Ecommerce Saved Search With Flexible Products Schema

Created for the purpose of Assessment

T.O.C

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Ecommerce-ERD-for-Zammen-Assessment

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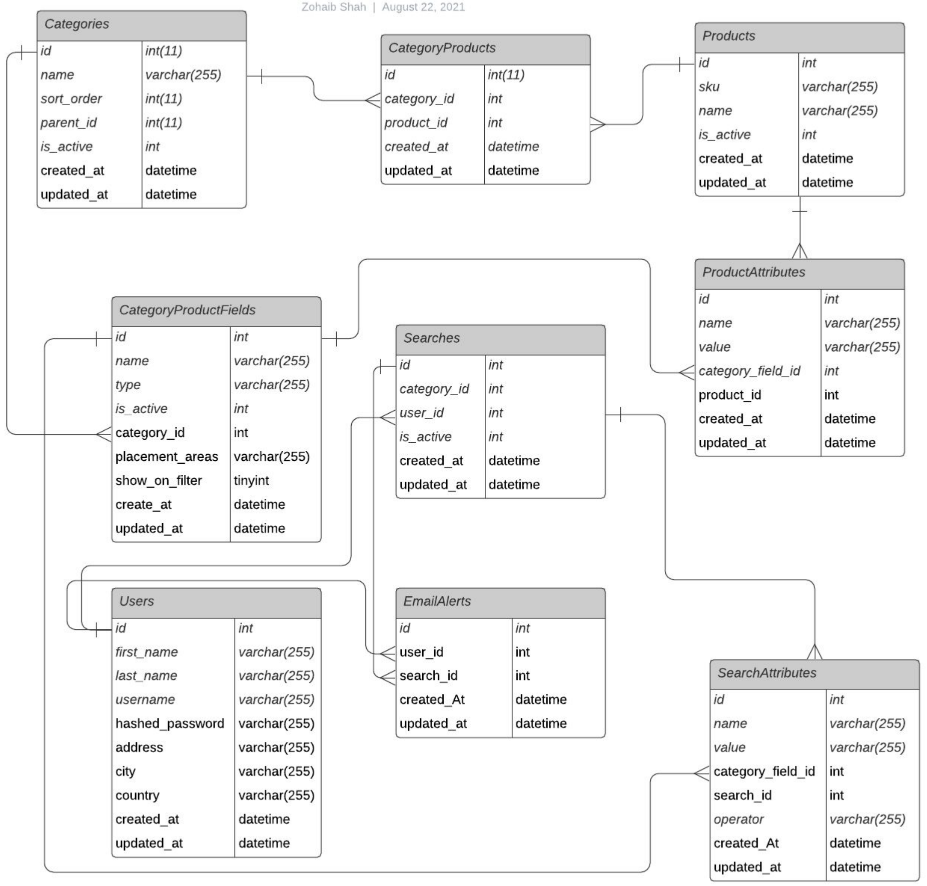

Categories

id	int(11)
name	varchar(255)
sort_order	int(11)
parent_id	int(11)
is_active	int
created_at	datetime
updated_at	datetime

CategoryProducts

id	int(11)
category_id	int
product_id	int
created_at	datetime
updated_at	datetime

Products

id	int
sku	varchar(255)
name	varchar(255)
is_active	int
created_at	datetime
updated_at	datetime

ProductAttributes

id	int
name	varchar(255)
value	varchar(255)
category_field_id	int
product_id	int
created_at	datetime
updated_at	datetime

CategoryProductFields

id	int
name	varchar(255)
type	varchar(255)
is_active	int
category_id	int
placement_areas	varchar(255)
show_on_filter	tinyint
create_at	datetime
updated_at	datetime

Searches

id	int
category_id	int
user_id	int
is_active	int
created_at	datetime
updated_at	datetime

Users

id	int
first_name	varchar(255)
last_name	varchar(255)
username	varchar(255)
hashed_password	varchar(255)
address	varchar(255)
city	varchar(255)
country	varchar(255)
created_at	datetime
updated_at	datetime

EmailAlerts

id	int
user_id	int
search_id	int
created_At	datetime
updated_at	datetime

SearchAttributes

id	int
name	varchar(255)
value	varchar(255)
category_field_id	int
search_id	int
operator	varchar(255)
created_At	datetime
updated_at	datetime

2- Database Choice

As I was working keeping assessment in mind, I preferred Structural DB .i.e. MySQL. The same concept could be applied while shifting to MongoDB.

As MongoDB does not force us to follow specific schema, We could have a “Products” collection. In this collection, we could save products of different categories (with different attributes) without any problems.

3- Understanding the mapping between entities

1- **Categories:** A category will have multiple products associated with it. A category may have a parent category if the *parent_id* field is not equals to zero.

2- **Products:** A product may belong to multiple categories. It has Many-to-Many relation with **categories** entity. A **Product** hasMany **ProductAttributes.** A product may also be associated with a user if the project allowes users to add products (I didn’t cover this aspect). **Product attributes** are separated to allow flexible products fields. For example, A product in Electronics category will have different attributes as compared to a product in **Real Estate** category.

3- Understanding the mapping between entities

3. **CategoryProductFields:** This entity will contain the information about the possible fields / attributes a product of a specific category could have. Whenever a new Product is being added, application should refer to CategoryProductFields entity for possible product attributes. Following is the little definition about it's fields:

3.1 - **name** is the name of the attribute allowed for ProductAttributes

3.2 - **type** is the type of that particular attribute .i.e. String,integer etc.

3.3 - **placement_areas** comma separated field. Could be used to identify different parts of the website and check if the particular attribute is allowed to display in that part of the website.

3.4 - **show_on_filter** if set to 1, The particular attribute will be available in filtration area of the listing page.

3- Understanding the mapping between entities

4- **ProductAttributes:** This entity will contain information about a product. Whenever a product is being added in a specific category, application should first check **CategoriesProductField** and present relevant form to add **ProductAttributes** which is more like a key, value table and mainly depend on CategoryProductField. Ideally, ProductAttributes should be used for uncommon attributes of products belonging to different categories.

3- Understanding the mapping between entities

5- **Searches:** This entity should contain searches saved by the users. Every search belongs to a Category and each Category could have multiple searches saved against it.

6- **SearchAttributes** belongs to a search. It also belongs to a CategoryProductField. The **name, value and operator** denotes the filter criteria used by the user. Like if a user has filtered for *price < 20000,* This should go into the search attributes as name=”price”,value=”20000” and operator=”<”

7- **EmailAlerts** belongs to a search, every search could have multiple alerts sent against it.

4- Achieving the Flexible Products Schema

As a product could belong to different categories, their attributes have to be different as well. We could not have a different table for every product type like one table for electronics and other for Real Estate. To fix this, we have introduced **CategoryProductFields** table and made **ProductAttributes** a key,value table.

5- Universal Save Search Mechanism

With universal product entry setup, we have also made it possible to have a universal save search mechanism. Every Search belongsTo a category and every search attribute stores the information about the searched and filtered parameter.

6- Future Considerations

1- Choice of DB could easily be shifted to MongoDB which has flexible collection schema as it’s default.

2- Current working is obviously not complete as there are many other tables needed for complete Ecommerce / Marketplace website.

3- Though the proposed structure is flexible one but implementation on application layer is challenging. Many aspects needs to be considered, we may need a coding layer to normalize the data before creating a REST API.

Thank You

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