Project: DATABASE DESIGN AND IMPLEMENTATION FOR COFFEE SHOP MARKETING

New York based coffee shop chain that is looking to expand nationally by opening a number of franchise locations.

The objective is to design their relational database systems for improved operational efficiencies and to make it easier for their executives to make data driven decisions.

The data resides in several different systems: accounting software, suppliers' databases, point of sales (POS) systems, and even spreadsheets.

Therefore, i review the data in all of these systems, design a central database to house all of the data and i create the database objects, load them with source data, and create subsets of data that business partners require, export them, and then load them into staging databases that use different RDBMS.

In scenario, I worked with data from the following sources:

- Staff information held in a spreadsheet at HQ
- Sales outlet information held in a spreadsheet at HQ
- Sales data output as a CSV file from the POS system in the sales outlets
- Customer data output as a CSV file from a bespoke customer relationship management system
- Product information maintained in a spreadsheet exported from supplier's database

The following image shows sample data from each of the data sources that worked with to design new central database.

staff

staff_id	first_name	last_name	position	start_date	location
1	Sue	Tindale	CFO	08/03/2001	HQ
2	Ian	Tindale	CEO	3/8/2001	HQ
3	Marny	Hermione	Roaster	10/24/2007	WH
4	Chelsea	Claudia	Roaster	3/7/2003	WH
5	Alec	Isadora	Roaster	2/4/2008	WH
6	Xena	Rahim	Store Manager	7/24/2016	3
7	Kelsey	Cameron	Coffee Wrangler	10/18/2003	3
8	Hamilton	Emi	Coffee Wrangler	9/2/2005	3
9	Caldwell	Veda	Coffee Wrangler	9/9/2013	3
10	Ima	Winifred	Coffee Wrangler	10/12/2016	3

sales_outlet

sales_outlet_id	sales_outlet_type	address	city	telephone	postal_code	manager
2	warehouse	164-14 Jamaica Ave	Jamaica	972-871-0402	11432	
3	retail	32-20 Broadway	Long Island City	777-718-3190	11106	6
4	retail	604 Union Street	Brooklyn	619-347-5193	11215	11
5	retail	100 Church Street	New York	343-212-5151	10007	16

sales_transaction

transaction_id	transaction_date	transaction_time	sales_outlet_id	staff_id	customer_id	product_id	quantity	price
1	27/04/2019	09:53:55	8	42	0	38	2	3.75
1	27/04/2019	09:53:55	8	42	0	84	1	0.8
2	27/04/2019	08:00:34	8	42	0	51	2	3
3	27/04/2019	09:04:58	8	42	0	33	1	3.5
4	27/04/2019	08:48:32	8	42	8232	27	1	3.5
5	27/04/2019	09:21:40	8	45	8223	24	1	3

customer

customer_id	customer_name	customer_email	customer_since	customer_card_number	birthdate	gender
3001	Kelly Key	Venus@adipiscing.edu	04/01/2017	908-424-2890	29/05/1950	M
3002	Clark Schroeder	Nora@fames.gov	07/01/2017	032-732-6308	30/07/1950	M
3003	Elvis Cardenas	Brianna@tellus.edu	10/01/2017	459-375-9187	30/09/1950	M
3004	Rafael Estes	Ina@non.gov	13/01/2017	576-640-9226	01/12/1950	M
3005	Colin Lynn	Dale@Integer.com	15/01/2017	344-674-6569	01/02/1951	M

product

product_id	product_category	product_type	product_name	description	price
1	Coffee beans	Organic Beans	Brazilian - Organic	It's like Carnival in a cup. Clean and smooth.	18
2	Coffee beans	House blend Beans	Our Old Time Diner Blend	Our packed blend of beans that is reminiscent of the cup of coffee you used to get at a diner.	18
3	Coffee beans	Espresso Beans	Espresso Roast	Our house blend for a good espresso shot.	14.75
4	Coffee beans	Espresso Beans	Primo Espresso Roast	Our premium single source of hand roasted beans.	20.45
5	Coffee beans	Gourmet Beans	Columbian Medium Roast	A smooth cup of coffee any time of day.	15
6	Coffee beans	Gourmet Beans	Ethiopia	From the home of coffee.	21

Task 1: Identify entities

Task 2: Identify attributes

Task 3: Create an ERD

- Using PostgreSQL database (pgAdmin tool), I created a new database named COFFEE and tables using entities shown in the image above.

Task 4: Normalize tables

- Determine which columns should be stored in a separate table to remove the repeating rows and to put this table into second normal form.
- Determine which columns should be stored in a separate table to reduce redundant data and to put this table into second normal form.
- I created 2 new tables named product type and sales detail for and delete the moved columns from the sales transaction and product table leaving a matching column in each of two tables to later create a relationship between them.

Task 5: Define keys and relationships

- After normalizing tables, i define their primary keys and define relationships between the tables in ERD.

Task 6: Create database objects by generating and running the SQL script from the ERD Tool

- I generated an SQL script from ERD, which I could use to create database schema.

Task 7: Create a view and export the data

The external payroll company have requested a list of employees and the locations at which they work. This should not include the CEO or CFO who own the company.

In this task, i created a view in PostgreSQL database that returns this information and export the results to a CSV file using the query bellow and save as CSV file "staff_locations_view.csv":

```
SELECT STAFF.STAFF_ID,
STAFF.FIRST_NAME,
STAFF.LAST_NAME,
STAFF.LOCATION
FROM STAFF
WHERE "POSITION" NOT IN ('CEO', 'CFO');
```

Task 8: Create a materialized view and export the data

- A marketing consultant requires access the product data in their MySQL database for a marketing campaign. I created a materialized view in PostgreSQL database that returns this information using query bellow and export the results to a CSV file "product_info_m-view.csv".

```
SELECT PRODUCT.PRODUCT_NAME, PRODUCT.DESCRIPTION,
PRODUCT_TYPE.PRODUCT_CATEGORY
FROM PRODUCT
JOIN PRODUCT_TYPE
ON PRODUCT.PRODUCT_TYPE_ID = PRODUCT_TYPE.PRODUCT_TYPE_ID;
```

Task 9: Import data into a Db2 database

- The external payroll company have asked to upload the staff location information to their Db2 database. Therefore, I load a new table named STAFF_LOCATIONS with the staff location information saved in the staff_locations_view.csv file that I exported from the view created in Task 7.

Task 10: Import data into a MySQL database

- The marketing consultant has asked to upload the product information to their MySQL database. Therefore, i used phpMyAdmin to create a new database named coffee_shop_products, and then import the product information saved in the product_info_m-view.csv file from materialized view into a new table in the coffee_shop_products database.

❖ **Full Diagram | COFFEE DATABASE**