Documentation Challenge MIT Innovación inteligente de comercio para pequeños negocios

HACKMX 2024

Team members

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Introduction

During the HackMX 2024, a hackathon with the goal centred in innovation through technology, the MIT Lift LAB created the challenge of developing an AI based solution with the objective of sales and inventory optimization for small stores, usually managed by an elderly person and their family, commonly known in Mexico as “Tienda de barrio”.

This challenge focused on developing a useful tool that lets the owner of the store manage more effectively, reduce time, have a better record of their sales and with the help of Artificial intelligence make better decisions based on accurate data.

These types of businesses face multiple challenges to keep up with the market, because usually their management depends on manual processes which can end up on mistakes, inventory losses or decisions without the whole panorama in mind. A solution for this is Artificial Intelligence because of its potential in transforming these processes, offering an intuitive monitoring and managing system, notifying the owner of those products that need to be restocked and giving a clear vision of the sales flux.

Implementing this type of technology is not an easy task, but there are many benefits we can get by using it and in this case, small shop owners can focus on giving a better customer service and develop strategies for their growth, benefiting from this tool that ensures precision and optimization for their business management.

Product / Prototype

Solution 1:

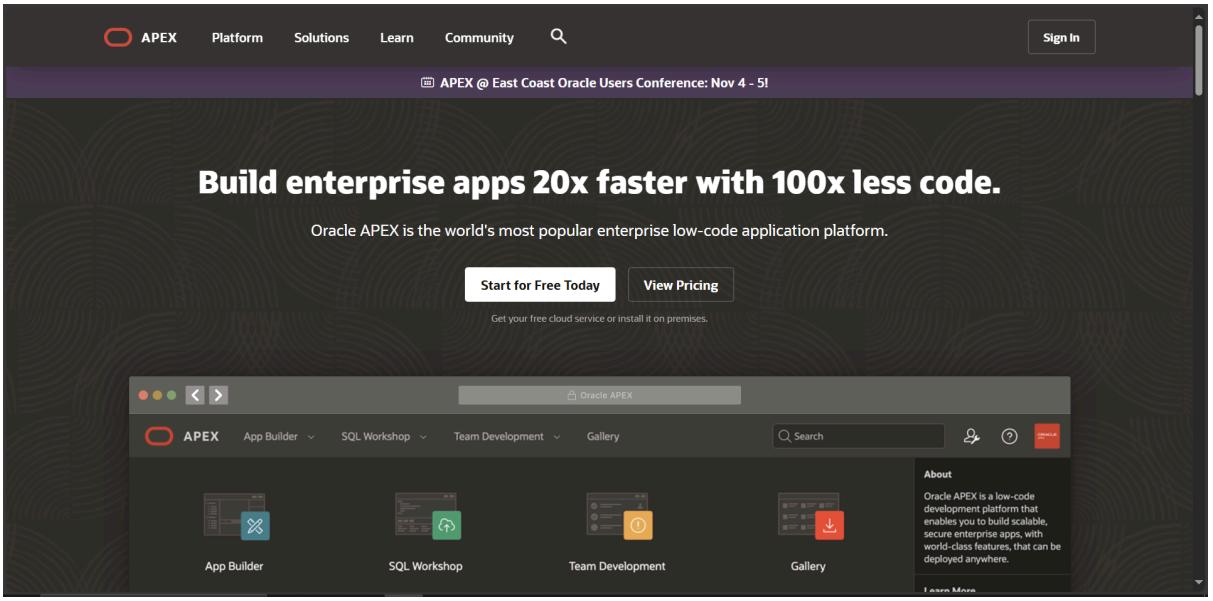
Our team decided to focus on the intelligent monitoring of the inventory, developing a PWA using Oracle APEX. This system helps these businesses to register their inventory, sales, changes in its inventory by using an ID in the barcode of any product. The system lets the

small shop owners check any list of products that is registered in the inventory, its price and stock, getting a better management of their products.

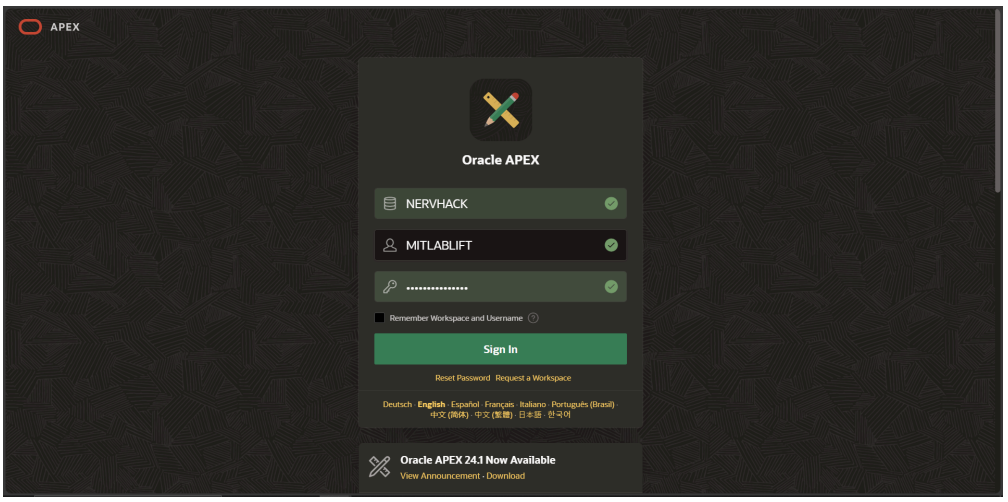
Link for the final user page: Sign In | GESTION-TOTAL (oracle.com)

