Whole-ER Foods Inventory Management Database

IST 659 - Data Administration Concepts & Management

Mackenzie Houser, Blessy Thomas, Nathan Widlake

Syracuse University

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Planning

- Purpose
  - Understanding of problem
  - Outline scope and boundaries
- Outcome
  - Project charter

Problem

An up and coming grocery store is facing issues in this competitive market. Whole-ER Foods are able to get customers in with their greener, fresher, and healthier products, but are unable to supply enough products to keep up with demand. Whole-ER Foods restocks their shelfs weekly through a reliable vendor who provides all their products in bulk on Fridays. Currently, the store tracks inventory manually in MS Excel and wishes to upgrade to a Relational Database in order to improve inventory tracking to keep up with customer demand

Scope and Boundaries

- Within scope: product inventory, shipments, transactions, and general customers
- Outside of scope: employee data, customer sensitive data, building lease data, and advertisement and campaign data

Project charter

ONE-PAGE PROJECT CHARTER

PROJECT NAME	DATABASE ANALYSTS	PROJECT SPONSOR
Whole-ER Foods Inventory Management Database Transformation	Mackenzie Houser Blessy Thomas Nathan Widlake	Holier Foods, CEO

EMAIL	PHONE	ORGANIZATIONAL UNIT
mnhouser@syr.edu, bthoma16@syr.edu, ntwidlak@syr.edu	000-000-0000	Data Engineering, Analytics, Operations and Project Management

ESTIMATED START UP COSTS	ESTIMATED YEARLY COSTS	EXPECTED START DATE	EXPECTED COMPLETION
$500,000	$100,000	01/17/2023	03/28/2023

PROJECT OVERVIEW

PROBLEM OR ISSUE	An up-and-coming grocery store is facing issues in this competitive market. Whole-ER Foods can get customers in with their greener, fresher, and healthier products, but are unable to supply enough products to keep up with demand. Whole-ER Foods restocks shelfs weekly through a reliable vendor who provides all their products in bulk on Fridays.
PURPOSE OF PROJECT	Currently, the store tracks inventory manually in excel and wishes to upgrade to a relational database to improve inventory tracking to keep up with customer demand.
BUSINESS CASE	To keep up with business, Whole-ER Foods needs an efficient system to manage supply and demand. Implementing a relational database will allow for Whole-ER Foods to maintain its current customers and expand.
GOALS / METRICS	Create a reliable relational database to help inventory tracking and decision making.
EXPECTED DELIVERABLES	Design and implement a relational database.

PROJECT SCOPE

WITHIN SCOPE	product inventory, shipments, transactions, and general customers (should also have dates table)
OUTSIDE OF SCOPE	employee data, customer sensitive data (for privacy means), building lease data, advertisement, and campaign data.

TENTATIVE SCHEDULE

KEY MILESTONE	START	FINISH
Form Project Team and Conduct Preliminary Review	01/17/2023	01/24/2023
Finalize Project Plan and Project Charter	01/31/2023	02/07/2023
Conduct Analysis Phase	02/07/2023	02/14/2023
Conduct Design Phase	02/14/2023	02/21/2023
Conduct Implementation Phase	02/21/2023	02/28/2023
Conduct Maintenance Phase	03/07/2023	03/14/2023
Close Out Project and Write Summary Report	03/14/2023	03/28/2022

Analysis

- Purpose
  - Analyze the problem and capture data requirements
- Outcome
  - Conceptual data model

Informational needs

- Needs to supply enough products and improve inventory control in order to keep up with customer demand
- Needs to upgrade to a relational database

Ways to discover

- Conducting interviews (with manager/stock clerk), surveys, observations, or job-shadowing workers

Sources of information

- Store audits, warehouse receipts, invoices, POS (point of sale) data, sales orders, and purchase orders

System interfacing

- The system will interface with the POS (point of sale) system which consists of a barcode scanner and cash register

