Ben's Pizzeria Analysis Project

By Hyoju Kang

Ask

Summary

Ben intends to establish a new pizzeria within his local area, which will primarily offer take-out and delivery services. He plans to utilize a relational database to capture and store essential b usiness data, with the aim of using this information to develop performance dashboards that wi ll aid in monitoring the restaurant's overall business performance.

Business Task

This analysis centers on three primary areas of focus: Orders, Stock Control, and Staff. By dir ecting his attention to these key areas, Ben is equipped to effectively manage his restaurant o perations and subsequently drive profitability.

Key Stakeholders

Ben, the owner of the pizzeria

Prepare

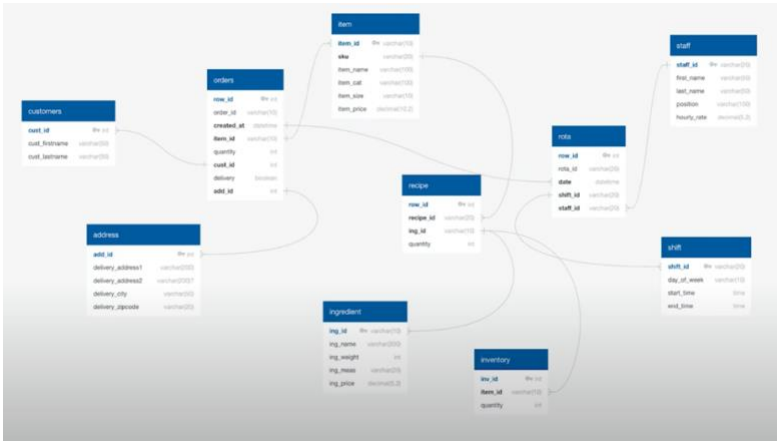
Data Source

The data is provided by Adam Finer from 'Learn BI Online' and there are limited amount of da ta since this is a simulated real-world project.

Process

Cleaning, Sorting and Filtering of Data Using Quick DBD and Excel

- Using the 'Quick DBD', original database is modified by separating table fields into simpler and efficient table.
- The primary and foreign key is assigned to indicate the relationship between new tables and original table.
- Redundant information in the rows is fixed by normalization process (reduces redundancy and improves efficiency).
- Generated database is exported as MySQL file using 'Quick DBD' and connected the SQL database with 'Navicat', the database management and development software.
- Existing CSV files are connected to imported tables.



Analyze

- **CSV file is connected with 'Navicat' software and SQL query is written**
- **Visualization is generated using Google's 'Looker Studio'**

- Order Activity Query
- Total orders
- Total sales
- Total items
- Average order value (Total Sales / Total Items)
- Sales by category
- Top selling items
- Orders by hour
- Sales by hour
- Order by address
- Orders by delivery/pick up

```sql
SELECT
  o.order_id,
  i.item_price,
  o.quantity,
  i.item_cat,
  i.item_name,
  o.created_at,
  a.delivery_address1,
  a.delivery_address2,
  a.delivery_city,
  a.delivery_zipcode,
  o.delivery
FROM
  orders o
  LEFT JOIN item i ON o.item_id = i.item_id
  LEFT JOIN address a ON o.add_id = a.add_id
```

order_id	item_price	quantity	item_cat	item_name	created_at	delivery_address1	delivery_address2	delivery_city	delivery_zipcode	delivery
109	12.00	2	Pizza	Pizza Margherita Reg	2022-08-10 13:22:00	607 Trails End Road	(NULL)	Manchester	6042	1
110	16.00	1	Pizza	Pizza Diavola (hot) Reg	2022-08-10 13:53:00	25 Cliffside Drive	(NULL)	Manchester	6042	1
111	12.00	1	Pizza	Pizza Margherita Reg	2022-08-10 13:32:00	56 Concord Road	(NULL)	Manchester	6042	1
111	16.00	1	Pizza	Pizza Diavola (hot) Reg	2022-08-10 13:32:00	56 Concord Road	(NULL)	Manchester	6042	1
112	19.00	3	Pizza	Pizza Quattro Formaggi Large	2022-08-10 19:19:00	82 Lookout Mountain Drive	(NULL)	Manchester	6040	0
112	5.00	5	Side	Breadsticks	2022-08-10 19:19:00	82 Lookout Mountain Drive	(NULL)	Manchester	6040	0
112	7.00	5	Side	Caesar Salad	2022-08-10 19:19:00	82 Lookout Mountain Drive	(NULL)	Manchester	6040	0
112	6.00	1	Dessert	Strawberry Ice cream	2022-08-10 19:19:00	82 Lookout Mountain Drive	(NULL)	Manchester	6040	0
112	2.00	1	Drink	San Pelligrino 33cl	2022-08-10 19:19:00	82 Lookout Mountain Drive	(NULL)	Manchester	6040	0
113	19.00	1	Pizza	Pizza Quattro Formaggi Large	2022-08-10 19:19:00	21 Carver Lane	(NULL)	Manchester	6040	1
113	16.00	1	Pizza	Pizza Napolitana Reg	2022-08-10 20:45:00	21 Carver Lane	(NULL)	Manchester	6040	1
113	6.00	2	Dessert	Pistachio Ice cream	2022-08-10 20:45:00	21 Carver Lane	(NULL)	Manchester	6040	1
113	6.00	1	Dessert	Chocolate Ice cream	2022-08-10 20:45:00	21 Carver Lane	(NULL)	Manchester	6040	1

