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**TO:** William Cunningham

**DATE:** December 4, 2022

**RE:** Assignment 3 for DBAS 2104

Product Table CSV file Data Dictionary

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description of Data |
| MaterialDescr | Varchar (255) | Store information on the bike or accessories sold |
| Product Category | Varchar(255) | Categorizes the items sold by the company |
| Division | Varchar(255) | Shows the various divisions or locations products are distributed to |
| Internal Price | Float | Records the price associated with the sourcing of items sold by the company |
| Sale Price | Float | The price company sells its Bicycle and accessories for |
| Color | Varchar(255) | Describes the color of bike’s sold |
| Components | Varchar(255) | Identify the various components of the bicycle’s sold |

Sales Table CSV file Data Dictionary

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description |
| Year | Int | Records the year in which the purchase was made |
| Month | Int | Records the month in which the purchase was made |
| Day | Int | Records the day of the month the purchase was made |
| Customer | int | Records the customer’s unique ID number |
| OrderNumber | int | A unique number identifying each order made |
| OrderItem | int | Number recording orders made |
| Product | varchar | Uniquely identify products sold by the company |
| SalesQuantity | Int | Identify the number of items sold |
| UnitofMeasures | Varchar | Unit cost for each of the items sold |
| Revenue | Float | Records the money made by the business |
| Currency | Varchar | Identify the currency sale was made in |
| Discount | Float | Records the discount given on items |

Product Business Process Model

Diagram

Description automatically generated

Product BPM Data Dictionary

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Event/Process | Business  Purpose | Flow  From/flow to | Business Data  Inputs | Decisions? | Business Data  Outputs |  |  |  |  |  |  |
| Person Arrives | Initiating event for the whole BPM | From the start to “Requisition” | Person arrival; a phone call, an email, walk-in doorway . Pi\_d,Product\_Name,Product\_I.D,  Product\_Quantity,Product\_Type | Request items on requisition | Pi\_d,Product\_Name,  Product\_I.D,  Product\_Quantity,  Product\_Type |  |  |  |  |  |  |
| Requisition | Outlines the items been requested | From start, to the “Product Available ” process | Requisition Order is made R\_id,Product\_Name,Product\_I.D,  Product\_Quantity,Product\_Type | Fulfilment of the requisition if item is available | R\_id,P\_id,P\_Name,  Product\_ID  Product\_Quantity  , Product\_Type  Product \_Colour |  |  |  |  |  |  |
| Product is available | Indicates Whether or not the product is available | From requisition to  Product database if the product isn’t available to buy a product if the product is available | Outline whether the product is available or not  R\_id,Product\_Name,Product\_I.D,  Product\_Quantity,Product\_Type | Indicates Whether or not the Product is available | Product\_ID  Product\_Quantity  , Product\_Type  Product \_Colour |  |  |  |  |  |  |
| Buy Product | Invokes the process of purchasing products | Data flows from the product is available process | Product is bought  Product\_ID,Product\_Name  Product\_Qty,Product\_Type,  P\_Colour,P\_Cost,  P\_Discount,P\_Payment | If Product is available the requisition is fulfilled | Product\_ID,  Product\_Name  Product\_Qty  ,Product\_Type,  Product\_Colour  ,Product\_Cost,  Product\_Discount,  Product\_Payment |  |  |  |  |  |  |
| Data storage | Stores Product information | This serves to store information on products | Product information is stored in the database  Product\_ID,  Product\_Name  Product\_Qty,  Product\_Type  ,Product\_Colour,  Product\_Cost,  Product\_Discount,  Product\_Payment, | After product availability is ascertained or after the product is bought the data is transferred to the product database | Product\_ID,  Product\_Name  Product\_Qty,  Product\_Type  ,Product\_Colour,  Product\_Cost,  Product\_Discount,  Product\_Payment, |  |  |  |  |  |  |
| Was the item purchased | Used to determine whether or not the item was purchased | Dataflows from the database and goes to the Dispatch Product Process if product/products were purchased or back to the requisition process if products weren’t purchased | Information acquired during the procurement process is recorded  Product\_ID,  Product\_Name  Product\_Qty,  Product\_Type  ,Product\_Colour,  Product\_Cost,  Product\_Discount,  Product\_Payment,, | Dictates whether or not a product/products were purchased | Product\_ID,  Product\_Name  Product\_Qty,  Product\_Type  ,Product\_Colour,  Product\_Cost,  Product\_Discount,  Product\_Payment, |  |  |  |  |  |  |
| Dispatch Products | After Products have gone through the procurement process they are then dispatched to the buyers | Data flows from Was the Item purchased decision node | Information used in the dispatching process is recorded  Product\_ID,  Order\_Date,  Customer\_ID,  Customer\_Name,  Customer\_Address  Product\_ID,  Product\_Name  Product\_Qty,  Product\_Type  ,Product\_Colour,  Product\_Cost,  Product\_Discount,  Product\_Payment | Records product dispatching information | Product\_ID,  Order\_Date,  Customer\_ID,  Customer\_Name,  Customer\_Address  Product\_ID,  Product\_Name  Product\_Qty,  Product\_Type  ,Product\_Colour,  Product\_Cost,  Product\_Discount,  Product\_Payment |  |  |  |  |  |  |
| End Process | This ends the BPM | Indicates the end of the BPM |  |  |  |  |  |  |  |  |  |

