BD II Project Documentation

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***Abstract*—This document works as a documentation for the project of the Data Bases second course of the Computer Engeneering carreer of the Instituto Tecnologico de Costa Rica, the main goal is to achieve a Whiskey company's database following clean code practices and using different databases engines. Its important to maintain the order and the clean work in diagrams, codes and the present document to reach a clean final project.**

***Index Terms*—Whiskey, database, sql, web**

I. Introduction

The whiskey is not a simple drink, there is a culture about it, the Whiskey was born in Ireland and its production spreads rapidly in Scotland. It is a distillate of cereal aged in wooden barrels. The pioneers in distilling it and formalizing the elaboration process were monks, from them it passed to the peasants who installed countless homemade stills.

Even, there are many people who dedicate their lives to whiskey professionally around the world, they know how to find the difference between a good and a bad kind of whiskey.

For the present project, this drink will be taken as the central axis, since the problem presented is that of a meeting of friends where they have agreed to create a web page for all fans of whiskey from Ireland, Scotland and the United States. The complete context will be described in the "Context of the topic" and "Who is it for and why?" sections.

The web page will have different databases to manage all the respective data like employees, inventory, users, products, etc. The full explication of the project architecture will be described in the "Application Architecture" section and all the databases diagrams will be shown in the "Database Design" section.

The present document will be the documentation for the prevoiusly mentioned project.

Those in charge of this project will be three students of the Computer Engineering career at the Instituto Tecnologico de Costa Rica, each of the students will use technologies such as database engines, cloud environments for databases, a language of specific programming and others, these technologies will be described in the "Used Tools" section.

All the results will be analyzed in the "Results Analysis", "Found Problems" and "What was achieved and what was not?" section where will be described all the important facts of the finished problem.

All the final conclusions of the project will be shown in the "Conclusion" section.

This document will be made and based on the LaTeX tool and environment to achieve a clean and professional view as well as a correct bibliography.

All the project will be saved in a GitHub repository, the link https://github.com/Kdani06/BDProjectRaDaVa.git is the GitHub repository link previusly mentioned.

II. Definition of important concepts

A. Databases

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a database management system (DBMS). [1]

B. Frontend

FrontEnd is responsible for styling the page in such a way that it can present the information in a pleasant way for the user. The person in charge of the FrontEnd must know the user experience techniques to provide a better interaction between the person and the page they visit, and must also have knowledge of Interaction design to place the elements in such a way that the user can locate them. quickly and comfortably. [2]

C. Backend

BackEnd is the data access layer of a software that is not accessible to the end user. Also, this layer contains all the application logic that handles the data. It should be noted that the data of an application is stored in a database within a server. [2]

D. Framework

A framework adds extended functionality to a programming language, automates many of the programming patterns to orient them to a certain purpose, providing a structure to the code, improving it and making it more understandable and sustainable, and allows the application to be separated into layers. [3]

III. Context of the topic

Some friends have met in an afternoon and they want to implement a website for all Whiskey fans for the countries of Scotland, the United States and Ireland. They want a 24/7 system, in which the server is always available and any customer can make a purchase or a subscription to the page at any time. They have hired the three members of this project as the company in charge of developing said program.

After numerous meetings to gather requirements, the clients concluded that they want the following functionalities and general restrictions:

- English is the common language of the three countries for which the application will work, so everything must be in this language without exception.
- The application must be web without exception. The databases must be hosted in the cloud.
- Follow "Clean code" practices
- The use of a Git repository is completely mandatory
- All data entry must be validated at the database level.
- Passwords must be encrypted by a database-level preference algorithm.
- The project must carry out internal documentation (comments in the code)
- Docker can be used.
- Databases must be heterogeneous, distributed and have vertical and horizontal fragmentation.
- The system logic must be created at the database level.
- For each database, the necessary users must be generated.

IV. Who is it for and why?

This project is aimed at people who love whiskey. The target countries are the United States, Scotland and Ireland, therefore, knowing that the English language is the common language, this language will be the target language. The target age ranges from 21 years (Legal age) onwards, since whiskey is an alcoholic beverage, therefore its delivery to minors is prohibited.

V. Methods

A. Proposal Description

The main proposal for this project is a web application designed in html, which will show the data stored in different databases, the use of the databases will be given because the large amount of data that will be used in the project will be accessed more orderly and efficiently. In addition, the technologies of SQL Server and PostgreSQL will be used because the communication between both technologies is simple and both technologies offer useful tools for managing the data that is needed for the project, such as geographic data, handling of JSON files and communication with different programming languages. Additionally, another detail is the use of a GIT repository for the versioning of the project, since this way it will be possible to work in a more orderly and complete way, in addition to the fact that all those in charge of the development will be able to have better communication and order between them and to put the parts together. of code or designs will be done in a better way. The proposed programming language is Python as it is one of the most powerful languages on the market and its framework called Flask is easy to use and it is not a framework that takes many resources from a terminal.

