Project Proposal

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Brand name for the project:

YLY Consultant co. is a business analytics consulting firm and the client of YLY co., James' computer and electronic retail shop hired us for data analysis. The retail is a small a shop which located in College Park, Hyattsville, and Greenbelt in Maryland. This retail shop currently faced an issue that the price of wholesale has been increasing, but the profits of the retail shop has stayed on the same level of 2021. Therefore, the owner of the retail shop wants to build insights on maximizing profit and minimizing costs based on inventory turnover ratio. Through this database management project, he wants to determine the amount of each product.

Business processes/ transactions:

The owner of James' computer and electronic retail shop, James Rhee would like YLY co. to design a conceptual schema for his retail shop, using the entity-relationship model. He represents product, order, store, manufacturers, and shipper and helps them draw up contracts. The business description include:

- Each product is classified by a unique ID, product name, sales price, and selling costs.
- Each store is described by a unique store ID, city and state information of store location, and store phone number.
- Each shipper is described by a unique shipper ID, name of shipper, and a phone number.
- Each product is sold by at least one store or less. Because there can possibly be multiple stores for a product or not.
- Each shipper ships at least one product to at least one shipper. However, if a shipper manages a specific product, then other shippers cannot ship the product.
- Each manufacturer is described by a unique ID, name of manufacturer, and a phone number.
- Each manufacturer produces at least one or more products.
- For each product that is completed by a manufacturer, there is a single shipper who signs a contract for that product, and this relationship is described by an expiration date.

ER Schema:

Entities, Attributes and Primary Keys

Product (**proId,** proName proPrice, proSellingCost)
Store (**strId**, strLocationCity, strLocationState, strPhone)
Manufacturer (**mfcId**, mfcName, mfcPhone)
Shipper (**shpId**, shpName, shpPhone)

Relationships, Degrees, and Participating Entities

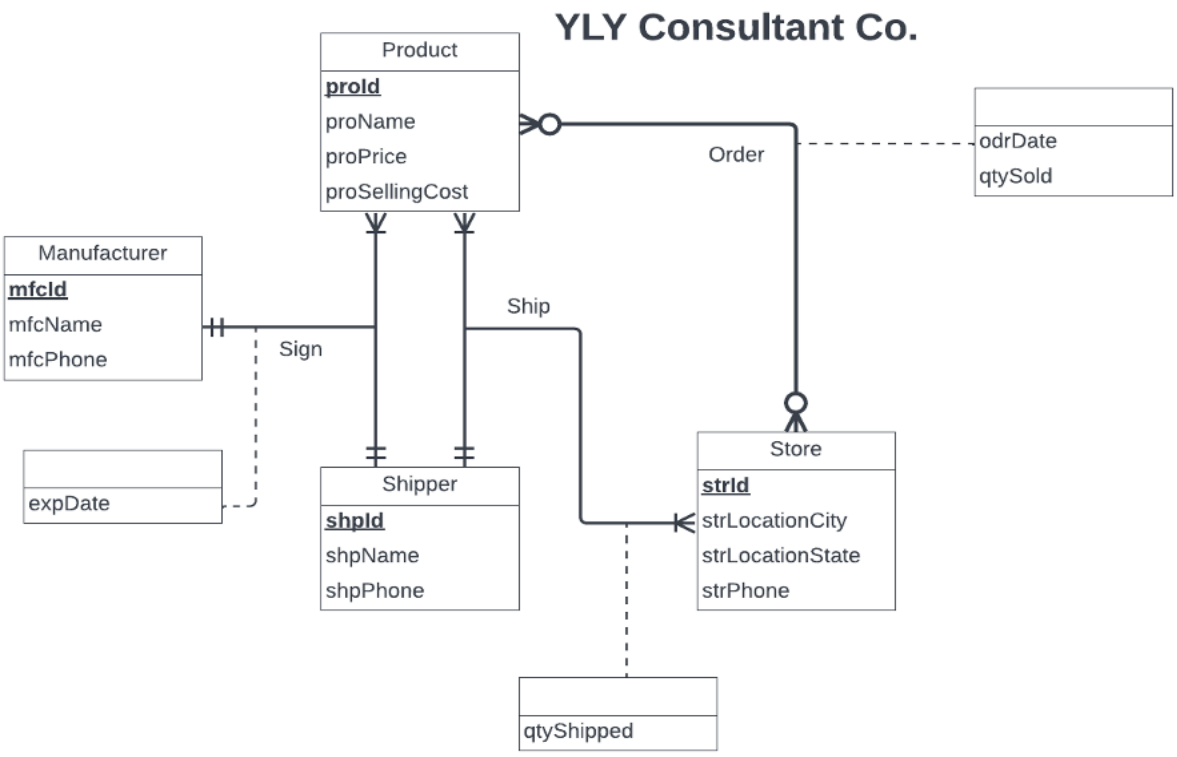
Sign (expDate): ternary relationship
1 Product and 1 Manufacture to 1 Shipper