Sharing data

- The system will share its data with the project sponsor and CEO, Holier Foods

Data requirements and keys

Table / CSV File	Description
dbo.address	- Address_id [nvarchar][PK]: uuid - Primary_street [nvarchar]: street address - Secondary_street [nvarchar]: street name - City [nvarchar]: city name - Region [nvarchar]: region name - Postal_code {int]: zip code. Only #s - Country [nvarchar]: country name
dbo.product_category	- Product_category_id [nvarchar][PK]: uuid - Name [nvarchar]: name
dbo.product	- Product_id [smallint][PK]: numbered 1-500 - Product_name [nvarchar]: name - Product_price [money]: price of product in american dollars - Current_quantity [tinyint]: count of quantity in store by product - Product_category_id [nvarchar]: uuid
dbo.purchase_product	- Purchase_id [nvarchar][PK]: uuid - Product_id [smallint][PK]: numbered 1-500 - Sold_quantity [tinyint]: count of quantity sold by purchase
dbo.purchase	- Purchase_id [nvarchar][PK]: uuid - Purchase_date [date]: year/month/day - Purchase_amount [money]: base cost of transaction - Tax_amount [money]: tax amount on transaction - Discount_amount [money]: amount of savings on transaction. Could be $0
dbo.store	- Store_id [nvarchar][PK]: uuid - Store_address_id [nvarchar]: address of store location
dbo.vendor_product	- Vendor_id [nvarchar][PK]: uuid - Product_id [smallint][PK]: numbered 1-500 - Quantity_in [tinyint]: count of quantity available of product - Total_cost [money]: cost of the product offered by vendor
dbo.vendor	- Vendor_id_int_identity [nvarchar][PK]: uuid - Vendor_address_id [nvarchar]: uuid - Vendor_name [nvarchar]: name of vendor - Vendor_email [nvarchar]: email address of vendor - Vendor_phonenumber [nvarchar]: phone number with zip code of vendor
dbo.checked_out	- Store_id [nvarchar][PK]: uuid - Purchase_id [nvarchar][PK]: uuid

