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Design of a E- Commerce Database System

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Requirements

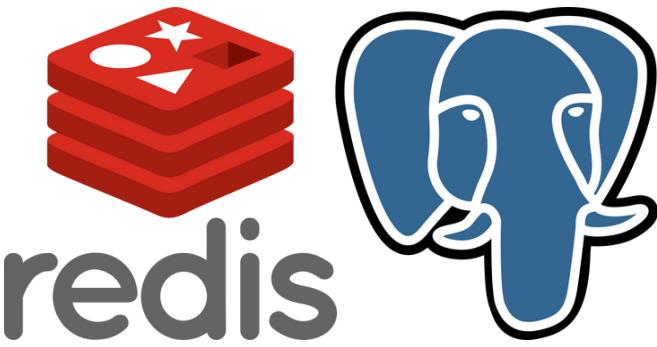
The definition of requirements was guided by user-centered design principles.

Functional

31 Requirements

Non-Functional

12 requirements

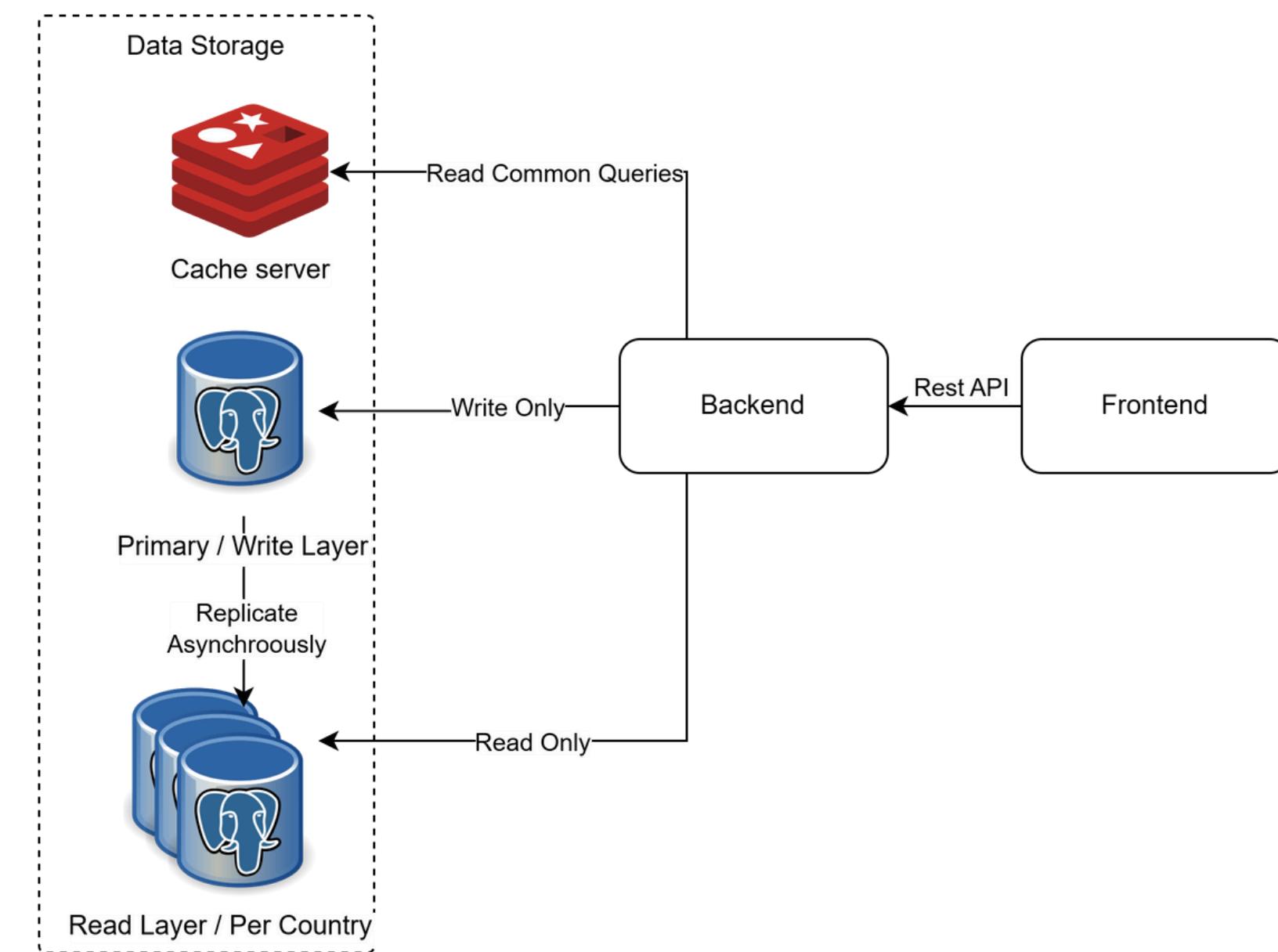


DataBase Architecture

The proposed architecture considers the integration of distributed components to ensure modularity, efficiency, and high availability.