B. Used Tools

The used tools for all the project are the next ones

1) Databases Engines:

- SQL Server
- PostgreSQL

2) Versions Control:

- GitHub
- GitKraken

3) Frontend:

- Python
- Flask
- JavaScript
- Css
- Html

4) Documentation:

- LaTeX

C. Application architecture

The architecture of the project will be as follows, first the frontend which contains a web page developed with HTML code together with the CSS styling language and the JavaScript programming language. Then in the Backend the web page will be connected to the Flask framework, which will be responsible for communicating the page with the Python programming language, the code in this language will be responsible for sending the data returned from the databases that will be designed with SQL Server and PostgreSQL technologies which will communicate with each other. It is important to know that all the logic of the system will be on the database side, that is, it will be designed in SQL language.

D. Database design

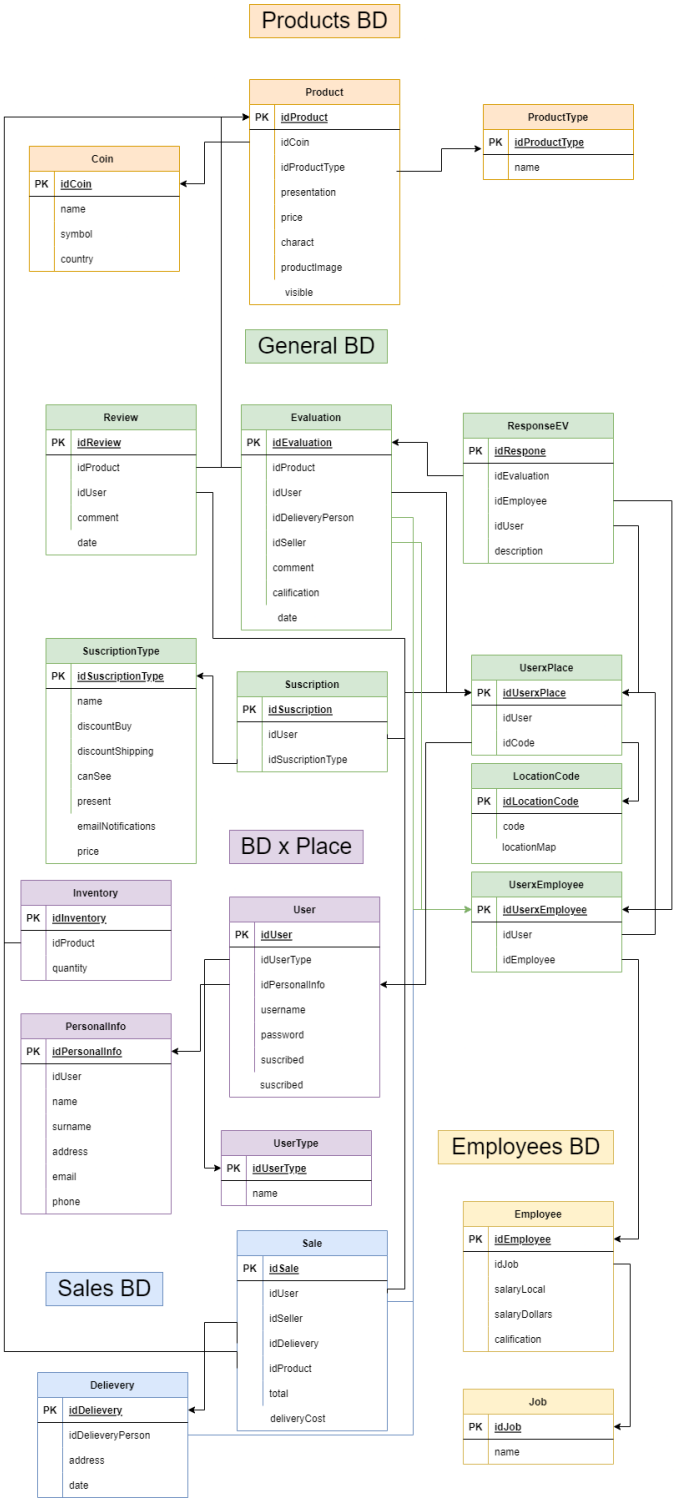

Fig. 1. Database Model

VI. Results Analysis

A. Founded Problems

1) Cloud Data Bases: To use the databases in the cloud, you must have a paid subscription to a service such as AWS or Microsoft Azure, if you do not have the paid subscription, it gives many limitations, so it could not be used correctly.

B. What was achieved and what was not?

1) Achived:

- Distributed DataBases
- Fragmented DataBases
- Web Aplication
- Clean Code
- Communication between different technologies
- System logic in a DataBase level

2) Was not Achived:

- Cloud DataBases

VII. Conclusion

Once the analysis of the results of this project has been carried out, it can be concluded that databases are an important part of any programming idea, whether it is a web application or a program that works locally, since it is the most effective at handling large amounts of data. At the beginning of the project, a context was proposed for a group of friends who wanted a web application for all Whiskey lovers in three different countries, so the number of people who could use the system had to be taken into account, so Both the use of databases and choosing the technologies to be used were even more important than the development of the project itself. It is also important to keep in mind that the use of ”clean code” helps a lot in a project that is carried out in groups, since it is easier to make changes and fix problems that appear. Finally, it is essential to know that any application that handles large amounts of data must be connected to different types of databases, so you must never stop learning or being in touch with the technologies available for the realization and implementation of the Databases in general.

References

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