



The Pizza Project

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Step 1 – Ask

In this step we will identify the problem and objective of our case study and present our results.

Background –

You have been contacted by your local pizza store to analyze a year's worth of sales that involves customers order details and ranges all the way to every ingredient used in all the pizzas.

As a data analyst, Kidus is extremely confident that with his knowledge of SQL and Tableau, he can use these tools to discover trends and patterns to foster data driven decision making.

Business objectives –

- What trends can be identified?
- Where and when does most of our revenue come from?
- How can these trends and the variables that affect them help the local pizza store in making data driven decision making?

Deliverables –

- Summary of the business objectives
- Description of data source
- Summary of the analysis
- Visualizations and key findings
- Recommendations

Stakeholders –

- The owner of the local pizza store.

Step 2 – Prepare

In this step we will identify the data being used.

Information on data source –

This data was collected from Maven Analytics, found here, [Maven Analytics](#). This data contains 12 fields with over 48,000 number of records.

Data includes 4 tables that are orders, order details, pizzas, and pizza types. Columns that have information on date, time, quantity, size, price, category, and more.

Is data ROCCC?

A good data source is ROCCC which stands for Reliable, Original, Comprehensive, Current, and Cited.

- Reliable – HIGH – Dataset has over 48,00 records for 12 different fields
- Original – HIGH – Easily available to the public
- Comprehensive – MED – Just the right amount of fields to gather insightful analysis.
- Current – LOW – Older than 5 years
- Cited – Yes

Step 3 - Process

Thanks to the creators of Maven Analytics they have provided us with a cleaned dataset, however we had to change the file coding in Cot Editor from Unicode(UTF-8) with BOM to Unicode(UTF-8). This was because there were error codes occurring when trying to import the dataset into MySQL.

Dataset –

This dataset is consistent and shows the data and time columns to be in the right data type. There are primary and foreign keys in each of the 4 tables to join all the tables to one another. Although the ingredients column will need to be broken individually to get a concise analysis on it, we will solve that in the later step.

Step 4 - Analyze

Key tasks for analysis –

1. Count of orders and quantities sold by month, day of week, and hour
2. Quantity of every pizza sold by month
3. Quantity sold and revenue gained from most popular sizes
4. Quantity sold and revenue gained from most popular category of pizza
5. Total Sales per quarter
6. Total Revenue of every pizza
7. Average revenue per order
8. Number of pizzas with each ingredient

Query 1(3 Queries) Results –

```

SELECT
    MONTHNAME(o.date) as Month,
    COUNT(DISTINCT(od.order_id)) as Number_of_orders,
    SUM(od.quantity) as Quantity_of_Pizzas_Sold
FROM
    PizzaProject.order_details od
JOIN
    PizzaProject.orders o ON o.order_id = od.order_id
GROUP BY
    MONTHNAME(o.date)
ORDER BY
    MONTHNAME(o.date)
;

```

Month	Number_of_orders	Quantity_of_Pizzas_Sold
April	1799	4151
August	1841	4168
December	1680	3935
February	1685	3961
January	1845	4232
July	1935	4392
June	1773	4107
March	1840	4261
May	1853	4328
November	1792	4266
October	1646	3883
September	1661	3890

```

SELECT
    DAYNAME(o.date) as Day_of_week,
    COUNT(DISTINCT(od.order_id)) as Number_of_orders,
    SUM(od.quantity) as Quantity_of_Pizzas_Sold
FROM
    PizzaProject.order_details od
JOIN
    PizzaProject.orders o ON o.order_id = od.order_id
GROUP BY
    DAYNAME(o.date)
ORDER BY
    FIELD(Day_of_week, 'Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday')
;

