

IST 659: Final project

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Kings Farmers Market

Syracuse University

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# Project Introduction

## General Information

Our project is an “inventory Management Database Solution” for a company called “Kings Farmers Market”.

## Project Inspiration:

Our inspiration for undertaking this project is rooted in our professional experience. Throughout our careers, we have worked in companies facing challenges related to inventory management, supply chain management, and KPI and information visibility across the company. We notice that these kinds of problems are prevalent sectors like retail or IT. For this reason, we aimed to create a solution that addresses these two issues within a fictional company.

## Business Information:

The project will take place in a fictional company called “King’s Farmers Market”. King’s Farmers Market is a small retail company that sells consumer goods (food items) such as milk, eggs, ham, etc. It has 1 store in Syracuse NY. Fabricated current inventory and historic sales data will be created using a combination of our own created data and random generator sites like Mockaroo.com.

## Problem to address:

There are 2 main problems that this project wants to address.

1. **Information visibility:** Kings Farmers management and operation team do not have visibility of the location, and inventory of the items.
2. **Inventory Shortages:** Inventory shortages are a big pitfall in Kings Farmers Market because the procurement department doesn't know what, when, and how many to order.

## Project Features

Our project has the following features and requirements:

- Track current inventory and location for all products by category.

- Give sales trends.

- Generate reports in real-time and search, filter, and view product information.

- Give alerts and recommendations on when and how much to order for each product.

- Order tracking functionality that gives information about the status and arrival date of all the purchase orders and shipments.

# Data analysis of the facts listing entities, attributes, and relationships in the data model

We will show the E-R diagram for your entities, attributes, and relationships.

## Entities and Attributes

|  |  |  |  |
| --- | --- | --- | --- |
| **Entities and Attributes** | | | |
| **Entity** | **Attribute** | **Props** | **Description** |
| **Product** | barcode | RU | The bar code of the product |
|  | name | R | Product Name |
|  | description |  | short description of product |
|  | category | R | Category (type) of product |
|  | selling price | R | Base selling price to the customer |
|  | inv\_stock | R | Count of quatities in stock |
|  | inv\_in\_transit | RD | Inventory in transit to store |
|  | inv\_total | RD | Inventory stock + inventory in transit |
|  | min\_qty | RD | Minimum number of products based on previous years sales |
|  | purchase\_qty | RD | Suggested purchase QTY for the product to get to the 1.5\*min. qty |
|  |  |  |  |
| **Location** | name | RU | Aisle and aisle number |
|  |  |  |  |
| **Supplier** | name | R | Supplier Name |
|  | address | RC | Address location of supplier |
|  | phone\_number | R | primary contact number |
|  | email | RU | supplier contact email |
|  | lead\_time | R | Time for the order to be placed and arrive to the store in days |
|  |  |  |  |
| **store\_order** | order number | RU | store order number to supplier |
|  | date | R | Date when the order was placed |
|  | subtotal | RD | Order cost before tax (sum of order line item) = total from store\_order\_line |
|  | tax | RD | Sales tax at end of order |
|  | total | RD | Subtotal + tax |
|  |  |  |  |
| **store\_order\_line** | product | R | Purchased product by the store |
|  | unit\_price | R | baseline cost of unitary product |
|  | item\_qty | R | number of products ordered |
|  | total | RD | price x quantity |
|  | status | R | Status of the order line (Placed, in transit, arrived) |
|  | arrival\_date | RD | Estimated time of arrival: placed + lead time of the supplier |
|  |  |  |  |
| **customer\_order** | order number | RU | customer order number to store |
|  | date | R | Date when the order was placed |
|  | subtotal | RD | Order cost before tax (sum of order line item) = total from customer\_order\_line |
|  | tax | RD | Sales tax at end of order |
|  | total | RD | Subtotal + tax |
|  |  |  |  |
| **customer\_order\_line** | product | R | Purchased product by the customer |
|  | unit\_price | R | baseline cost of unitary product |
|  | item quantity | R | number of products ordered |
|  | total | RD | price x quantity |
|  |  |  |  |
| **Category** | Name | R | Category of the product |
|  |  |  |  |
| **Status** | status | R | current status of order |

## Relationships

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Relationships** | | | | | |
| **Relationship** | **Entity** | **Rule** | **Min** | **Max** | **Entity** |
| product-location | **product** | stored in | 0 | M | **location** |
|  | **location** | stores | 0 | M | **product** |
|  |  |  |  |  |  |
| product-store\_order\_line | **product** | appears on | 0 | M | **store\_order\_line** |
|  | **store\_order\_line** | contains | 1 | 1 | **product** |
|  |  |  |  |  |  |
| store\_order-store\_order\_line | **store\_order** | contains | 1 | M | **store\_order\_line** |
|  | **store\_order\_line** | contained by | 1 | 1 | **store\_order** |
|  |  |  |  |  |  |
| product-customer\_order\_line | **product** | on | 0 | M | **customer\_order\_line** |
|  | **customer\_order\_line** | contains | 1 | 1 | **product** |
|  |  |  |  |  |  |
| customer\_order-customer\_order\_line | **customer\_order** | contains | 1 | M | **customer\_order\_line** |
|  | **customer\_order\_line** | contained by | 1 | 1 | **customer\_order** |
|  |  |  |  |  |  |
| product-supplier | **product** | supplied by | 1 | 1 | **supplier** |
|  | **supplier** | supplies | 1 | M | **product** |
|  |  |  |  |  |  |
| product-category | **product** | in | 1 | 1 | **category** |
|  | **category** | contains | 0 | M | **product** |
|  |  |  |  |  |  |
| store\_order\_line-status | **store\_order\_line** | has | 1 | 1 | **status** |
|  | **status** | in | 0 | M | **store\_order\_line** |