Entities, attributes, and relationships

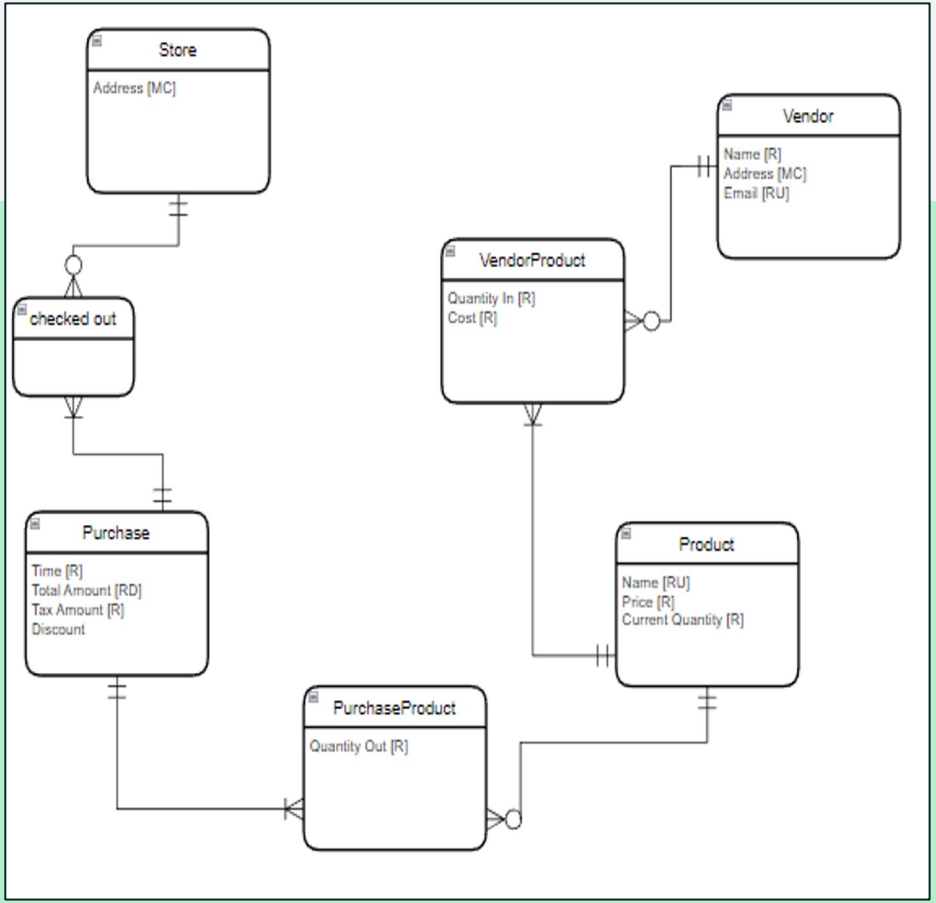
Entities and Attributes

Entity	Attribute	Props	Descripion
Product	name	RU	each product in the store
	price	R	price for the product
	Current Quantity	R	Amount in stock
	category	R	cateogry it is in
Purchase	time occurred	R	when the transaction took place
	total Amount	RD	from the price of products and tax
	Tax Percent	R	current tax amount in location
	Discount		if they are doing any promotions
	name	RU	name of the vendor
Vendor	address	MC	vendor location
	email	RU	vendor email
	address	MC	whole-er food location
Store			

Relationships

Relationship	Entity	Rule	Min	Max	Entity
Product - Purchase	**Purchase**	Sells	1	M	**Product**
	Product	Sold In	0	M	**Purchase**
Vendor-Product	**Vendor**	provides	0	M	**Products**
	Product	provided by	1	M	**Vendor**
Store - Purchase	**Store**	occurs	0	M	**Purchase**
	Purchase	Occurs in	1	M	**Store**

Conceptual data model



Design

- Purpose
  - Create specifications for solution
- Outcomes
  - Logical data model
  - Migration plan
  - Designs of forms and reports

Specifications created for solution

Overview- Specifications for Solution	
Title	Whole-ER Foods Inventory Management Database Transformation.
Description/ Goal	Create a reliable relational database to help inventory tracking and decision making.
External Users	Relational database will be used by Corporate Analytics and Supply Management teams.
Initial Status and Preconditions	Currently using excel to track and maintain inventory.