Sales Business Process Model

Diagram

Description automatically generated

Sales BPM Data Dictionary

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Event/Process | Business  Purpose | Flow  From/flow to | Business Data  Inputs | Decisions? | Business Data  Outputs |  |  |  |  |  |  |
| Person Arrives | Initiating event for the whole BPM | From the start to “Customer” | Person arrival; a phone call, an email, walk-in doorway . C\_id, C\_Name | Person arrives as a potential customer | C\_id,  C\_Name |  |  |  |  |  |  |
| Customer | Records customers information | From start, to “”Would you like to purchase a bicycle or accessories” | Customer information  C\_id  , C\_Name  ,C\_address | Customer decides which item they want to purchase | C\_id  , C\_Name  ,C\_address |  |  |  |  |  |  |
| Would you like to purchase a bicycle or accessories | Indicates Customers decision to either purchase a bicycle or accessories | From customer to purchase a bicycle or accessories | Outline whether the customer would like to purchase a bike or accessories  C\_ID,  C\_Name,  C\_address  Accessory\_id,  Bicycle\_id | Indicates Whether or not the Customer will purchase a bcycle or accessory | C\_ID,  C\_Name,  C\_address  Accessory\_id,  Bicycle\_id |  |  |  |  |  |  |
| Purchase bicycle accessory | Records customers bicycle accessories purchase | Data flows from Would you like to purchase a bicycle or accessories to does customer qualify for a discount | Accessories\_id,  Accessory\_Unit\_Price,  Accessory\_Quantity  P\_Payment | Records sale of accessories | Accessories\_id,  Accessory\_Unit\_Price,  Accessory\_Quantity  P\_Payment |  |  |  |  |  |  |
| Does customer qualify for a discount | Stores discount information | Flows from purchase bicycle accessories to apply discount information or the database | Records information on whether or not customers qualify for a discount  bought  C\_ID,  C\_Name,  C\_address  Accessories\_id,  Accessory\_Unit\_Price,  Accessory\_Quantity  P\_Payment  Discount\_Amount | Dictates whether or not customer receives a discount | C\_ID,  C\_Name,  C\_address  Accessories\_id,  Accessory\_Unit\_Price,  Accessory\_Quantity  P\_Payment  Discount\_Amount |  |  |  |  |  |  |
| Apply discount information | Used to implement discount to customer account | Dataflows from does customer qualify for a discount to the database | Records discount applied to customers account  C\_ID,  C\_Name,  Discount\_amount,  Order\_Date,  Accessory\_Quantity | Assigns discount  To customer account | C\_ID,  C\_Name,  Discount\_amount,  Order\_Date,  Accessory\_Quantity |  |  |  |  |  |  |
| Purchase a bicycle | Records customers bicycle purchase | Data flows from Would you like to purchase a bicycle or accessories to does customer qualify for a discount | Bicycle\_id,  Bicycle\_Unit\_Price,  Bicycle\_Quantity  P\_Payment | Records sale of bicycle | Bicycle\_id,  Bicycle\_Unit\_Price,  Bicycle\_Quantity  P\_Payment |  |  |  |  |  |  |
| Does customer qualify for a discount | Stores discount information | Flows from purchase bicycle to apply discount information or the database | Records information on whether or not customers qualify for a discount  C\_ID,  C\_Name,  C\_address  Bicycle\_id,  Bicycle\_Unit\_Price,  Bicycle\_Quantity  P\_Payment  Discount\_Amount | Dictates whether or not customer receives a discount | C\_ID,  C\_Name,  C\_address  Bicycle\_id,  Bicycle\_Unit\_Price,  Bicycle\_Quantity  P\_Payment  Discount\_Amount | Does customer qualify for a discount | Stores discount information | Flows from purchase bicycle accessories to apply discount information or the database | Records information on whether or not customers qualify for a discount  bought  C\_ID,C\_Name,D\_amount | Dictates whether or not customer receives a discount | C\_ID,C\_Name,D\_amount |
| Apply discount information | Used to implement discount to customer account | Dataflows from does customer qualify for a discount to the database | Records discount applied to customers account  C\_ID,  C\_Name,  Discount\_amount,  Order\_Date,  Bicycle\_ID  Bicycle\_Quantity | Assigns discount  To customer account | C\_ID,  C\_Name,  Discount\_amount,  Order\_Date,  Bicycle\_ID  Bicycle\_Quantity , |  |  |  |  |  |  |
| Payment Information | Used to record payment information | Dataflows from (accessories)-  Apply discount information and Does Customer qualify for a discount  (Bicycle’s )-  Apply discount information and Does Customer qualify for a discount | C\_ID,  C\_Name,  C\_Address,  Discount\_amount,  Order\_Date,  Bicycle\_ID  Bicycle\_Quantity  Bicycle\_Unit\_Price,  P\_Payment  Accessory\_ID  Accessory\_Quantity  Accessory\_Unit\_Price, | Records customer payment information | C\_ID,  C\_Name,  C\_Address,  Discount\_amount,  Order\_Date,  Bicycle\_ID  Bicycle\_Quantity  Bicycle\_Unit\_Price,  P\_Payment  Accessory\_ID  Accessory\_Quantity  Accessory\_Unit\_Price, |  |  |  |  |  |  |
| Sales Database | Used to record information related to the sale of bicycles and accessories | Flows from payment information to the end node | C\_ID,  C\_Name,  C\_Address,  Discount\_amount,  Order\_Date,  Bicycle\_ID  Bicycle\_Quantity  Bicycle\_Unit\_Price,  P\_Payment  Accessory\_ID  Accessory\_Quantity  Accessory\_Unit\_Price, | Stores sale information | C\_ID,  C\_Name,  C\_Address,  Discount\_amount,  Order\_Date,  Bicycle\_ID  Bicycle\_Quantity  Bicycle\_Unit\_Price,  P\_Payment  Accessory\_ID  Accessory\_Quantity  Accessory\_Unit\_Price, |  |  |  |  |  |  |
| End Process | This ends the BPM | Indicates the end of the BPM |  |  |  |  |  |  |  |  |  |

