

Mercado Libre XS DB Design

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Abstract—This article presents the design and development process of a database for the e-commerce platform "Mercado Libre". The application facilitates the purchase and sale of products, from technology to vehicles and properties, both new and used. The main objective is to support e-commerce for small and medium-sized businesses, improving their visibility and expansion.

Index Terms—component, entity, attribute, MER, functionalities

I. INTRODUCTION

E-commerce has transformed the way people buy and sell products, in that way the databases of these applications must be robust to support such amounts of data. This article describes the phases of the database design of Mercado Libre-XS, starting with the collection of user stories, the identification of functionalities, and the construction of an entity-relationship model.

II. BUSINESS MODEL

"Mercado Libre" is an e-commerce platform that facilitates interaction between sellers and buyers. The application allows sellers to offer new or used products and buyers to find items according to their preferences. The business model focuses on providing an easy and accessible shopping experience for any user, with the additional goal of improving the visibility of small and medium-sized businesses through customized online stores.

III. METHODOLOGY

The methodology used for the design of the database begins with the previous information necessary for the database design, and from that information the entity relationship model (MER) is built using the 10-step procedure explained by Professor Carlos Sierra:

IV. PROCESSES AND INFORMATION REQUIRED

In order to build the application we require more information apart from the business model, such as user stories and from there we can extract functionalities to turn them into entities and finally make the entity relationship model.

The first phase to be able to design the database is to know the necessities of the user. For this, first an interview was conducted with people asking what they would like to see in a Commerce applications, where they mentioned their point of view based on personal experiences with similar applications.

These interviews were transformed into user stories where all the interviews are summarized, these user stories are in the format.

As a (role), I want (action), so what (impact)

The interviews with people using similar commerce apps revealed the following needs:

- Create an account to start buying or selling products.
- Filter products by criteria such as price, category, and location.
- List products with detailed descriptions, images, and prices.
- Manage a shopping cart and checkout securely.

These stories were transformed into key features of the app, such as advanced product search, the creation of personalized online stores, and the ability to offer discounts and promotions.

V. DESIGN OF THE DATABASE

A. Define Components

The components are the application modules; in this case they are:

- Transactions
- Client Service
- Products to Buy
- Delivery Service
- Sale of products

B. Define Entities

With the components defined, we can identify main entities found from the components, however the amount of entities is over 20, so the main entities are:

- User: Includes attributes such as first name, last name, address, email, and account status.
- Product: Includes details such as name, description, price, category, and product status.
- Transaction: Captures purchase details such as payment method, transaction status, and amount.

C. Relations between entities

Key relationships between entities were defined to ensure data integrity. For example, a user may have multiple transactions, and a product may be part of multiple transactions and shopping carts.

Nevertheless, as the amount of the entities are too big to be documented in the article, they will be ignored.

D. First MER Diagram

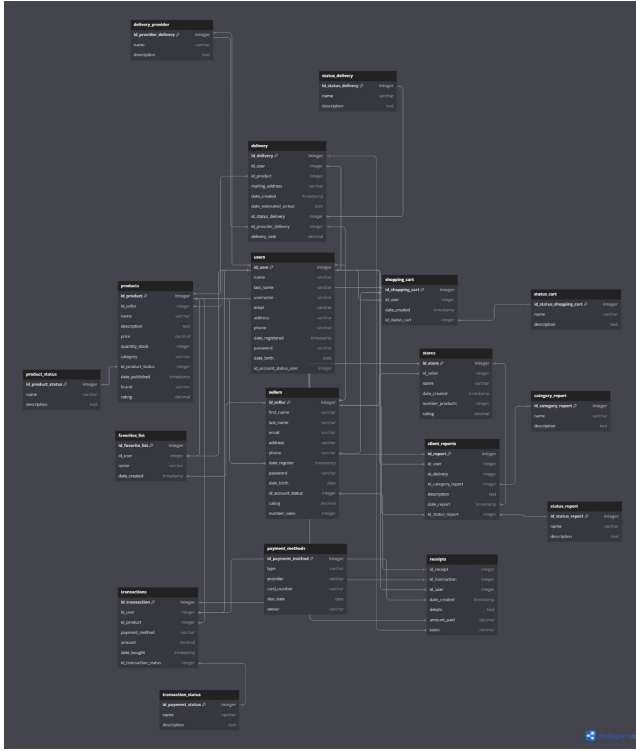


Fig. 1. First design MER

This diagram is the result of the first 5 steps applied, however will be more entites to add later.

E. Many-Many Consideration, Structure Data, Properties and Constrains

If you see the image showed above, you will see some Many-Many relationships, which are bad having in the MER, then the procedure to solve this is create middle entities to make 2 One-Many Entities like the relation between Seller and User.

Also defining the Structure data, properties and constrains are important to the integrity of the database. Some Data like email in user must be filled and have a limit of characters.

VI. FINAL RESULT

VII. CONSIDERATIONS

This design is basic compared to a fully E-commerce applications such as Mercado Libre or Amazon, so there is no total functionality, however this design would be considered as a base model for an E-commerce application.

A. Conclusions

The database design for Mercado Libre was an iterative process that involved understanding user needs, defining key entities, and creating robust relationships between those entities.

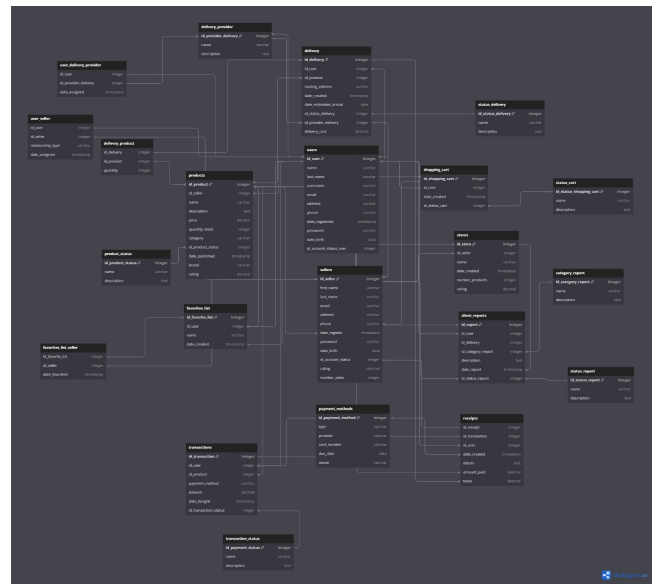


Fig. 2. Final Design of the MER