# Conceptual Data Model Diagram

A computer screen shot of a computer

Description automatically generated

# Logical Data Model Diagram

A screenshot of a computer

Description automatically generated

# Identification of your external data model and data logic

We used the “user stories” method to identify our external data model and data logic.

We contemplated the following roles in our stories.

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Roles** | **Definition** | **Access** |
| 1 | Manager | The store manager | all functionalities |
| 2 | Inventory planner | The person in charge of the inventory | Can create store\_orders |
| 3 | Sales | Sales persons (cashier) | Can create customer\_orders |
| 4 | General User | General user | Only Read |

|  |  |  |  |
| --- | --- | --- | --- |
| **Category** | **Type** | **Features** | **User Stories** |
| Category | CUD |  | As the manager I am able to add, delete, or update category information so that we have the correct information regarding category |
| Customer\_orders | CUD |  | As a sales person I am able to add, delete or update customer orders and order lines so that we can capture the right information about sales and calculate the min. QTY accurately. |
| Inventory | Current | Track current inventory for all product | As a general user, I am able to see the inventory for each product and filter by category so that I can say if we have an item or not to the customer |
| Inventory | Alert |  | As an inventory planner, I am able to see the products that are below the min. QTY so that I can create a store order. |
| Inventory / Sales | Historic | Track historic sales for all product | As an Inventory planner, I am able to see historic sales for all products so that I can determine if I need to recommend promotions and identify trends. |
| Location | CUD |  | As a manager, I am able to add, delete or update locations so that can store products in them. |
| Location | Current | Track current location for all product | As a general user I am able to see the location for each product and filter by category so that I can guide costumers to what they are looking for. |
| Location | Change | Change location | As an Inventory planner, I am able to change the location of a product so that the correct information is shown in the application |
| Store\_order\_lines | Tracking / read | Order tracking functionality that gives information about the status and arrival date of all the purchase orders and shipments. | As a general user I am able to track store\_order lines and arrival date so that we are able to communicate to customers when are the products coming |
| Store\_orders | CUD |  | As the Inventory planner I am able to add, delete or update store orders and order lines so that we can get the right products and don’t get shortages |
| Product | CUD |  | As the manager I am able to add, delete or update product information so that we have the correct information regarding products |
| Status | CUD |  | As the manager I am able to add, delete or update statuses information so that we can track orders in a more accurate way. |
| Supplier | CUD |  | As the manager I am able to add, delete or update supplier information so that all the calculations regarding lead time are ok. |

# Basic layout and diagram of all application screens

A computer screen with many white and blue squares

Description automatically generated

# SQL Up/Down script to implement the internal model with initial data.

Both a text version and Azure workspace version of our script is embedded below.

** **

# SQL Up/Down Script to load / migrate in existing data.

 

# SQL Up/Down script of data logic for the external data model.

 

# Implementation of the application itself.

A video of the application demo is embedded below along with a zip of the .msapp export of the app.

 

# A team log recording individual and group contributions to the project including when and by whom.

|  |  |  |
| --- | --- | --- |
| **Person in charge** | **Log** | **Date of completion** |
| Krister and Francisco | Project Proposal | 10/20/2023 |
| Krister and Francisco | Entities, attributes, and relationships identification | 10/21/2023 |
| Krister and Francisco | Conceptual data model diagram | 10/23/2023 |
| Krister and Francisco | Logical data model diagram | 10/23/2023 |
| Francisco | External Model Identification (stories) | 10/29/2023 |
| Krister and Francisco | Basic Layout and diagram of the application | 11/19/2023 |
| Krister and Francisco | SQL data Logic for external model | 12/01/2023 |
| Krister | SQL load/migrate data | 11/05/2023 |
| Krister | SQL internal model, table creations | 11/12/2023 |
| Krister and Francisco | Implementation of the application | 12/02/2023 |
| Francisco | Team Log | 12/03/2023 |
| Krister | Video Demo of the application | 12/03/2023 |
| Francisco | Slide deck for the presentation | 12/03/2023 |
| N/A | Video reflection | 12/03/2023 |
| Krister and Francisco | Final Project documentation | 12/05/2023 |

# A Video recording of your team presentation.

No longer required as discussed with our professor. Presentation was provided in person.

# A Video reflection of what you learned from the experience, what you would do better if you had the time, etc.

No longer required as discussed with our professor.