```

Day_of_week	Number_of_orders	Quantity_of_Pizzas_Sold
Monday	2794	6485
Tuesday	2973	6895
Wednesday	3024	6946
Thursday	3239	7478
Friday	3538	8242
Saturday	3158	7493
Sunday	2624	6035

```

SELECT
    EXTRACT(HOUR FROM o.time) as Hour_of_day,
    COUNT(DISTINCT(od.order_id)) as Number_of_orders,
    SUM(od.quantity) as Quantity_of_Pizzas_Sold
FROM
    PizzaProject.order_details od
JOIN
    PizzaProject.orders o ON o.order_id = od.order_id
GROUP BY
    EXTRACT(HOUR FROM o.time)
;

```

Hour_of_day	Number_of_orders	Quantity_of_Pizzas_Sold
9	1	4
10	8	18
11	1231	2728
12	2520	6776
13	2455	6413
14	1472	3613
15	1468	3216
16	1920	4239
17	2336	5211
18	2399	5417
19	2009	4406
20	1642	3534
21	1198	2545
22	663	1386

Query 2 Results –

```

SELECT
    r.Pizza_name,
    SUM(CASE WHEN month = 1 THEN quantity ELSE 0 END) AS 'Jan',
    SUM(CASE WHEN month = 2 THEN quantity ELSE 0 END) AS 'Feb',
    SUM(CASE WHEN month = 3 THEN quantity ELSE 0 END) AS 'Mar',
    SUM(CASE WHEN month = 4 THEN quantity ELSE 0 END) AS 'Apr',
    SUM(CASE WHEN month = 5 THEN quantity ELSE 0 END) AS 'May',
    SUM(CASE WHEN month = 6 THEN quantity ELSE 0 END) AS 'Jun',
    SUM(CASE WHEN month = 7 THEN quantity ELSE 0 END) AS 'Jul',
    SUM(CASE WHEN month = 8 THEN quantity ELSE 0 END) AS 'Aug',
    SUM(CASE WHEN month = 9 THEN quantity ELSE 0 END) AS 'Sep',
    SUM(CASE WHEN month = 10 THEN quantity ELSE 0 END) AS 'Oct',
    SUM(CASE WHEN month = 11 THEN quantity ELSE 0 END) AS 'Nov',
    SUM(CASE WHEN month = 12 THEN quantity ELSE 0 END) AS 'Dec'
FROM
    PizzaProject.order_details od
JOIN
    PizzaProject.pizzas p ON p.pizza_id = od.pizza_id
JOIN
    PizzaProject.pizza_types pt ON pt.pizza_type_id = p.pizza_type_id
JOIN
    PizzaProject.orders o ON o.order_id = od.order_id
GROUP BY
    pt.name,
    MONTH(o.date)
)
;

Pizza_name      Jan   Feb   Mar   Apr   May   Jun   Jul   Aug   Sep   Oct   Nov   Dec
The Barbecue Chicken Pizza 211  193   231   214   226   194   219   187   192   168   221   176
The Big Meat Pizza         150  151   176   139   190   139   185   160   142   151   174   157
The Brie Carre Pizza        35   44    46    32    46    40    44    43    49    34    42    35
The Calabrese Pizza         67   86    65    83    84    90    83    73    66    81    94    65
The California Chicken Pizza 202  204   194   176   199   222   187   231   177   162   209   207
The Chicken Alfredo Pizza   86   74    100   74    85    83    73    83    81    80    93    75
The Chicken Pesto Pizza     77   82    81    89    79    79    85    81    84    72    82    82
The Classic Deluxe Pizza    190  173   204   216   218   197   227   208   209   196   218   197
The Five Cheese Pizza       138  113   125   107   124   124   139   113   115   113   109   89
The Four Cheese Pizza       159  160   165   162   182   148   162   139   147   169   149   160
The Greek Pizza             129  105   110   150   123   115   120   112   107   106   133   110
The Green Garden Pizza      75   88    88    82    91    87   101   81    91    85    63    65
The Hawaiian Pizza         185  198   217   219   198   189   195   201   196   188   227   209
The Italian Capocollo Pizza 126  121   118   129   118   127   133   117   110   106   111   122
The Italian Supreme Pizza   167  142   152   172   176   171   146   167   137   139   172   143
The Italian Vegetables Pizza 100  87    87    87    87    72    72    78    72    82    72    85
The Mediterranean Pizza     68   65    78    79    92    75    87    77    76    65    87    85
The Mexicana Pizza         132  107   130   130   104   122   148   124   102   113   157   115
The Napolitana Pizza       136  113   108   119   116   143   123   139   119   130   115   103
The Pepper Salami Pizza     131  108   123   131   115   127   124   109   102   127   128   121
The Pepperoni Pizza         239  205   187   171   241   162   224   213   198   199   196   183
The Pepperoni, Mushroom,... 102  112   116   110   120   127   124   133   121   105   88    101
The Prosciutto and Arugula... 134  123   127   109   114   111   132   121   113   136   124   113
The Sicilian Pizza          191  160   155   155   150   167   151   160   144   168   178   159
The Soppressata Pizza       79   76    78    94    87    85    85    79    65    90    72    71
The Southwest Chicken Pizza 138  155   175   171   155   144   178   170   163   159   168   141
The Spicy Italian Pizza     153  144   174   152   188   165   193   155   130   151   166   153
The Spinach and Feta Pizza  126  108   137   120   137   117   127   140   111   88    119   116
The Spinach Pesto Pizza     77   75    92    60   94    90    78    86   88    60    95    75
The Spinach Supreme Pizza   87   81    71    85    85    84    83    84    71    72    74    73
The Thai Chicken Pizza      199  167   213   200   195   188   221   182   203   191   208   204
The Vegetables + Vegetabl... 143  141   138   134   109   123   143   122   109   97    122   145