- Inventory Management Query
- Total quantity by ingredient (Ordered Weight)
- Total cost of ingredients (Ingredient_cost)
- Calculated cost of pizza
- Percentage stock remaining by ingredient
- List of ingredients to re-order based on remaining inventory

```sql
SELECT
  s1.item_name AS item_name,
  s1.ing_name AS ing_name,
  s1.ing_id AS ing_id,
  s1.ing_weight AS ing_weight,
  s1.ing_price AS ing_price,
  s1.order_quantity AS order_quantity,
  s1.recipe_quantity AS recipe_quantity,(
    s1.order_quantity * s1.recipe_quantity
    ) AS ordered_weight,(
    s1.ing_price / s1.ing_weight
    ) AS unit_cost,((
      s1.order_quantity * s1.recipe_quantity
    ) * ( s1.ing_price / s1.ing_weight )) AS ingredient_cost
FROM
  (
  SELECT
    o.item_id AS item_id,
    i.sku AS sku,
    i.item_name AS item_name,
    r.ing_id AS ing_id,
    ing.ing_name AS ing_name,
    ing.ing_weight AS ing_weight,
    ing.ing_price AS ing_price,
    sum( o.quantity ) AS order_quantity,
    r.quantity AS recipe_quantity
  FROM
    (((
          orders o
          LEFT JOIN item i ON ((
              o.item_id = i.item_id
            )))
        LEFT JOIN recipe r ON ((
            i.sku = r.recipe_id
          )))
      LEFT JOIN ingredient ing ON ((
          ing.ing_id = r.ing_id
        )))
  GROUP BY
    o.item_id,
    i.sku,
    i.item_name,
    r.ing_id,
    r.quantity,
    ing.ing_weight,
  ing.ing_price
  ) s1
```

item_name	ing_name	ing_id	ing_weight	ing_price	order_quantity	recipe_quantity	ordered_weight	unit_cost	ingredient_cost
Pizza Margherita Reg	Dried oregano	ING004	500	5.99	18	5	90	0.011980	1.078200
Pizza Margherita Reg	Mozzarella cheese	ING003	2500	14.45	18	170	3060	0.005780	17.686800
Pizza Margherita Reg	Tomato sauce	ING002	4500	3.89	18	80	1440	0.000864	1.244799
Pizza Margherita Reg	Pizza dough ball (8 pack)	ING001	2000	4.22	18	250	4500	0.002110	9.495000
Pizza Diavola (hot) Reg	Chilli pepper	ING006	1000	6.49	30	10	300	0.006490	1.947000
Pizza Diavola (hot) Reg	Spicy salami	ING005	3500	37.64	30	50	1500	0.010754	16.131428
Pizza Diavola (hot) Reg	Mozzarella cheese	ING003	2500	14.45	30	170	5100	0.005780	29.478000
Pizza Diavola (hot) Reg	Tomato sauce	ING002	4500	3.89	30	80	2400	0.000864	2.074666
Pizza Diavola (hot) Reg	Pizza dough ball (8 pack)	ING001	2000	4.22	30	250	7500	0.002110	15.825000
Pizza Quattro Formaggi Large	Ricotta cheese	ING010	1500	3.99	39	180	7020	0.002660	18.673200
Pizza Quattro Formaggi Large	Gorgonzola cheese	ING009	3500	27.64	39	180	7020	0.007897	55.437937
Pizza Quattro Formaggi Large	Parmesan cheese	ING008	2500	18.75	39	180	7020	0.007500	52.650000
Pizza Quattro Formaggi Large	Mozzarella cheese	ING003	2500	14.45	39	200	7800	0.005780	45.084000
Pizza Quattro Formaggi Large	Tomato sauce	ING002	4500	3.89	39	100	3900	0.000864	3.371332

```sql
select
s2.ing_name,
s2.ordered_weight,
ing.ing_weight,
inv.quantity,
ing.ing_weight * inv.quantity AS total_inv_weight
FROM
  ( SELECT ing_id, ing_name, sum( ordered_weight ) AS ordered_weight FROM stock1 GROUP BY ing_name, ing_id ) s2
  LEFT JOIN inventory inv ON inv.item_id = s2.ing_id
  LEFT JOIN ingredient ing ON ing.ing_id = s2.ing_id
```