Entity Relationship Diagram

Diagram

Description automatically generated

Customer Data Dictionary

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description of Data |
| PK (Customer\_ID) | Varchar(255) | Stores the unique ID which uniquely identifies each customer |
| Customer\_Name | Varchar(255) | Stores Customer’s name |
| Phone\_numnber | Varchar(255) | Used to store customer’s phone number |
| Customer\_address | Varchar(255) | Record customers address |

Product Data Dictionary

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description of Data |
| PK(Material\_Number) | Varchar(255) | Stores the unique ID which identifies Bicycles or accessories available in the store |
| Material\_Description | Varchar(255) | Records the names/types of bicycles and accessories sold by the business |
| Product\_Category | Varchar(255) | Used to store the category of products sold by the business |
| Division | Varchar(255) | Outlines the various divisions served by the business/outlines the division products are sold |
| Internal\_Price | Float | Records the price ascertained by the business to sell each product |
| Sales\_Price | Float | Records the price at which the company sells its inventory for |
| Color | Varchar(30) | Outline the color of the inventory sold by the organization |
| Components | Varchar(255) | Stores information on the various component of the bicycle’s sold |

Sales Data Dictionary

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description of Data |
| PK(Order\_num) | Int | Stores the unique ID which identifies Bicycles or accessories sold by the store |
| (FK)Customer\_id | Varchar(255) | References the primary key in the Customer table |
| (FK)SupplierID | Varchar(255) | References the primary key in the Suppliers table |
| (FK)Order\_Im | Varchar(255) | References the primary key of the sales order table |
| SYear date | Varchar(255) | Records the year a particular sale took place |
| Smonth date | Float | Records the month a particular sale took place |
| Sday date | Float | Records the day a particular sale took place |
| (FK)Product | Varchar(255) | References the Material\_Number column of the product table |
| Sales\_Quantity | Float | Stores the number of sales made on a particular bicycle/accessory |
| Unit\_of\_Measure | Float | Describes the unit of items sold by the business |
| Revenue | Float | Stores the revenue made on each product sold by the business |
| Currency | Varchar(255) | Describes the currency the store’s products were sold in |
| Discount | Float | Outline the discount given on items sold by the business |