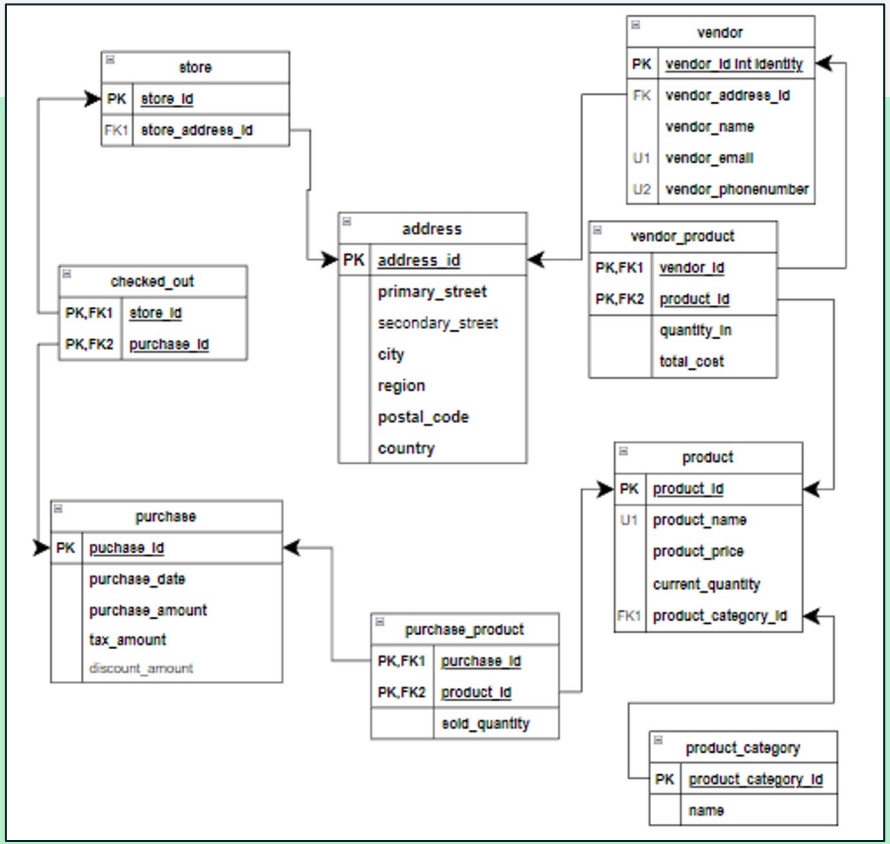
Basic Flow

Steps taken:
STEP 1: Define and understand the problem.
STEP 2: Brainstorm solutions.
STEP 3: Create a goal.
STEP 4: Analyze the problem.
STEP 5: Capture data requirements.
STEP 6: Assess and address performance needs.
STEP 7: Build conceptual model.
Steps to do:
STEP 9: Build a logical model.
STEP 10: Construct and carry out migration plan.
STEP 11: Design forms and reports.
STEP 12: Build internal, external, and physical models.
STEP 13: Test internal, external, and physical models.
STEP 14: Deploy internal, external, and physical models.
STEP 15: Produce working application.
STEP 16: Monitor and support application.
STEP 17: Track and fix issues of application.
STEP 18: Tune physical model for improved performance.