```

Query 3 Results –

```

SELECT
    p.size as Pizza_size,
    SUM(quantity) as Number_of_pizzas,
    SUM(CAST(p.price as decimal(10,2))) as Revenue_per_size
FROM
    PizzaProject.order_details od
JOIN
    PizzaProject.pizzas p ON p.pizza_id = od.pizza_id
GROUP BY
    p.size
ORDER BY
CASE
    WHEN p.size = 'S' THEN 1
    WHEN p.size = 'M' THEN 2
    WHEN p.size = 'L' THEN 3
    WHEN p.size = 'XL' THEN 4
    WHEN p.size = 'XXL' THEN 5
END
;

```

Pizza_size	Number_of_pizz...	Revenue_per_size
S	14403	174794.50
M	15635	245409.50
L	18956	366862.10
XL	552	13872.00
XXL	28	1006.60

Query 4 Results –

```
SELECT
    pt.category as Pizza_category,
    SUM(od.quantity) AS Number_of_pizzas,
    SUM(CAST(p.price as decimal(10,2))) as Revenue_per_category
FROM
    PizzaProject.order_details od
JOIN
    PizzaProject.pizzas p ON p.pizza_id = od.pizza_id
JOIN
    PizzaProject.pizza_types pt ON pt.pizza_type_id = p.pizza_type_id
GROUP BY
    pt.category
ORDER BY
    Number_of_pizzas DESC
;
```

Pizza_category	Number_of_pizz...	Revenue_per_catego...
Classic	14888	215732.60
Supreme	11987	204486.75
Veggie	11649	190198.10
Chicken	11050	191527.25

Query 5 Results –

```
SELECT
    QUARTER(o.date) as Quarter_,
    CONCAT('$', ROUND(SUM(od.quantity * p.price),2)) as Quarter_Sales
FROM
    PizzaProject.order_details od
JOIN
    PizzaProject.pizzas p ON od.pizza_id = p.pizza_id
JOIN
    PizzaProject.orders o ON o.order_id = od.order_id
GROUP BY
    QUARTER(o.date)
;
```