ing_name	ordered_weight	ing_weight	quantity	total_inv_weight
Dried oregano	146	500	4	2000
Mozzarella cheese	42300	2500	40	100000
Tomato sauce	20600	4500	25	112500
Pizza dough ball (8 pack)	78650	2000	50	100000
Chilli pepper	705	1000	4	4000
Spicy salami	3390	3500	2	7000
Ricotta cheese	10320	1500	10	15000
Gorgonzola cheese	10320	3500	10	35000
Parmesan cheese	13850	2500	10	25000
Caesar dressing	740	3800	5	19000
Romain lettuce	3700	7500	5	37500
Croutons	1850	1250	5	6250
Rotisserie chicken pieces	4440	5000	5	25000
Strawberry ice cream	900	4500	2	9000
San Pelligrino 33cl	4	1	120	120

- <u>Staff Query</u>

- Total staff cost
- Total hours worked
- Hours worked by staff member
- Cost per staff member

```
SELECT
  r.date,
  s.first_name,
  s.last_name,
  s.hourly_rate,
  sh.start_time,
  sh.end_time,
  ((
      HOUR (
      timediff( sh.end_time, sh.start_time ))* 60
      )+(
      MINUTE (
      timediff( sh.end_time, sh.start_time ))))/ 60 AS hours_in_shift,
  ((
      HOUR (
      timediff( sh.end_time, sh.start_time ))* 60
      )+(
      MINUTE (
      timediff( sh.end_time, sh.start_time ))))/ 60 * s.hourly_rate AS staff_cost
FROM
  rota r
  LEFT JOIN staff s ON r.staff_id = s.staff_id
  LEFT JOIN shift sh ON r.shift_id = sh.shift_id
```

date	first_name	last_name	hourly_rate	start_time	end_time	hours_in_shift	staff_cost
2022-08-10 00:00:00	Mindy	Sloan	17.25	10:30:00	14:30:00	4.0000	69.000000
2022-08-10 00:00:00	Luqman	Cantu	21.50	10:30:00	14:30:00	4.0000	86.000000
2022-08-10 00:00:00	Lilly-Rose	Vaughn	14.50	10:30:00	14:30:00	4.0000	58.000000
2022-08-10 00:00:00	Desiree	Gardner	14.50	10:30:00	14:30:00	4.0000	58.000000
2022-08-10 00:00:00	Mindy	Sloan	17.25	18:30:00	23:00:00	4.5000	77.625000
2022-08-10 00:00:00	Luqman	Cantu	21.50	18:30:00	23:00:00	4.5000	96.750000
2022-08-10 00:00:00	Lilly-Rose	Vaughn	14.50	18:30:00	23:00:00	4.5000	65.250000
2022-08-10 00:00:00	Desiree	Gardner	14.50	18:30:00	23:00:00	4.5000	65.250000
2022-08-11 00:00:00	Mindy	Sloan	17.25	10:30:00	14:30:00	4.0000	69.000000
2022-08-11 00:00:00	Luqman	Cantu	21.50	10:30:00	14:30:00	4.0000	86.000000
2022-08-11 00:00:00	Lilly-Rose	Vaughn	14.50	10:30:00	14:30:00	4.0000	58.000000
2022-08-11 00:00:00	Desiree	Gardner	14.50	10:30:00	14:30:00	4.0000	58.000000

<u>Share and Act</u>

- Dimension and Metric is customized with the SQL dump files generated by using 'Navicat'
- New fields are produced for particular caculations such as cost of pizza (recipe_quantity * unit_cost)
- The theme of the dashboard is customized based on the menu image that Ben provided
- Date filter is applied to the dashboard since data will be added in the future
- Chart's grid lines are adjusted to the lighter color to prevent possible distraction to the viewers