1 Product and 1 Shipper to 1 Manufacture
1 Manufacture and 1 Shipper to 1 or more Products

Ship: ternary relationship
1 Shipper and 1 Product to 1 or more Stores
1 Store and 1 Shipper to 1 or more Products
1 Product and 1 Store to 1 Shipper

Order (orderDate, quantity): binary relationship
1 Product to 0 or more Stores
1 Store to 0 or more Products

ER Diagram:



Mission Statement:

- To develop and design a new database model with the selling data of the James' computer and electronic retail shop.

- To improve the database to enhance selling history with transparent profits of selling and real-time availability of products.

- To build insights on maximizing profits and minimizing costs through inventory management.

Mission Objectives:

- To find the profits of each product of each store in descending order.
- To find the details of the expiration date of contract of each shipper.
- To find the inventory turnover ratio for each product on each store. (The number of each product is 1,000 per each month)
- To find the dense rank and the details of order.
- To find the details of order with the accumulated product quantity sold within each store.
- To find the number of products sold on each store within 7-days from the end day of October

Relations:

Product (**proId,** proName proPrice, proSellingCost, *mfcId*)
Store (**strId**, strLocationCity, strLocationState, strPhone)
Manufacturer (**mfcId**, mfcName, mfcPhone)
Shipper (**shpId**, shpName, shpPhone)
Sign (***mfcId***, ***shpId***, ***proId,*** expDate)
Ship (***shpId***, ***proId,*** ***strId,*** qtyShipped)
Order (***proId***, ***strId,*** odrDate, qtySold)

Business rules:

[R1] When a shipper delivers a product of a manufacturer, the shipper cannot be deleted in the database.
[R2] When a shipper delivers a product of a manufacturer, the shipper information cannot be changed in the database.
[R3] When a shipper delivers a product of a manufacturer, the product cannot be deleted in the database.
[R4] When a shipper delivers a product of a manufacturer, the product information cannot be changed in the database.
[R5] When a shipper delivers a product of a manufacturer, the manufacturer cannot be deleted in the database.
[R6] When a shipper delivers a product of a manufacturer, the manufacturer information cannot be changed in the database.
[R7] When a shipper ships a product to a store, the shipper cannot be deleted in the database.
[R8] When a shipper ships a product to a store, the shipper information cannot be changed in the database.
[R9] When a shipper ships a product to a store, the product cannot be deleted in the database.
[R10] When a shipper ships a product to a store, the product information cannot be changed in the database.
[R11] When a shipper ships a product to a store, the store cannot be deleted in the database.

[R12] When a shipper ships a product to a store, the store information cannot be changed in the database.
[R13] When a store receives an order, the product cannot be deleted in the database.
[R14] When a store receives an order, the product information cannot be changed in the database.
[R15] When a store receives an order, the store cannot be deleted in the database.
[R16] When a store receives an order, the store information cannot be changed in the database.
[R17] When a manufacturer is out of business and deleted from the database, all products for the manufacturer should be deleted from the database.
[R18] When a manufacturer information is changed in the database, all product information for the manufacturer should be changed accordingly.

Referential integrities:

Relation	Foreign Key	Base Relation	Primary Key	Business Rule	Constraint: ON DELETE	Business Rule	Constraint: ON UPDATE
Sign	mfcId	Manufacturer	mfcId	R1	NO ACTION	R2	NO ACTION
Sign	shpId	Shipper	shpId	R3	NO ACTION	R4	NO ACTION
Sign	proId	Product	proId	R5	NO ACTION	R6	NO ACTION
Ship	shpId	Shipper	shpId	R7	NO ACTION	R8	NO ACTION
Ship	proId	Product	proId	R9	NO ACTION	R10	NO ACTION
Ship	strId	Store	strId	R11	NO ACTION	R12	NO ACTION
Order	proId	Product	proId	R13	NO ACTION	R14	NO ACTION
Order	strId	Store	strId	R15	NO ACTION	R16	NO ACTION
Product	mfcId	Manufacturer	mfcId	R17	CASCADE	R18	CASCADE