Write Layer	Read Layer	Replication	Data Partitioning	Cache Layer
Responsible for data creation and modification operations.	Optimized for query operation	It is intended to support scalability through replicated instances	Is designed to support data partitioning based on geographic criteria	Optimizing response times by storing frequently accessed information

DataBase Architecture



ER Model

Its design follows a sequential and structured approach, ensuring clarity, consistency, and alignment with the requirements

Components

The system is divided into 10 main components

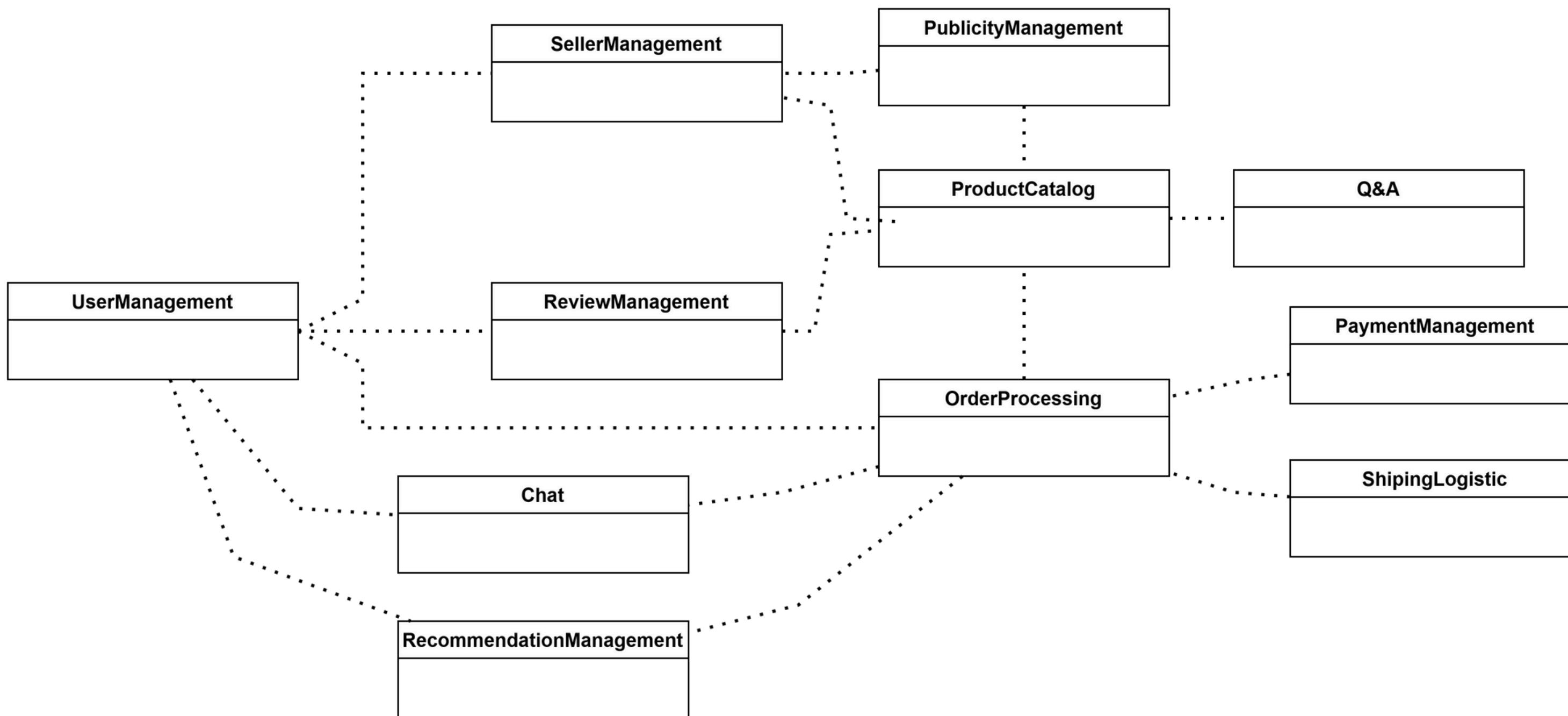
Entities

A total of 25 entities were identified and distributed among the components.