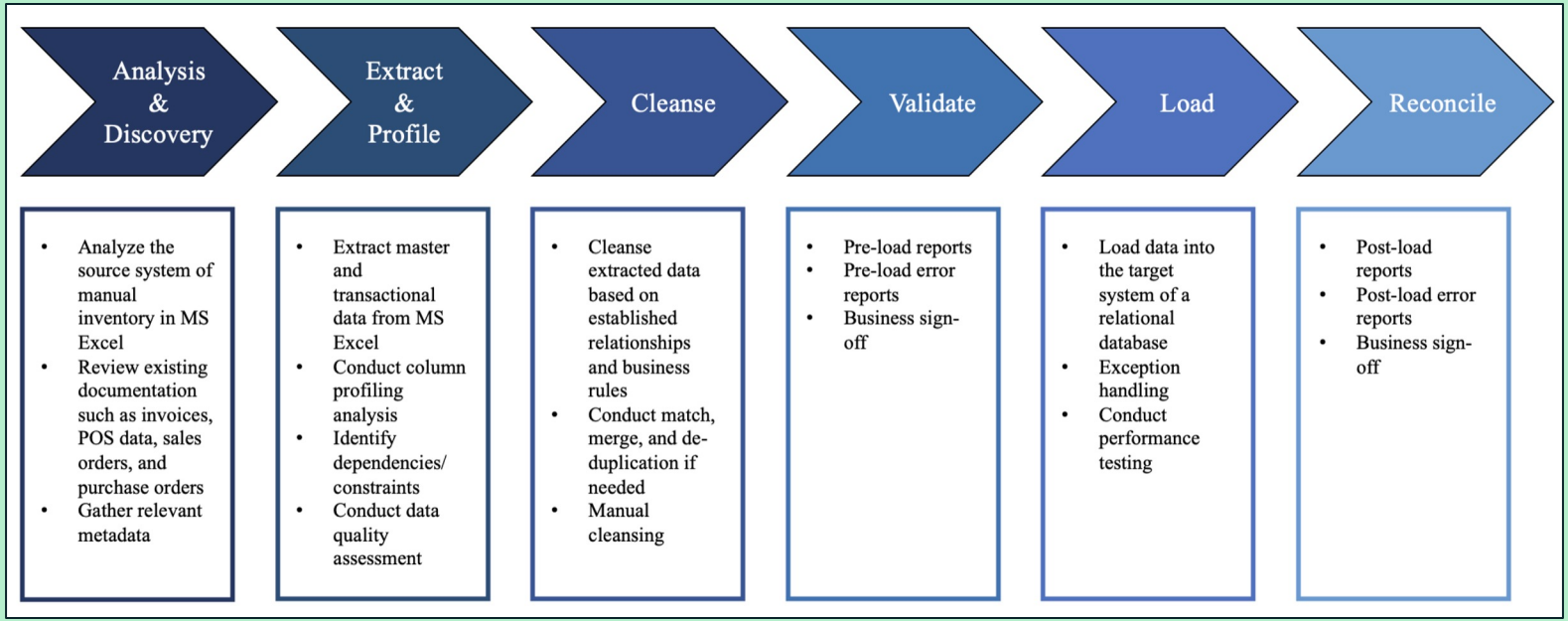
Post Condition

Successfully utilize relational database to improve inventory tracking to keep up with demand.

Logical data model



Migration plan



Designs of forms and reports

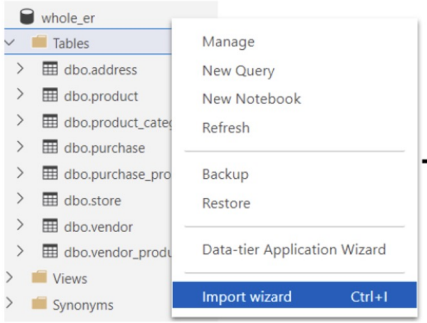
- Basic layout: How each will be designed
- Internal:
  - Database with records of products and vendors
  - Trigger notifications with when items get below threshold
  - Each table will be able to interact with one another
    - Allows for deep analysis on store status
- External:
  - Power App
  - Interact with Internal Products and Vendors
  - Update, Change, Add for Either
  - Bounces back and forth with Internal Model

Implementation

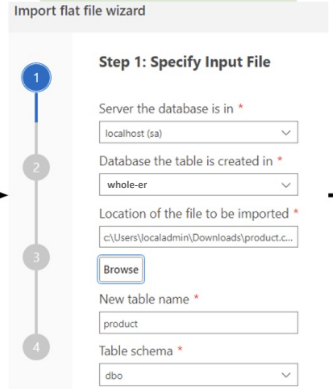
- Purpose
  - Build, test, and deploy solution
- Outcomes
  - Working application
    - Internal data model
    - External/Physical data model

Internal data model

Right click on database. Select “Import wizard”



Select file

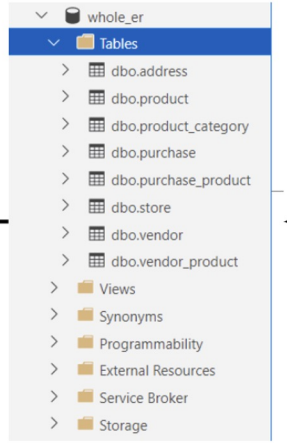


Preview data

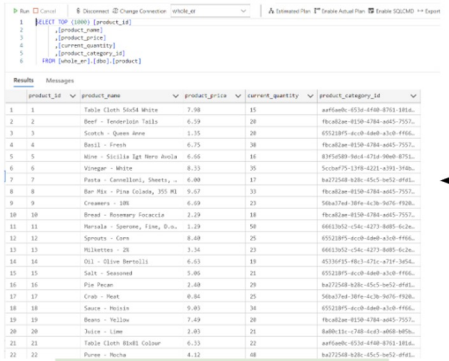
Step 3: Modify Columns

Column Name	Data Type	Primary Key	Allow Nulls
product_id	smallint	☑	☐
product_name	nvarchar(50)	☐	☐
product_price	money	☐	☐
current_quantity	tinyint	☐	☐
product_category_id	nvarchar(50)	☐	☐

