**MET CS 669 Database Design and Implementation for Business**

**Term Project: Retailing on Amazon**

**Section 1: Project Introduction**

**Introduction to Retailing on Amazon**

In India, are there any online marketplaces more reputable than Amazon? Probably not. Why not? For one, Amazon has successfully made use of many unique innovations. For another, Amazon has significantly systematized the selling process, structuring a generalized marketplace which virtually any retailer can plug into without much difficulty. And for yet another, Amazon has become so large that it can negotiate discounts with international organizations, including significant shipping cost discounts. Simply speaking, other online marketplaces do not compete at this level. Amazon’s online marketplace is exceptional.

Amazon’s success notwithstanding, retailers on Amazon still need to manage, pack, and ship their own products, and provide their own customer service, right? Wrong. One of Amazon’s innovations is Amazon fulfillment; Amazon handles the inventory, orders, shipping, returns, and customer service on behalf of the retailer. To plug in to the marketplace, the retailer only need deliver the products to one of Amazon’s warehouses. Amazon takes over from there. Essentially, with Amazon’s marketplace, the roles change – retailers become suppliers, and Amazon becomes the retailer.

**Use Cases**

**New Product Use Case**– This occurs when a retailer plans to sell a product it has not sold before.

1. The retailer searches Amazon’s product list to determine if another retailer is already selling the product.

2. If a different retailer is already selling the product, a new listing is not required; the retailer re‐uses the same listing.

3. If the product is not yet sold on Amazon, a new listing is created with the product’s name, description, price, and other relevant items. Every product added is linked to a product category (all categories are predefined by Amazon), for example, “Computers”, “Electronics”, “Appliances”, and similar.

**Product Delivery Use Case**– This occurs when a retailer sends one or more units of a product to Amazon so that they can be sold.

1. The retailer ships one or more units of a product to Amazon’s warehouse, along with information that indicates to Amazon what the product is, how many units there are, and the condition (new, used, etc …).

2. After Amazon receives the product(s), it updates the retailer’s inventory so that customers can purchase the product.

**New Customer Account Use Case**– This occurs when a customer signs up for an account on Amazon, so they can begin purchasing products.

1. The customer provides Amazon with basic information including a username, an address, phone number, and an email address.

2. Amazon creates an account for the customer, enabling the customer to purchase products.

**Product Purchase Use Case**– This occurs when a customer purchases a product from Amazon that was provided by a retailer.

1. The user logs in to Amazon under their account.

2. A customer selects one or more products on Amazon’s website. When selecting a product, the customer is actually selecting a particular retailer’s inventory while doing so, though they might not realize this because the process is seamless on Amazon’s website.

3. The customer selects a shipping speed (super saver shipping, standard shipping, two‐day, one‐day) and finalizes their choices.

4. Amazon decrements the retailer’s inventory for the products purchased.

5. Amazon creates an order which tracks which customer purchased which products from which retailers.

**Product Shipment Use Case**– This occurs when Amazon ships the products a customer purchased.

1. Amazon packages up the purchased products, and assigns an identifier to package so that it can be tracked.

2. Amazon links the package to the customer’s order.

3. Amazon ships the package to the default address linked to the customer’s account.

4. Amazon notifies the customer that it has been shipped and provides the customer with the tracking ID.

**Section 2: Project Breakdown**

**Structural Business Rules**

Structural business rules upfront help guide the design throughout the rest of your sections. An example of this type of business rule not related to Amazon is “A car may be driven by many drivers; each driver drives one or more cars.” Each business rule should describe the entities involved, the relationship between the entities, and the optionality and plurality constraints for each entity.

that retrieves precisely the requested information. A complete schema design and **Use Case Driven Aspects**

The use cases described in Section 1 drive what tables, stored procedures, and queries are needed for your database. There are five aspects of your database you will develop based upon these use cases, and each aspect is based on a single use case. Each aspect requires tables, a stored procedure, and a query for full implementation.The stored procedure for each aspect should be reusable through use of parameters. For example, the stored procedure for Aspect 1 should use at least four parameters for the following elements – product name, product description, product price, and product category. The query for each aspect should be one single query implementation addresses these aspects.

