Project definition: Distribution and market application for apps and digital products

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Abstract--**In the current digital landscape, the necessity for a centralized platform facilitating the discovery, acquisition, and management of digital applications and products is evident. This paper provides a comprehensive exploration of such a platform's development, particularly emphasizing the creation of a robust database system. It highlights the exponential growth of the digital market and the pivotal role of a centralized distribution platform in delivering diverse and high-quality digital content to users. The paper discusses key functionalities, such as content search, filtering, secure purchasing options, and customer service interaction, all approached with a user-centric perspective. It outlines meticulous database design processes, including entity-relationship modeling and normalization principles, while considering factors like scalability and performance in the selection of Database Management Systems (DBMS). Testing and optimization strategies, including performance testing and monitoring, are also discussed to ensure the database's efficiency and reliability. The paper concludes with proposed experiments validating the database's scalability and query optimization, offering insights crucial for similar projects in the dynamic digital landscape.**

I. INTRODUCTION

In the current digital era, the market for digital applications and products has experienced exponential growth, providing users with a wide range of options to meet their needs and preferences. In this context, the creation of a platform that serves as a hub for downloading and distributing digital applications and products becomes crucial to facilitate access and exploration of diverse and high-quality digital content.

This paper focuses on presenting a project that addresses these needs by developing an application that serves as a central point for discovering, acquiring, and managing digital applications and products. This application offers a comprehensive experience for users, from exploring and discovering new content to managing and updating their digital library.

Within this context, crucial aspects such as content search and filtering, digital library management, secure purchasing options, customer service interaction, and user data security will be addressed. Additionally, the role of administrators in content moderation, data analysis, and ensuring platform security and privacy will be discussed.

In summary, this paper provides a comprehensive overview of the project of an application that acts as a center for downloading and distributing digital applications and products, highlighting its importance in the current digital landscape and providing a framework for successful development and implementation.

II. METHODS AND MATERIALS

The development of the application as a hub for downloading and distributing digital applications and products requires careful planning and selection of appropriate tools and technologies. Below are the proposed methods and materials, with an emphasis on building the database, a fundamental component for efficient operation and effective management of the platform.

Database Design:
- Entity-Relationship Modeling (ER): Entity-relationship modeling techniques will be used to design the database structure, following a planning based on the ontology of a relational database. This allows us to identify key entities based on the requirements proposed in the user stories such as Users, Applications, Reviews, Payment methods, Devices, Categories, among others.

Developing this model following the ontology method also allows for the identification of relationships between different entities, providing greater security when building the database from its planning stage. Similarly, defining attributes in each entity leads to a more concrete vision of the data that will be managed by the database and that will be present both in the application development and in the final version that will reach the user.

- Data Normalization: In conjunction with the ER model, normalization principles are applied to eliminate redundancies and ensure data integrity, avoiding anomalies such as redundancy and dependency, thus creating a more malleable and flexible system in case changes are needed in the future.
- Selection of Database Management System (DBMS): DBMS options like MySQL, PostgreSQL, or MongoDB will be considered, selecting the most suitable one according to the application's requirements in terms of scalability, performance, and data handling capacity based on tests to be performed for the application to operate.

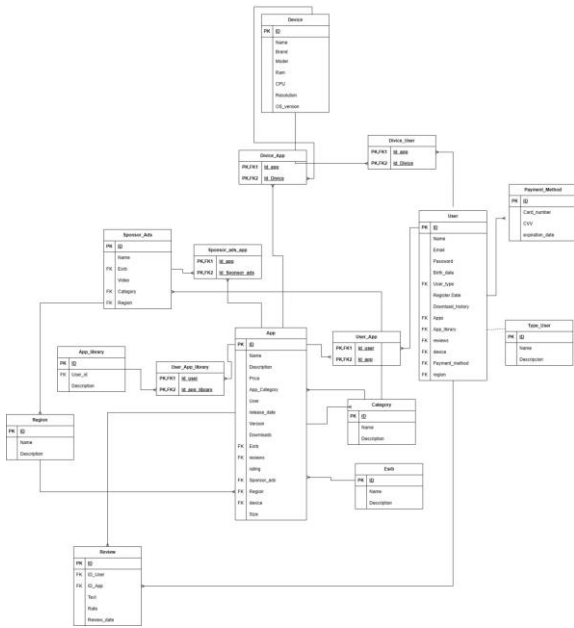* Universidad Distrital Francisco José de Caldas

MODEL PRUPOSED:

Fig. 1. Entity-Relationship Model diagram

Testing and Optimization:
- Performance Testing: Load and performance tests will be conducted to evaluate the database's capacity under intensive usage conditions and optimize its configuration as necessary.
- Monitoring and Adjustment: Once the database is deployed, the respective adjustments will be made according to the behavior in relation to the requirements stipulated in the user stories by the client. Thanks to the flexible and dynamic system established, it is possible to change its structure without affecting most of the project.

Together, these methods and materials provide a solid framework for developing the application's database, ensuring its performance, reliability, and security to effectively support the functionalities of the digital application and product downloading and distribution hub.

III. EXPERIMENTS FOR DATABASE CREATIONS

To ensure the efficiency, scalability, and reliability of the project's database, it is essential to conduct a series of experiments to evaluate and validate its operation under different conditions and workloads. Below are the possible experiments that could be conducted:

Query Optimization Experiment:
The aim of this experiment is to optimize the most frequent queries by structuring simpler and more specific requests. To achieve this, the execution plans of the proposed queries for building the database and the application's backend outlined in the functional requirements of the user stories will be analyzed. Adjustments to the queries will be made through relational algebra to make them more efficient and provide more accurate results as required.

The expected result of this experiment is the reduction of query response time in the databases and at the same time more precise results as required.

Scalability Experiment:
The aim of this experiment is to determine if the proposed model is well-designed so that it can be changed according to the request of a new requirement for the application in the future. To do this, the database will be taken once built according to the proposed model and a new functional requirement will be added so that it is necessary to change the model by adding or removing entities and the relationships between them.

The expected result of this experiment is to see how scalable the proposed model is by observing whether modifying the relationships between entities affects a large part of the system or if, on the contrary, it is completely feasible to make changes of this type without having to spend a greater amount of resources rethinking the model for its adjustment according to the requirement.

In summary, these experiments will provide a comprehensive evaluation of the project's database, ensuring its robustness, performance, and security to effectively support the functionalities of the digital application and product downloading and distribution hub.

REFERENCES

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