Quarter_	Quarter_Sales
1	\$205350
2	\$208369.75
3	\$205016.2
4	\$199124.1

Query 6 Results –

```
with s as (
SELECT
    pt.name as name,
    p.price * SUM(od.quantity) as Total_revenue
FROM
    PizzaProject.order_details od
JOIN
    PizzaProject.pizzas p ON p.pizza_id = od.pizza_id
JOIN
    PizzaProject.pizza_types pt ON pt.pizza_type_id = p.pizza_type_id
GROUP BY
    pt.name,
    p.price
)
SELECT
    s.name as name,
    CONCAT('$', FORMAT(SUM(s.Total_revenue), 2)) as Total_revenue
FROM
    s
GROUP BY
    s.name
ORDER BY
    Total_revenue DESC
;
```

name	Total_revenue
The Thai Chicken Pizza	\$43,434.25
The Barbecue Chicken Pizza	\$42,768.00
The California Chicken Pizza	\$41,409.50
The Classic Deluxe Pizza	\$38,180.50
The Spicy Italian Pizza	\$34,831.25
The Southwest Chicken Pizza	\$34,705.75
The Italian Supreme Pizza	\$33,476.75
The Hawaiian Pizza	\$32,273.25
The Four Cheese Pizza	\$32,265.70
The Sicilian Pizza	\$30,940.50
The Pepperoni Pizza	\$30,161.75
The Greek Pizza	\$28,454.10
The Mexicana Pizza	\$26,780.75
The Five Cheese Pizza	\$26,066.50
The Pepper Salami Pizza	\$25,529.00
The Italian Capocollo Pizza	\$25,094.00
The Vegetables + Vegetable...	\$24,374.75
The Prosciutto and Arugula...	\$24,193.25
The Napolitana Pizza	\$24,087.00
The Spinach and Feta Pizza	\$23,271.25
The Big Meat Pizza	\$22,968.00
The Pepperoni, Mushroom,...	\$18,834.50
The Chicken Alfredo Pizza	\$16,900.25
The Chicken Pesto Pizza	\$16,701.75
The Soppressata Pizza	\$16,425.75
The Italian Vegetables Pizza	\$16,019.25
The Calabrese Pizza	\$15,934.25
The Spinach Pesto Pizza	\$15,596.00
The Mediterranean Pizza	\$15,360.50
The Spinach Supreme Pizza	\$15,277.75
The Green Garden Pizza	\$13,955.75
The Brie Carre Pizza	\$11,588.50

Query 7 Results –

```
SELECT
  CONCAT('$', FORMAT(AVG(order_revenue), 2)) AS Average_Revenue_Per_Order
FROM (
  SELECT
    o.order_id,
    SUM(od.quantity * p.price) AS order_revenue
  FROM
    PizzaProject.order_details od
  JOIN
    PizzaProject.pizzas p ON p.pizza_id = od.pizza_id
  JOIN
    PizzaProject.orders o ON o.order_id = od.order_id
  GROUP BY
    o.order_id
) AS order_revenues
;
```

Average_Revenue_Per_Order

\$38.31

Query 8 Results –

```
DROP TEMPORARY TABLE IF EXISTS pizza_ingredients;
CREATE TEMPORARY TABLE pizza_ingredients (
  id int AUTO_INCREMENT PRIMARY KEY,
  ingredients varchar(255)
);

INSERT INTO pizza_ingredients (ingredients)
SELECT DISTINCT SUBSTRING_INDEX(SUBSTRING_INDEX(pt.ingredients, ',', n), ',', -1) AS value
FROM PizzaProject.pizza_types pt
JOIN (
  SELECT 1 AS n UNION ALL
  SELECT 2 UNION ALL
  SELECT 3
) AS numbers ON CHAR_LENGTH(pt.ingredients)
  - CHAR_LENGTH(REPLACE(pt.ingredients, ',', '')) >= n - 1;

SELECT
  pi.ingredients,
  COUNT(DISTINCT pt.name) as Number_of_pizzas
FROM
  PizzaProject.pizza_ingredients pi,
  PizzaProject.pizza_types pt
WHERE
  pt.ingredients LIKE CONCAT('%', pi.ingredients, '%')
GROUP BY
  pi.ingredients
ORDER BY
  Number_of_pizzas DESC
;
```