Relations

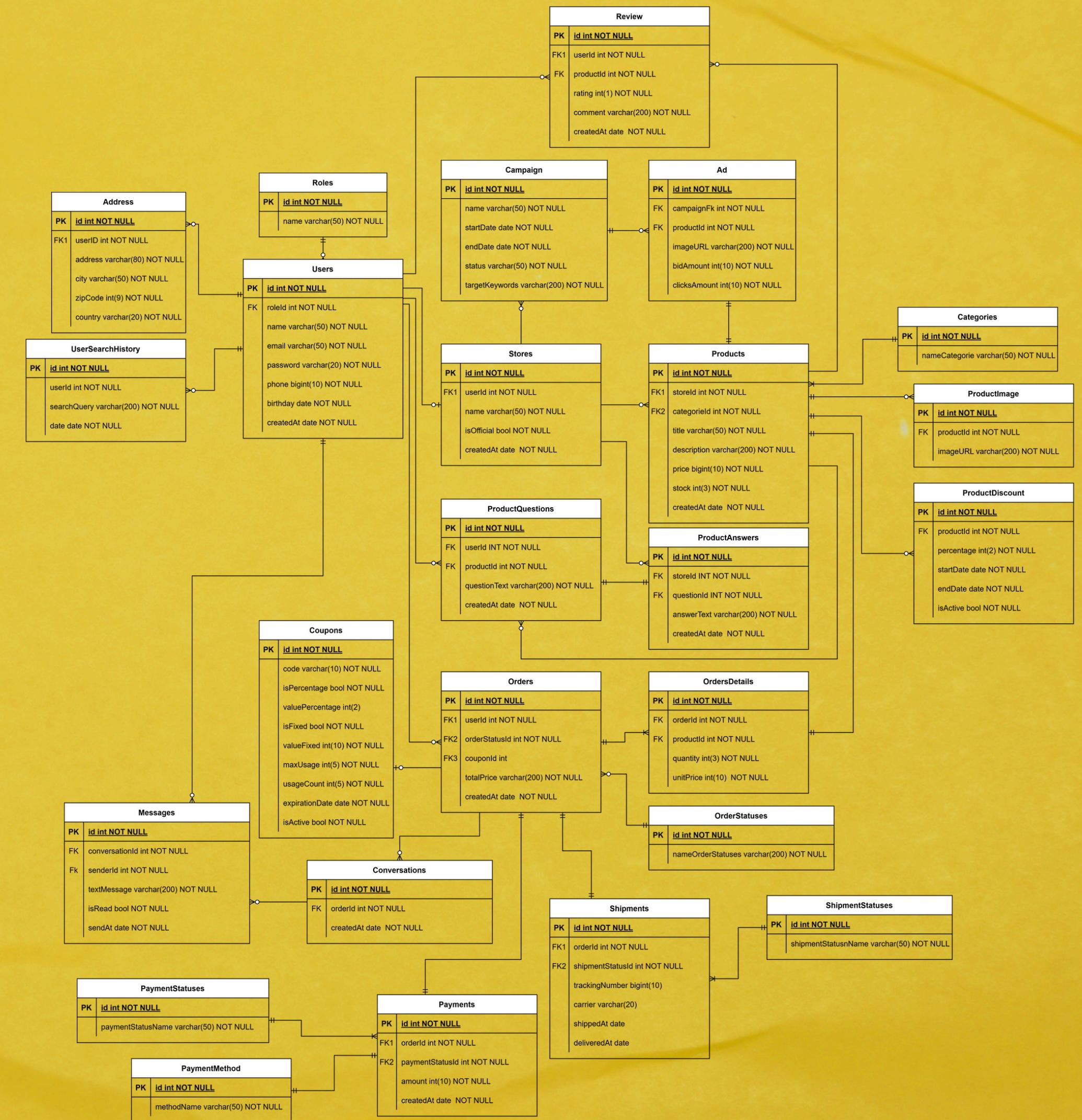
The entities are linked through defined relationships that reflect business processes, a total of 29 relations.

ER Model - Components



ER MODEL

The first ER model consolidates the structure and logic of the system in a coherent and normalized schema.



ER Model

While this model assumes a centralized relational structure, it naturally supports evolution toward a distributed system.

Cache and Replication

Read-heavy entities like Products or UserSearchHistory can be replicated or cached.

Partitioning

Partitioning strategies can be applied to Orders and Users to distribute data across regions.

Moving data to another storage

Entities such as Messages or Campaigns can be detached into separate services or document stores.

Thanks!

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