

Retail Database for H & M

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# Database Overview

## **Business Goals**

*Sales tracking* will help determine if a product is popular or low in demand. By knowing this information H & M can focus on reordering popular clothing items to keep up with the market and either limit, discount, or discontinue the least popular clothing items.

*Inventory status/ loss prevention* will help diminish the discrepancies between the number of items listed online and how many are in the store. An accurate inventory count is necessary to maintain the relationship between the customer and H & M. When an item is said to be available in-store on their website, and it is not when the customer arrives, H & M loses the opportunity of a sale.

*Data mining* will help H & M analyze databases to generate new information that can be used to increase profits. It will help show the relationship between the time of sale of a product or the correlation between two products. This information is helpful to ensure that profits are maximized year-round instead of only seasonally.

## **Basic Operations of the Business**

H & M is a clothing company that provides fast fashion for men, women, children, and young adults. They build relationships with vendors, place large orders with manufacturers, and outsource their operations to provide an affordable price while focusing on keeping up with the latest clothing trends. Their strong emphasis on ethics and compliance help improve sustainability so that it can make more profit over the long term.

## **Database Purpose**

This database will provide H & M with a compilation of their inventories across fifteen locations in Georgia, allowing managers to offer customers popular brands more efficiently.

## **Business Problems**

Providing H & M with a complete inventory database will solve many business problems, such as maintaining product stock, customer loyalty, and sales. The database will allow the business to maintain a scalable, consistent, and organized listing of their products and supply consumers with accurate information on product availability. The database will also provide a clear listing of transactions between the stores and customers. Therefore, the business can make informed decisions concerning their production and business goals.

## **Type of Data**

The H & M inventory database will track data regarding:

1. Store Locations – *Records 15 locations within the state of Georgia*
2. Product Availability – *Lists available products, inventory counts, and prices*
3. Sales Tracking – *Monitors the daily sale of products across fifteen store locations*

## **Tracking Information**

All three data tracking techniques will provide detailed information about H & M products and transactions to maintain customer relationships and increase financial growth. Such information would allow H & M to effectively exceed its business goals of tracking its sales and inventory status, allowing them to engage in data mining operations. Administrators may also analyze this data to make informed decisions regarding changes in promotions, catalogs, and inventories.

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# Description of Entity Relationship Diagram

## **ERD Overview**

The Retail Database for H & M will provide the company with a listing of their inventories in many of their Georgia locations. For the company to successfully monitor its product sales and inventory status while engaging in data mining, the ERD will consist of three entities:

* Product Availability
* Store Location
* Sales Tracking

See Figure 1 in Appendix for the Entity Relationship Diagram.

## **Business Logic**

The H & M database entities follow such conditions:

1. Each store can have multiple transactions.
2. Every transaction occurs in one store.
3. Each transaction contains only one product.
4. There is only one product per transaction.
5. For a transaction to occur, a product and store must exist.

## **Entity Description**

* The STORE LOCATION entity will keep track of the physical location of each H & M store in Georgia.
* The PRODUCT AVAILABILITY entity will include information about a product and inventory count.
* The SALES TRACKING entity will track the transactions by Date and Time and include information from the STORE LOCATION and PRODUCT AVAILABILITY entities across fifteen stores.

## **Cardinalities**

### *Maximum*

* Maximum Cardinality in the direction from Store Location to Sales Tracking:

STORE LOCATION ® One to Many

* Maximum Cardinality in the direction from Product Availability to Sales Tracking:

PRODUCT AVAILABILITY ® One to Many

### *Minimum*

* The Minimum Cardinality in the direction from Store Location to Sales Tracking and vice versa is mandatory (required)
* The Minimum Cardinality in the direction from Product Availability to Sales Tracking and vice versa is mandatory (required)

## **Relational Format**

STORE LOCATION (StoreID, Longitude, Latitude, Address, City, State, ZipCode)

SALES TRACKING (TransactionID, Date, Time, *StoreID*, *ProductID*)

PRODUCT AVAILABILITY (ProductID, ProductName, InventoryCount, Size, Color)

## **Database Implementation**

We implemented our E.R Model in MySQL by using the forward engineering method. This method allows us to create a script for our database model. This approach must ensure that the PK and FK are correct and that the FK fields have the same data type values as the PK. Below you will find the steps with screenshots (see Figures 2-7 in Appendix).

Step 1: Clicked on the Database tab and selected Forward Engineering

Step 2: Followed the default selections and selected Next

Step 3: Export MySQL Table Objects

Step 4: Reviewed the script and clicked Next

Step 5: Successful Forward Engineering in MySQL

## **Database MySQL**

See Figure 8 for schema, 9-11 for tables, 12 for foreign keys, and 13-15 for table data in Appendix.