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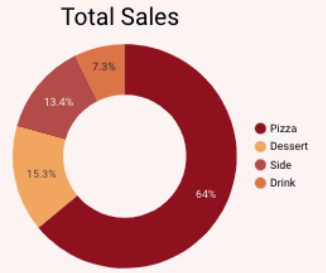
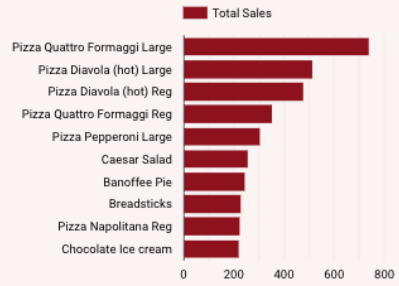
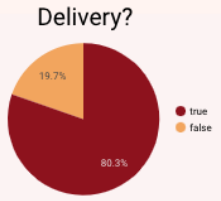
Orders

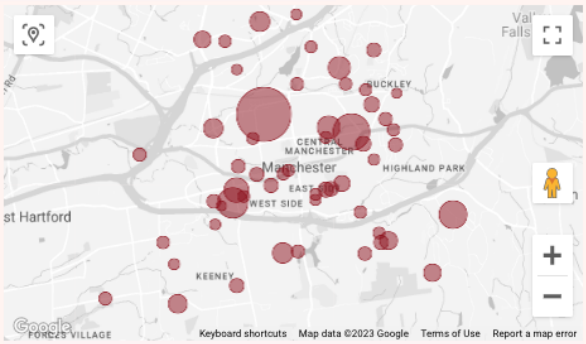
Total Orders	Total Sales	Total Items	Avg Order Value
58	$5.97K	626	$102.88

Select date range









Total Sales 16 637

Inventory

ingredient_cost
1,008.47

Aug 10, 2022 - Aug 10, 2022

	ing_name	Total Quantity	Total Cost	Percent Remaining
1.	Banoffee pie	4,200	4.02	-75%
2.	Anchovies	1,850	20.33	7.5%
3.	Pizza dough ball (8 pack)	78,650	165.95	21.35%
4.	Ricotta cheese	10,320	27.45	31.2%
5.	Chocolate brownie	3,225	5.74	35.5%
6.	Parmesan cheese	13,850	103.88	44.6%
7.	Spicy salami	3,390	36.46	51.57%
8.	Mozzarella cheese	42,300	244.49	57.7%
9.	Chocolate ice cream	3,700	12.7	58.89%
10.	Croutons	1,850	7.77	70.4%
11.	Gorgonzola cheese	10,320	81.5	70.51%
12.	Fruit salad	2,850	4.06	71.5%
13.	Pepperoni	6,320	61.13	74.72%
14.	Fanta Regular 33cl	29	11.89	75.83%
15.	Tuna	1,250	4.79	79.17%
16.	Tomato sauce	20,600	17.81	81.69%
17.	Rotisserie chicken pieces	4,440	30.59	82.24%
18.	Chilli pepper	705	4.58	82.38%
19.	Calamari	1,250	14.39	83.33%
20.	Chicken wings	3,600	41.9	85%
21.	Eggplant	2,580	4.9	87.1%
22.	Shrimp	1,250	11.23	87.5%

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	item_name	Cost ...
1.	Pizza Seafood Large	$6.13
2.	Pizza Seafood Reg	$5.23
3.	Pizza Quattro Formaggi Reg	$4.29
4.	Pizza Quattro Formaggi Large	$5.13
5.	Pizza Parmigiana Reg	$3.08
6.	Pizza Hawaiian Reg	$2.55
7.	Pizza Napolitana Large	$2.45
8.	Pizza Diavola (hot) Reg	$2.18
9.	Pizza Napolitana Reg	$2.7
10.	Pizza Parmigiana Large	$3.66
11.	Pizza Hawaiian Large	$3
12.	Pizza Diavola (hot) Large	$2.73
13.	Pizza Pepperoni Reg	$3.51
14.	Pizza Pepperoni Large	$4.2
15.	Pizza Margherita Large	$1.97
16.	Pizza Margherita Reg	$1.64

