized phpMyAdmin, a free tool for managing MySQL databases, enabling us to handle database-related operations with ease.

D Used Technologies

1 Client Side

To create an interactive and user-friendly interface, we utilized the following client-side technologies:

1.a HTML 5

HTML5 is a markup language that defines the structure and behavior of web page content. It is the current major version of HTML and forms the foundation of web development.

1.b CSS 3

CSS3 is a style sheet language used to describe the presentation of a document written in a markup language like HTML. It enables us to style the elements of our web application.

1.c JavaScript

JavaScript is a dynamic programming language that allows us to add interactivity to our web application. It provides a wide range of functionalities and enables asynchronous communication with servers.

1.d jQuery

jQuery is a JavaScript library that simplifies DOM manipulation, event handling, and animation. It streamlines the development process and supports AJAX calls.

1.e Ajax

Ajax is a set of web development techniques that enable asynchronous communication between the client and server. It facilitates seamless data exchange without disrupting the user experience.

1.f UIKit

UIKit is a lightweight front-end framework that offers modular jQuery JavaScript components. It provides structure-only styling, making it easy to customize the application's appearance.

1.g Notiflix

Notiflix is a pure JavaScript library for displaying non-blocking notifications, popup boxes, and loading indicators. It enhances the user experience by providing real-time feedback.

2 Server Side

For server-side development and data management, we employed the following technology:

2.a PHP8

PHP8 is a general-purpose programming language designed for web development. We utilized PHP8 to handle server-side logic, process form data, and interact with the database.

3 Database

3.a MySQL

MySQL is a domain-specific language used for managing data in a relational database management system. We utilized MySQL to store and retrieve data for the application.

These technologies enabled us to build Comparini, a dynamic and efficient price comparison web application. We chose PHP8 for its speed and versatility, and organized our code using classes for improved maintainability and scalability.

E Demonstration

In the final part of this report, we provided a demonstration of key functionalities within the Comparini application. Through various screenshots, we showcased the main pages and interfaces, highlighting the user-friendly design and seamless interaction.

F Conclusion

In conclusion, Comparini is a web application that leverages cutting-edge technologies to facilitate price comparison across various markets. We made technical choices to ensure a responsive and user-friendly experience, incorporating PHP8 and classes to achieve efficient code organization. The demonstration of the application illustrated its key features and capabilities. Overall, this project has allowed us to delve deeper into web development and hone our skills for future challenges in the field.

Conclusion

In conclusion, creating the Comparini web application was a significant undertaking that aimed to solve the problem of people having to visit multiple markets to find the best prices. Throughout the development process, we encountered several challenges and came up with creative solutions to overcome them.

One of the main challenges was implementing real-time price comparison by scraping data from various markets. This required careful data extraction techniques to ensure accurate and reliable product information for users.

Providing support for multiple languages and customizable themes added complexity, but it was essential to cater to a diverse user base and allow personalization.

Security and user privacy were top priorities, and we took great care in implementing a secure login system and managing data safely.

To address these complexities, we focused on leveraging web services and the AJAX framework, enabling us to efficiently send and process data, as well as retrieve results dynamically.

Despite these challenges, our collaborative efforts resulted in the successful creation of Comparini, a user-friendly platform that helps users make informed decisions while shopping.

Undertaking this end-of-year project has been an incredibly enriching experience, as it provided us with an in-depth exploration of the web development sector. Collaboratively developing the web application "Comparini" allowed us to actively engage with its technical aspects.

We take immense pride in contributing to and sharing our technical expertise with the esteemed Sesame Jury Members. The entire journey of this project, from its inception to completion, exposed us to various stages of web application development and honed our skills in collaboration and effective communication to achieve our objectives.

Going forward, we will continue to improve the user experience and update web scraping techniques to keep product information accurate and up-to-date.