Modify columns. Select PK (s) and null accepting columns



Repeat for all the tables desired in the database



Begin using active database

External data model

Whole-ER Foods Inventory

Products

Vendors

Products

Search: _____

7up Diet, 355 mL
34

Apple - Delicious, Red
31

Apricots - Dried
50

Arizona - Green Tea
41

Add Product

Product Name

Product Price

Current Quantity

Vendor

Products

Search: _____

7up Diet, 355 Ml
34

Apple - Delicious, Red
31

Apricots - Dried
50

Arizona - Green Tea
41

Product Detail

Order

Product Name

7up Diet, 355 Ml

Product Price

$6.02

Current Quantity

34

Vendor

Jenkins, Parker and Gulgowski

Edit Product

Product Name

7up Diet, 355 Ml

Product Price

$6.02

Current Quantity

34

Vendor

Jenkins, Parker and Gulgowski

Product Detail

Order

Product Name

7up Diet, 355 Ml

Product Price

$6.02

Current Quantity

34

Vendor

Jenkins, Parker and Gulgowski

Order

Order Amount

_____

Sending Order to:

dhunnama@google.co.uk

TO: dhunnama@google.co.uk
FROM: whole.er.foods@grocery.co

Dear Jenkins, Parker and Gulgowski,

Please provide [Order Amount] of 7up Diet, 355 Ml to the Whole-ER foods store.

Best,
Whole-ER Foods

SEND

Product Detail

Order

Product Name

7up Diet, 355 Ml

Product Price

$6.02

Current Quantity

34

Vendor

Jenkins, Parker and Gulgowski

Products

Search: _____

7up Diet, 355 Ml
34

Apple - Delicious, Red
31

Apricots - Dried
50

Arizona - Green Tea
41

Whole-ER Foods Inventory

Products

Vendors

Vendors

Search: _____

Jenkins, Parker and Gulgowski
dhunnama@google.co.uk

Hansen LLC
zdablingc@vistaprint.com

Rowe LLC
ebranne@bloglovin.com

Weissnat Inc
kglenisteri@quantcast.com

Add Vendor

Vendor Name

Vendor Email

Vendor Phone Number

Sells Category:

Vendors

Search: _____

Jenkins, Parker and Gulgowski
dhunnama@google.co.uk

Hansen LLC
zdablingc@vistaprint.com

Rowe LLC
ebranne@bloglovin.com

Weissnat Inc
kglenisteri@quantcast.com

Vendor Detail

Vendor Name

Jenkins, Parker and Gulgowski

Vendor Email

dhunnama@google.co.uk

Vendor Phone

515-505-2996

Sells Category:

category_o

Edit Vendor

Vendor Name

Jenkins, Parker and Gulgowski

Vendor Email

dhunnama@google.co.uk

Vendor Phone

515-505-2996

Sells Category:

category_o

Vendor Detail

Vendor Name

Jenkins, Parker and Gulgowski

Vendor Email

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Sells Category:

category_o

Vendors

Search: _____

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Hansen LLC
zdablingc@vistaprint.com

Rowe LLC
ebranne@bloglovin.com

Weissnat Inc
kglenisteri@quantcast.com

Whole-ER Foods Inventory

Products

Vendors

Data logic

- When a product order is placed, current quantity is updated
- When a product is sold, current quantity is updated
- Alert when current_quantity drops below threshold
- Alert when quantity_in goes above threshold

Maintenance

- Purpose
  - Monitor and support application
- Outcomes
  - Track and fix issues
  - Tune physical model to improve performance

Monitor and support application

- Create email for maintaining contact with customer over potential needed support
- wholer.foods-maintain@greenfoods.com

Track and fix issues

- Keep logs of our external data model's performance weekly to track any anomalies that might need to be fixed

Tune physical model to improve performance

- When we get the logs that include data - if it has errors we will send a representative to go and address the issue, to maintain a good relationship with the customer and ensure our product is up to standards