## 

# Queries

### 

## **Query 1: Compound Condition**

The query below displays the products above $30 and are size small. This will help H & M determine whether their small products are priced too high and need to be lowered. If H & M decides to lower the price of their small clothing items to a range of 15 dollars to 30 dollars, they will increase their profit year-round. In theory, a product with less fabric should have a lower price.

See Figure 16-17 in Appendix for screenshots.

## **Query 2: Built-In Functions**

This query displays the product name, price, store ID, and the quantity of that product sold at the store (e.g., refer to Figure#). Such information will provide H&M with each store’s most popular product based on customer transactions. This is critical for understanding the business’ competitive advantage with their products and what products they should focus on selling.

See Figure 18-19 in Appendix for screenshots.

## **Query 3: Sub-query**

This query will display the total sales for one H&M store location for March, regardless of the year. The business can utilize this information to determine which marketing strategy (e.g., advertising, promotions, and price changes) they require during that month. Moreover, it can also help determine the store location’s financial position in March based on the number of sales.

See Figure 20-21 in Appendix for screenshots.

## **Query 4: Group By Clause**

This query shows the most popular store according to the number of transactions based on StoreID. By knowing the most popular store, H & M can focus their efforts on renovating that location and having promotions and sales to increase customer retention.

See Figure 22-23 in Appendix for screenshots.

## **Query 5 the join of two or more tables**

This query will display the total profit for all H&M locations in Georgia. This information is helpful to H&M because it provides the company with its financial position within the state. If the stores are not generating enough profit to sustain the company, then H&M may consider:

1. Reassessing their expenses
2. Changing their business, management, and/or marketing strategies
3. Closing one or more of their locations
4. Expanding their product diversity to appeal to more consumers

See Figure 24-25 in Appendix for screenshots.

## **Query 6**

This query shows the number of black products in the H & M product line. This information is helpful because compared with the H & M price list can show the business that it must focus on providing a variety of colors. The company can diversify the colors of its products to increase the number of customers purchasing its products and compete with other clothing retail stores.

See Figure 26-27 in Appendix for screenshots.

## **Query 7**

This query creates a list of all the H & M product lines along with their prices in descending orders. A price list is necessary to display what products are available and can be used to compare the product's prices with that of another clothing company. If a profitable clothing item is not on the list, H& M can add the product or increase variety by separating products into seasonal categories.

See Figure 28-29 in Appendix for screenshots.

## **Query 8**

This query shows all H&M’s store locations in Atlanta, GA. The company can use the address and zip code information to ensure equal distribution of H&M locations in the city. This will help the business to attract the most customers in multiple domains without causing the stores to compete for customers and profit.

See Figure 30-31 in Appendix for screenshots.

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# Communication of Project

# Overview

Khamilah Nixon and Michael Betancourt started working on this project on June 28th, 2022, using discord to communicate and Microsoft SharePoint to work simultaneously. Before starting the project, they brainstormed to determine what business/ organization they would select and discussed possible themes for the database and possible entities and their purpose. The following tasks were assigned to each individual:

*Khamilah Nixon’s Tasks*

* Purpose of the database
* What business problems it will solve
* What kinds of data it will keep track of
* How the database will help the organization in keeping track of information
* Description of Entity Relationship Diagram (ERD)
* Business Logic
* Cardinalities
* ERD of H & M Database
* Format and proofread paper
* Insert Data into tables
* Write Queries and descriptions
* Conclusion and lessons learned
* Appendix

*Michael Betancourt’s Tasks*

* Business and Organization:
* Business Goals
* Basic Operations of the business
* Format and proofread paper
* Entity Description
* Cardinalities
* ERD of H & M Database
* Communication section
* Timeline
* Database MySQL
* Database Implementation
* Relational Format
* Insert Data into tables
* Write Queries and descriptions
* Conclusion and lessons learned
* Appendix

## **Timeline**

June 28th, 2022: Turn in *June29\_DatabaseProject\_TeamIntroduction*

June 30th, 2022: Meet with Dr. Abraham

July 1st, 2022: Brainstorm ideas separately

July 2nd, 2022: 1st Project Meeting

July 5th, 2022: 2nd Project Meeting

July 6th 2022: Turn in *Project Milestone 1*

July 13th 2022: 3rd Project Meeting

July 14th 2022: 4th Project Meeting and Turn in *Project Milestone 2*

*July 17th 2022:* 5th Project Meeting

*July 19th 2022:* 6th Project Meeting and Turn in Final Project

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# Conclusion & Lessons Learned

