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**INFO 6210 DESIGN DOCUMENT – Team 14**

**TOPIC: ECOMMERCE DATABASE DESIGN**

**Team Members**

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**Database Purpose:**

The purpose of the database is to maintain the data used to run an ecommerce brand. This will include inventory management, buyer and seller details, shipment details, and payment information.

**Business Problems Addressed:**

* Allows the sellers and the E-Commerce company to analyze the products and customer purchase behavior
* Provides vital information that helps in allocation of resources across the warehouses to reduce the cost of logistics
* Provide insights on the product performance based on the ratings and reviews provided by the customer
* Analyze customer purchase pattern to customize offers specific to customer
* Track the spending nature like credit/Debit/Gift cards etc
* Increase the transparency across the supply chain to track the order based on the status

**Business Rules:**

* There are 4 primary tables – Customers, Product, Order and, Order Details. Along with them there are other ancillary tables to support the design
* In the Payments table, the card details must be encrypted using an **encryption** key
* All the items (products) have a parent product category and a product sub- category
* The product rating is an average of the customer ratings of that particular product

**Design Requirements:**

* Crow’s foot notation is used to construct the ERD
* Primary key in each table is specified by placing “PK” beside the fields and foreign keys as “FK”. If a “FK” is also a “PK” of an entity, both are used to depict the same
* Dashed lines are used to represent non-identifying relationships and solid lines to represent identifying relationships
* Crow's foot notation is placed next to the table where the relationship line ends to specify the many sides of the relationship
* “One” was placed next to the tables where the relationship ends to specify the one side of the relationship
* Primary key is chosen such that they uniquely identify or represent each entity and is always non-null
* Foreign key within entities contains values that are in the referenced parent primary key and thus ensures referential integrity of the data

**Design Decisions:**

|  |  |  |
| --- | --- | --- |
| **Entity Name** | **Why Entity included** | **How entity is related to other entities** |
| Customer | The whole E Commerce is based upon the key element Customer. Customer orders the products available on the platform. This entity contains a lot of personal identification information (PII). Storing this information helps in customer based purchase analytics. | The primary key customer\_id uniquely identifies the customer. Customer contains one or more addresses, orders, reviews and returns. Each customer account is provided with cart which may or may not have products. |
| Product | Product is one of the key elements in this design. Customer orders products. This entity holds attributes like name, price, manufacturer, rating, seller name, date of manufacture etc. | Each product is identified by the primary key product id. Each product is a part of product category and product sub category. Each product either comes from a seller or the company owned warehouse. |
| Address | The address entity is important from logistics perspective. It binds the customer with the seller. This entity holds the geographical details at low level. | Address is related to customer entity. Each customer must have one address and may have multiple addresses. |
| Orders | Orders entity holds the details of orders placed by the customers. It also holds the shipment details which includes the shipment date and shipping id. | Orders are one to one related to shipping info and payments. |
| Cart | Cart entity holds the products that may or may not be ordered by the customer. This is the platform where customer has the ability to proceed with the purchase transaction. | Cart is one to one related to customer and may contain zero or many products |
| CartDetail | This entity includes cartid and productid | CartDetail is one to one related to Cart |
| Review | Review entity holds the ratings and comments for a particular product which customer ordered. | One customer can give zero or many reviews. |
| Returns | Returns entity holds important information about returning details of a particular product form a customer. This information include return date, productid, orderid and delivery partner Id’s | One customer can have zero or many returns. |
| ShippingInfo | Shipping info entity holds data related to shipping such as shipping cost shipping type and delivery partner | Shipping info is one to one related to delivery partner and orders. |
| Payments | Payment entity holds all details about payment type, total payment and other billing information such as payment date and card number | Payments is one to one related to Orders. |
| OrderDetail | Order detail entity holds all the relevant information about order placed by the customer such as unit price of a product, product name | OrderDetail Entity will be one to many replationship with the order entity as one order may have one or more products. |
| DeliveryPartner | Delivery partner entity is very helpful mainly in shipping and returning of a order from customer and holds key information such as contact, name and address | Delivery partner is one to one related to shipping info and one to many related with Returns. |
| Warehouse | Warehouse entity has its use case when seller of a particular product is manufacturer itself. | Warehouse is one to many related with product |
| ProductCategory | Every product belongs to a category – basketball shoes (sports), laptop (electronics). The user search becomes easier when every product is put in it’s respective category. | ProductCategory entity will be linked to the ProductSubCategory as every laptop will be under the electronics category |
| ProductSubCategory | Sports is a category and Basketball is a sub-category. The productSubCategory entity will list the specific products belonging to that sub-category. | ProductSubCategory entity will be linked to the Product entity as every listed in the product table will belong to a subcategory of that respective product category |
| Seller | Most of the products sold on ecommerce platforms are sold by a third party vendor. The seller entity will list all the sellers who have their product listed for sale. | Seller entity will be connected to the product entity. Every product listed in the product table will have a seller associated with it. |