ingredients	Number_of_pizz...
Tomatoes	19
Tomatoes	17
Red Onions	13
Red Peppers	10
Spinach	8
Mushrooms	7
Pepperoni	6
Mozzarella Cheese	6
Chicken	6
Mushrooms	6
Artichoke	6
Artichokes	5
Feta Cheese	4
Green Olives	4
Mozzarella Cheese	4
Capocollo	4
Pepperoni	4
Spinach	3
Green Peppers	3
Kalamata Olives	3
Jalapeno Peppers	3
Capocollo	2
Pineapple	2
Bacon	2
Kalamata Olives	2
Goat Cheese	2
Fontina Cheese	2
Prosciutto	1
Arugula	1
Smoked Gouda Cheese	1
Provolone Cheese	1
Aduja Salami	1
Barbecued Chicken	1
Brie Carre Cheese	1
Calabrese Salami	1
Pancetta	1
Coarse Sicilian Salami	1

Interpreting findings –

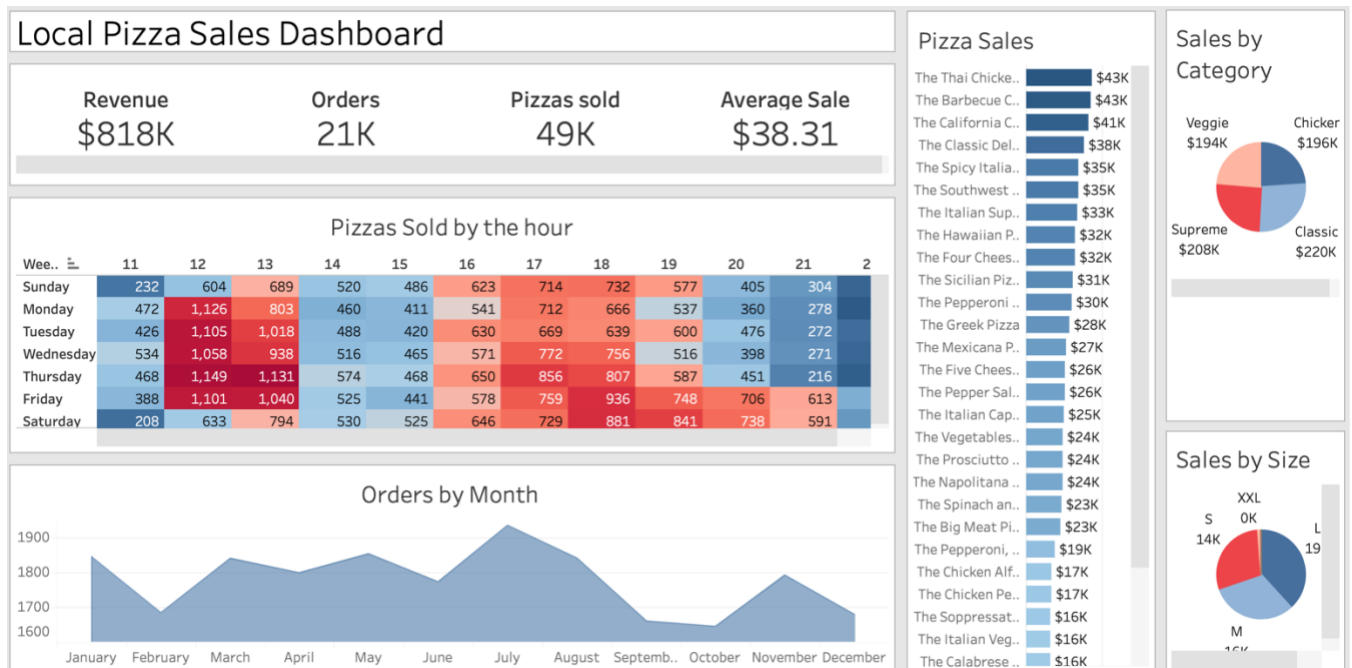
1. There appears to be a peak in orders and quantity sold during the months of June – July, Wednesday – Friday, and 12 -13 hour of the day.
2. The classic deluxe, Thai chicken, and the barbecue chicken appear to be the top 3 most consistent and highest selling pizzas on the menu.