The ERD provided a conceptual structure of the client’s, H&M, desired database to fit their business needs. Due to the nature of the project, the team only provided a model suiting a small portion of the H&M company to feature their inventory status, transactional, and store data. The database development team utilized the ERD to create the database schema as well as for a model to the client and other stakeholders. This model satisfies H&M’s requirements in that it relates the company’s products, stores, and sales in a one-to-many relationship to symbolize each entity’s dependency, shows whether the entities in that relation are necessary, and holds the appropriate data provided in the business logic. The team chose to provide a maximum cardinality of one-to-many from the Store Location to Sales Tracking and Product Availability to Sales Tracking entities to allow each location to have multiple transactions and each transaction to have multiple products. All entities are necessary because every transaction has a store location and product.

The ERD development process provided the database development team with extensive knowledge about how to design an ERD to fit a business model and formulate entity relationships based on that model. By constructing a small-scale database for H&M, the database development team was able to provide H&M with a functional database to determine their future business, marketing, and management strategies.

Queries help pull data from the H & M database and transform it into useful information to make informed business decisions. H&M can use the queries to analyze data and better tailor their products to suit the needs of their customers. Each query displays different types of information such as the most popular store, most popular product, most popular product by store, total profit, price list, etc. This information benefits the business because it will help them determine where to focus their money and efforts on products, stores, and locations while increasing customer satisfaction and profits. Moreover, it can compare this information with other clothing retail stores to see how H & M competes in terms of products and pricing. If a store location is not providing enough revenue or is not as popular, H & M can decide to renovate the store location by providing product diversity, closing that specific location, or changing their business strategy.

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# Appendix

Graphical user interface

Description automatically generated with low confidence

Figure 1 ERD of H&M Transactional Data

Graphical user interface, table

Description automatically generated

Figure 2 Step 1 of Database Implementation

Graphical user interface, application

Description automatically generated

Figure 3 Step 2 of Database Implementation

Graphical user interface, text, application

Description automatically generated

Figure 4 Step 2 of Database Implementation

Graphical user interface, application

Description automatically generated

Figure 5 Step 3 of Database Implementation

Graphical user interface, application

Description automatically generated

Figure 6 Step 4 of Database Implementation

Graphical user interface, application, Word

Description automatically generated

Figure 7 Step 5 in Database Implementation

Graphical user interface, text, application

Description automatically generated

Figure 8 Database Schema

Graphical user interface, text, application

Description automatically generated with medium confidence

Figure 9 Product Availability Table

Graphical user interface, application

Description automatically generated

Figure 10 Sales Tracking Table

Graphical user interface

Description automatically generated with medium confidence

Figure 11 Store Location Table

Graphical user interface, text, application

Description automatically generated

Figure 12 Foreign Keys

Text

Description automatically generated with low confidence

Figure 13 Product Availability Data

Graphical user interface, text

Description automatically generated

Figure 14 Sales Tracking Data

Graphical user interface, application

Description automatically generated

Figure 15 Store Location Data

Graphical user interface, text

Description automatically generated

Figure 16 Query 1 SQL Statements

Table

Description automatically generated

Figure 17 Query 1 Results

Graphical user interface, text, application

Description automatically generated

Figure 18 Query 2 SQL Statements

Table

Description automatically generated with medium confidence

Figure 19 Query 2 Results

Graphical user interface, text, application

Description automatically generated

Figure 20 Query 3 SQL Statements



Figure 21 Query 3 Results

Graphical user interface, text, application

Description automatically generated

Figure 22 Query 4 SQL Statements

Table

Description automatically generated

Figure 23 Query 4 Results

Graphical user interface, text

Description automatically generated

Figure 24 Query 5 SQL Statements



Figure 25 Query 5 Results

Graphical user interface, text

Description automatically generated

Figure 26 Query 6 SQL Statements

Graphical user interface, application

Description automatically generated

Figure 27 Query 6 Results

Graphical user interface, text, application

Description automatically generated

Figure 28 Query 7 SQL Statements

Table

Description automatically generated

Figure 29 Query 7 Results

Graphical user interface, text

Description automatically generated

Figure 30 Query 8 SQL Statements

Graphical user interface, text, application

Description automatically generated

Figure 31 Query 8 Results

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# References

“H & M About Us.” *H&M Group*, 25 Jan. 2022, <https://hmgroup.com/about-us/>.