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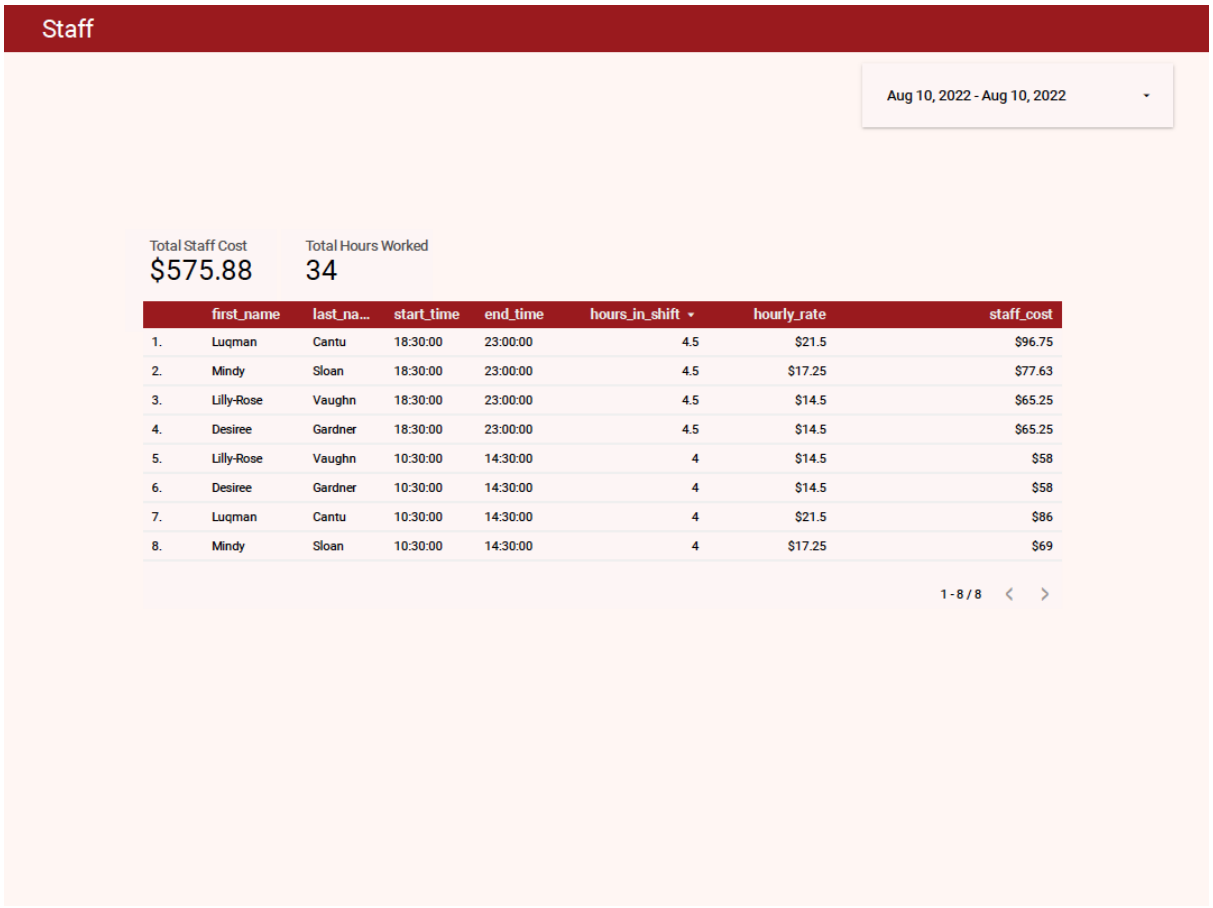

	first_name	last_na...	start_time	end_time	hours_in_shift	hourly_rate	staff_cost
1.	Luqman	Cantu	18:30:00	23:00:00	4.5	$21.5	$96.75
2.	Mindy	Sloan	18:30:00	23:00:00	4.5	$17.25	$77.63
3.	Lilly-Rose	Vaughn	18:30:00	23:00:00	4.5	$14.5	$65.25
4.	Desiree	Gardner	18:30:00	23:00:00	4.5	$14.5	$65.25
5.	Lilly-Rose	Vaughn	10:30:00	14:30:00	4	$14.5	$58
6.	Desiree	Gardner	10:30:00	14:30:00	4	$14.5	$58
7.	Luqman	Cantu	10:30:00	14:30:00	4	$21.5	$86
8.	Mindy	Sloan	10:30:00	14:30:00	4	$17.25	$69

Results of Analysis

- Data indicates that the average order value is approximately $100
- Pizza is the most popular category, followed by Dessert, side, and drink
- The most popular item among all menu items is the large size of 'Pizza Quattro F ormaggi'
- Customers tend to choose the delivery method rather than pick-up
- The map indicates that while many customers are clustered within the Central Man chester area, customers who order pizza are evenly distributed throughout Manche ster
- The number of orders is highest during lunch and dinner time (1 PM and 7 PM) c ompared to other times of the day.

Next Steps

- Ben can estimate the monthly sales and manage his budget for the future if he intends t o extend the scale of his pizzeria
- Ben should consider developing his menu with a focus on dessert items rather tha n side dishes
- Ben can create a new pizza item similar to 'Pizza Quattro Formaggi,' as it is the most popular item in his pizzeria
- Ben review the map and determine the number of riders to assign to specific area s or consider opening a second pizzeria based on the frequency of orders from cu stomers
- Ben can decrease the number of staff or riders during times when orders are infre quent.