Implementation:

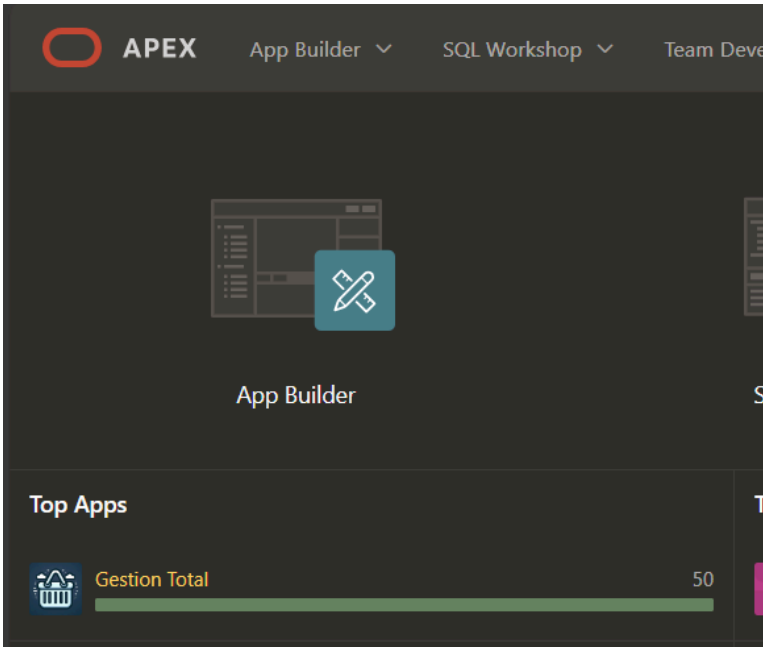
1. Ingressing to Oracle APEX
2. Logging in



3. Ingressing to the workspace: NERVHACK
4. Email starting with: a01801490@tec.mx
5. Email password: hackmx1234



6. Oracle user: MITLABLIFT
7. Oracle password: Nervehack2024
8. Click in Gestion Total
9. Click in the play button that is located at the top of the screen on the right side



Note: In order to facilitate access to the user interface of our app, you can refer to the following link: https://apex.oracle.com/pls/apex/r/nervhack/gestion-total/inicio

Solution 2:

The second solution (speech to sql) is presented as a prototype almost completely functional, due to an external problem related to the ports in which the text is loaded through the interface developed in Kotlin to the backend developed in python, the impediment to get the text to the python server in which the implementation of Artificial Intelligence that using

the text that is supposed to get, it should consult what is necessary, things such as sale, restock and find specific products.

Implementation

1. Open the file server.py
2. Run the project, and because it is a server, it should remain open
3. Open the project Nervhack2 in Android Studio
4. In case of running the project in a real phone, the computer virtualization should be active
5. Apart from this, the option for developers should be active and through this, depure from USB, connecting the phone to the computer with a cable
6. Run the project (it will run in the phone)
7. Give the instruction with the command words “vendí …”, “compré …”, etc.

Interview

We interviewed two small shop owners to recollect their feedback about our project viability and tested the prototype to know if it was going through the right direction, here is the video with the results: https://youtu.be/NbTaUWVdeIs

Areas of improvement

Through the process of developing a solution of the HackMX, we identified various important areas of improvement regarding the technology, specifically those critical aspects for implementing management systems for the small shops. We are sure if we had more time, we could have developed a better app, talking about efficiency and easy use. We will talk more about these areas.

One of the main areas of improvement is the implementation of computer vision in real time with the objective of automating as much as we can the management of their inventory, depending on the necessities the client expresses, what could be used is a local system or internet connection.

During the development, importing and exporting data between the app developed in Kotlin and Oracle APEX was a challenge that showed us this area of improvement for data interoperability. The difference of data managing and synchronisation between both platforms requires an advanced integration structure.

Similarly, improvements can be made in various aspects of the application, both in the interface and in the robustness of the system. Regarding solution 2, the biggest area for improvement is fixing the bug that kept us busy for half the time of the hackathon—an

unusual behaviour of the communication ports. Once resolved, this issue will ensure that the speech-to-SQL functionality operates correctly.

Conclusion

During the presentation of the challenges to be addressed, the one we resonated with the most and could understand the issue was the one from MIT, as most of our team members had family members who at some point were part of the large population that owned a small store. During this challenge, we not only developed a prototype with an idea in mind but also ensured that we gathered feedback from those for whom the solution is intended to