SalesOrder Data Dictionary

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description of Data |
| PK (Order\_ID) | Varchar(255) | Stores the unique ID which uniquely identifies each order made by the company |
| Sales\_Quantity | Float | Stores the amount of sales made on a particular bicycle/accessory |
| Unit\_of\_Measure | Float | Describes the unit of items sold by the business |
| Revenue | Float | Stores the revenue made on each product sold by the business |
| Currency | Varchar(255) | Describes the currency the store’s products were sold in |
| Discount | Float | Outline the discount given on items sold by the business |

Suppliers Data Dictionary

|  |  |  |
| --- | --- | --- |
| Column Name | Data Type | Description of Data |
| PK (Supplier\_ID) | Varchar(255) | Stores the unique ID which uniquely identifies each supplier used by the business |
| Company\_Name | Varchar(255) | Stores supplier company name |
| Contact\_address | Varchar(255) | Record supplier address |
| Contact\_telephone | Varchar(12) | Used to store supplier company’s phone number |

Change Control Memo

ISSUE

After careful review of the projects specifications, the following changes have been recommended by the key stakeholders of the project

* Creation of a Data Dictionary which adequately describes the data stored in both Product and Sales CSV files
* Design a Business Process Model which depicts both the sales and product procurement process followed by the organization as well as the creation of a data dictionary to ensure a better understanding of the various entities used on the BPM diagram
* Supply an ERD for the single source of truth and the two data marts in addition to this a data dictionary should also be supplied to ensure the full understanding of the processes undertaken within the ERD Diagram
* An analysis of key data needed by both the Sales and Distribution Manager

RISK ANALYSIS

* Without a properly designed data dictionary of the CSV there is a 100 % chance of data misrepresentation
* Properly designing a BPM allows a visual representation of how data is transformed within both the distribution and sales process of the business which increases the probability of the project’s success / enables analysts to have access to relevant, accurate, and timely information to aid in the business success
* Without proper design of the er diagram and a data dictionary to explain its components we risk a 100% chance of data redundancy
* Without an analysis of the data presented both the sales and distribution manager runs a 100% risk of not making proper or the best business decision in order to foster the growth of the business

Risk Mitigation techniques

* Design a data dictionary for both sales and product CSV files
* Ensure the proper design of a Business Process Model
* Design a properly laid out ERD diagram
* Ensure referential integrity is maintained while designing the ER Diagram

ALTERNATIVES

* Do nothing
* Implement the suggested changes highlighted in the risk mitigation techniques to the project

**RECOMMENDATION**

**N.B Please see task details below**

|  |  |  |  |
| --- | --- | --- | --- |
| **Task #** | **Task Description** | **Start Date** | **Duration** |
| **Task 1** | **Creation of a Data Dictionary which adequately describes the data stored in both Product and Sales CSV files** | **November 10, 2022** | **7 Days** |
| **Task 2** | **Design a Business Process Model which depicts both the sales and product procurement process** | **November 17, 2022** | **7 Days** |
| **Task 3** | **Supply an ERD for the single source of truth and the two data marts** | **November 24, 2022** | **7 Days** |
| **Task 4** | **An analysis of key data needed by both the Sales and Distribution Manager** | **December 1, 2022** | **7 Days** |

Analysis For Manager of Sales

what are the factors that affect sales revenue?

Through the wrangling of the data, it was ascertained that there may be multiple factors that affect sales revenue however we will be looking at 2 factors Month as well as Sales Item.

As we can see the month with the highest amount of sales is June while the month with the lowest amount of sales is December ,Hence it is recommended that the Sales Manager introduce discount policies in December to increase the company’s revenue

As depicted above Elbow Pads, First Aid Kits, Fixed Gear Bike Plus, Knee Pads, Repair Kit, Road Helmets, T-shirts, Water bottles, and Water bottle cages All had very low sales when compared to other inventory sold by the business hence it is recommended that the sales manager implement discounts on the listed items

Analysis For Manager of Distribution

Through the wrangling of the data, it was ascertained that there may be multiple factors that affect the quantities of goods sold. however, we will be looking at 2 factors: Divisions and Inventory Sales

Chart, bar chart

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Through the diagram above it is quite clear that the division with the most sales is the BI division hence it is recommended that the distribution manager focus on opening more locations in the BI division

As shown in the chart above the top-selling products in the BI division are Deluxe Road Bike (Shimano),Men’s Off-Road Bike Hard Tail (SRAM), and Men’s Off-Road Bike Fully , Hence it is recommended that the distribution manager focuses on selling these items in the BI division