Your database’s tables, stored procedures, and queries only need address these aspects. It is not possible to attempt a full production‐capable database for a large enterprise such as Amazon in the time period afforded by this course; such a database would have thousands of tables. Use the information provided in Section 1 as a backdrop, then focus your design on these five aspects, which support the primary and most indispensable areas of the Amazon’s online marketplace. Do not include secondary subschemas for areas of the Amazon’s marketplace that may be important, but are not part of its core business, such as credit card and payment processing, full‐featured address management, marketing, accounting, human relations.

**Aspect 1: New Products**– This aspect is based upon the New Product Use Case in Section 1.

a. Create the tables, constraints, and data needed to support new products as described in the use case.

b. Develop a parameterized stored procedure that is used when a retailer needs to add any new product.

c. A retailer adds two new products. The first is a self‐driving video camera which automatically follows a subject that is being recorded. The second is a holographic keyboard that emits a three‐dimensional projection of a keyboard and recognizes virtual key presses from the typist. Invoke the stored procedure twice to add these products, keeping in mind that products have at a minimum a name, description, price, and category.

d. A retailer is considering developing a new electronic product, and requests a list of existing products in the “Computers” or “Electronics” categories that cost $30 or less. Develop an execute a single query that provides this information.

**Aspect 2: Product Delivery**– This aspect is based upon the Product Delivery Use Case in Section 1.

a. Create the tables, constraints, and data needed to support product delivery as described in the use case.

b. Develop a parameterized stored procedure that is used when any retailer delivers any product to Amazon’s warehouse.

c. A retailer delivers four each of the two new products added in Aspect 1 (the self‐driving video camera and the holographic keyboard). Invoke the stored procedure twice to update the inventory of these products for a retailer of your choosing.

d. The retailer from b above requests a listing of all of its products that have an inventory of 11 or less. Develop and execute a single query that provides this information (the self‐driving video camera and holographic keyboard should be among those listed).

**Aspect 3: New Customer Accounts**– This aspect is based upon the New Customer Account Use Case in Section 1.

a. Create the tables, constraints, and data needed to support customer accounts as described in the use case.

b. Develop a parameterized stored procedure that is used when any new customer signs up for a new account on Amazon.

c. You and your facilitator sign up for new accounts on Amazon. Invoke the stored procedure twice to add you and your facilitator as customers.

d. For research purposes, Amazon requests the last names of customers where there are least 5 accounts associated with the last name. Amazon would like to see the actual number of accounts associated with those last names. Develop and execute a single query that provides this information

**Aspect 4: Product Purchases**– This aspect is based upon the Product Purchase Use Case in Section 1.

a. Create the tables, constraints, and data needed to support product purchases as described in the use case.

b. Develop a parameterized stored procedure that is used when any customer purchases any product.

c. You purchase a self‐driving video camera (from Aspect 1), and your facilitator purchases three holographic keyboards. Invoke the stored procedure twice, once for each purchase.

d. The marketing department at Amazon wants to reach out to customers who buy popular products. The department requests the names and addresses of all customers who bought any product that was purchased by at least three different people. Develop and execute a single query that provides this information.

**Aspect 5: Product Shipment**– This aspect is based upon the Product Shipment Use Case in Section 1.

a. Create the tables, constraints, and data needed to support product shipments as described in the use case.

b. Develop a parameterized stored procedure that is used when Amazon ships any order.

c. Amazon ships the orders listed in Aspect 4, one to you and the other to your facilitator. Invoke the stored procedure twice, once for each order.

d. Here you define you own query. Define a request for information for this aspect that is implemented with either aggregation or with a subquery. Then develop and execute a single query that provides this information.

**Section 3: Project Summary**

My database is for an e-commerce shopping website and app named Amazon which sells millions of the product online through its website and application.

My database includes the databases for the following

1. Products
2. Transaction
3. Customer
4. Listing
5. Shipment
6. Account
7. Retailer