Development of an online store platform using object-oriented programming

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***Abstract*—**

I. INTRODUCTION

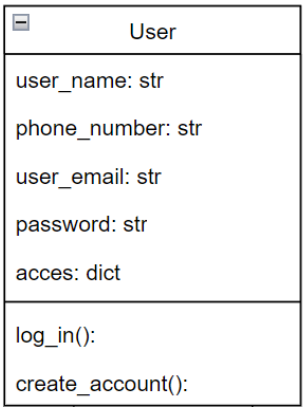
Object-oriented programming is defined as a programming paradigm that attempts to simulate things in the real world through elements called objects. These objects have some characteristics such as inheritance, polymorphism, encapsulation, and abstraction. Likewise, these objects are defined as a series of behaviors called methods and properties known as attributes. [1]. This project aims to develop an online store platform using the object-oriented programming paradigm. According to the author [2], electronic commerce refers to any commercial transaction in which the transfer of information through electronic networks is used to purchase and sell goods or services. Starting from these concepts, it is important to highlight that this research aims to understand how object-oriented programming can be used to develop software for an online store. So, in this document, the first chapter will discuss the methods and materials necessary to develop object-oriented software. In the next chapter, the experiments to be carried out to meet the objective of developing an online sales platform will be discussed and the results of this experimental practice will also be discussed. In a final chapter, the conclusions about the functionality of object-oriented programming in the creation of a functional online sales platform will be developed, which allows managing the purchase of products in an agile and effective way.

II. METHODS AND MATERIALS

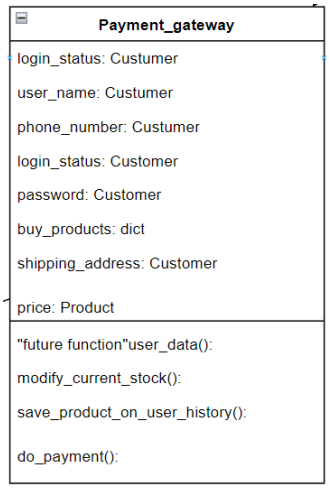
A. Methods

This project aims to develop a functional online store platform. For this purpose, the following technical decisions will be made. First, Python version 3.12.1 will be used for the development of the logical part of the software, and the FastApi framework will also be used for communication between the different layers of the platform. For the data layer, we will use an ORM tool, in this way the SQLalchemy library is selected which will facilitate the connection of the database from the backend of the platform and thus be able to manage the database with a syntax similar to that of the python programming language. The softwares Html, CSS, and Javascript will be used for the development of the frontend, in the same way, the Apache server software will be used to deploy the application as localhost and the Django framework will be used to obtain a better graphical interface. Regarding the development process, we decided to use the GitHub hosting software to facilitate the cooperative development of the online sales platform and the management of its versions.

Class diagram decisions: Firstly, it was decided to use a User class, because it contains the necessary attributes to identify the user, define their type of access (buyer or administrator) and the methods to create the account and log in.

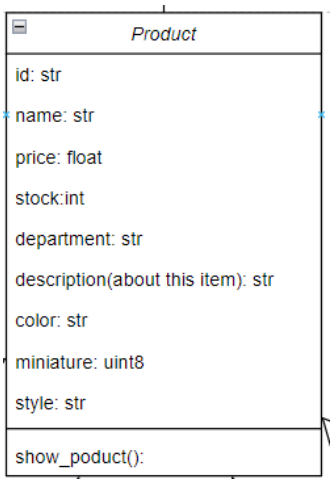


On the other hand, a type of Payment Gateway was created, with this we want to relate the purchase of a product with a customer and with a product, as well as have the possibility of modifying the stock and taking the product to the user's history.

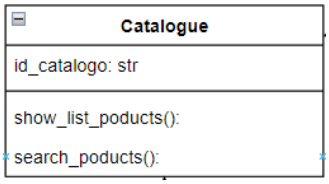


We decided to create a product class that has all the

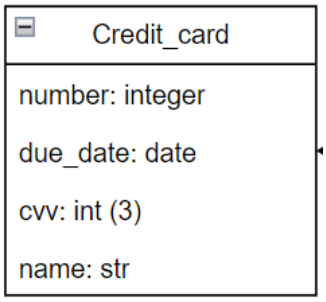
attributes that identify it, and also has a method to display the product. This class also serves as a template to generate each of the product categories (Electronics, home-kitchen, sport, fashion).



The catalogue class was developed as a way to display several products in the same interface, and at the same time have the possibility of searching for a specific product.



The credit card class was created with a number attribute, a functionality deadline, a cvv number to use the card securely, and a card name. In this way, with this class you want to have a specific payment method to use in the online store.



B. Materials

In the project, some hardware elements will be used for the development of the online sales platform, among them 8 GB ram will be used since we consider it necessary for efficient performance of the software. A 10th-generation Intel core i5 processor will also be used because this processor can execute the processes to meet the demand of the platform.

Finally, a 500 GB hard drive will be used, because we consider that this can store the software information and other software necessary for development, without generating problems with the space reserved for the operating system.

III. EXPERIMENTS AND RESULTS

To check the correct operation of the system, the following procedure will be carried out. First, the corresponding unit tests will be carried out on the backend, such as verifying the integrity of the data in the creation of the user, products, shipping address, payment methods, etc. The correct operation of each method will be tested, such as: $createAccount()$ and $login()$ belonging to the user class, $modifyCurrentStock()$ belonging to the $PaymentGateway$ class, $productPost()$ and $showProduct()$ belonging to the catalog class, between others that can be watched in the class diagram . To test the persistence of the data we will use the Faker library to generate the data corresponding to user accounts, products, credit cards, and addresses, which will be stored in a fictitious database, on which we will verify the persistence by making multiple purchases with different accounts, In this process, the attributes of the user account will be verified when logging in and the correct creation and modification of a product will be verified by observing the product and purchasing.

IV. CONCLUSIONS

REFERENCES

[1] S. Valbuena and S. A. Cardona, “Object-oriented programming principles” Elizcom S.A.S, 2018, pp. 7.
[2] C. A. Robleto, “Electronic Commerce: Background, Definitions and Subjects”, 2004, pp. 6-8.