3. The large size brings in the most revenue, but the medium size sells well compared to its quantities sold.
4. The classic pizza brings in the most revenue, while the other 3 categories are relatively close together.
5. Quarters 1-3 appear to be very close together, while quarter 4 is the lowest out of the 4.
6. The Thai chicken pizza is the highest selling pizza, while the Brie Carre pizza is the lowest selling pizza.
7. The average revenue per order is \$38.31.
8. Tomato, red onions, and red peppers, appear to be the top 3 most used ingredients in all the pizzas on the menu.

Step 5 – Share

In this step, we will create visualizations and present our findings based on our analysis using tableau.

Tableau Dashboard –



Findings –

In the year 2015, the local pizza store brought in \$818,000 in total revenue, 21,000 orders fulfilled, and 49,000 pizzas sold. Without knowing the costs of running the store, this local store is well over the average revenue of pizza stores in the U.S.

1. The most-busiest times according to the pizzas sold by the hour chart are 12pm, 1pm Monday – Friday, and 5pm, 6pm all week. These times are consistent throughout the year, as it is indicated by the dark red color (dark red – high count, dark blue – low count). Vice Versa, the least-busiest times are going to be the first hour of opening and last hour of closing. It is important to note that 2pm and 3pm are low compared to their busiest times of the day.
2. The number of orders fulfilled for the year have all been over 1,600 with February, September, and October being the lowest. Vice Versa, the months of March, May, and July have been the peak in terms of orders fulfilled. It is important to know that seasons and promotions may have a lot to do with the distribution and inconsistency of orders fulfilled for the year.
3. The top 5 pizzas make over bring in over \$35,000 of revenue, while the bottom 5 pizzas make under \$16,000. This is important to know when to put certain pizzas on promotion and where more resources are needed.
4. The classic pizzas are leading all other categories with a total of \$220,000 of revenue, while the veggie category is the lowest with a total of \$194,000 of revenue. This is mainly because veggie pizzas are the least attractive and among the 4 categories.
5. The most sizes sold is going to be large pizzas with small and medium pizzas following. This may be due to the customer preferences, pizza per price, and any promotions that are available at the time. The XL and XXL sizes have very little demand as that is not an ideal purchase for the average customer.

Step 6 – Act

In this final step we will be presenting our findings and provide recommendations based on our analysis.

Here, we will revisit our business questions and share our data driven business recommendations.

Recommendations -

- The busiest hours are 12pm, 1pm Monday – Friday, and 5pm, 6pm all week. The busiest months are March, May, and July. Knowing this information, it is best to make sure you are properly staffed during the busiest months and hours. Vice versa, the least-busiest hours should not be fully staffed to account for the low volume of orders. This is attempts to fully maximize your resources and revenue that can potentially be earned.
- The lowest selling sizes being XL and XXL, it is recommended to consider taking those sizes out in attempts to save resources and lower the cost of producing those pizzas. Another solution may be to have them on a big promotion, especially during the holidays or big events that require the gathering of people.
- Now that you know your bestselling and worst selling pizzas, it is recommended to leverage this to your advantage. You may consider having deals and coupons over the weekend for pizzas that you know there is demand.
- Another recommendation to consider is taking the lowest selling pizzas out of the menu. It will save a ton of resource and allow for new pizzas to be introduced. If this is implemented, it is recommended to make a new pizza is the classic, chicken, or supreme category since they are the top 3 best selling categories.