Amazon Sales Insight Project

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Project Overview

The primary aim of this project is to analyse sales data from three Amazon branches located in Mandalay, Yangon, and Naypyitaw. This analysis will uncover insights into product performance, sales trends, and customer behaviour. The dataset comprises 1000 rows and 17 columns, including information such as invoice details, product lines, prices, quantities, taxes, dates, and customer demographics. The goal is to leverage this data to improve sales strategies, enhance product offerings, and better understand customer segments.

Project Scope

1. Data Wrangling:
• Inspect and clean the data, ensuring no null values.
• Build a database, create tables, and insert the cleaned data.

2. Feature Engineering:
• Create new columns for time of day, day of the week, and month of the year to gain insights into sales patterns.

3. Exploratory Data Analysis (EDA):
• Analyze product performance to identify best and worst-performing product lines.
• Examine sales trends to evaluate the effectiveness of sales strategies.
• Segment customers to uncover purchase trends and profitability by customer type.

4. Business Questions:
• Address specific business questions related to product lines, payment methods, revenue, VAT, customer types, and ratings.

Business Problem

Amazon needs to understand various factors influencing sales across its different branches to optimize its business strategies. Key challenges include identifying high-performing product lines, understanding sales trends over time, and segmenting customers based on purchasing behaviour. Addressing these challenges will help Amazon refine its product offerings, tailor marketing strategies, and ultimately increase revenue.

Business Objective

- **Product Analysis:** Evaluate the performance of different product lines to identify top-performing products and those needing improvement.
- **Sales Analysis:** Examine sales trends to measure the effectiveness of sales strategies and identify areas for improvement.
- **Customer Analysis:** Analysis to uncover the different customer segments, purchase trends and the profitability of each customer segment.

Technical Stacks

Data Understanding

- **Data Source File Type:** Microsoft Excel Comma Separated Values File (.csv)

- **Data Dictionary:** invoice_id, branch, city, customer_type, gender, product_line, unit_price, quantity, vat, total, purchase_date, purchase_time, payment_method, cogs, gross_margin_percentage, gross_income, rating, time_of_day, name_of_day, name_of_month

- **Data Dimesion:** 20 columns and 1000 rows

Data Dictionary

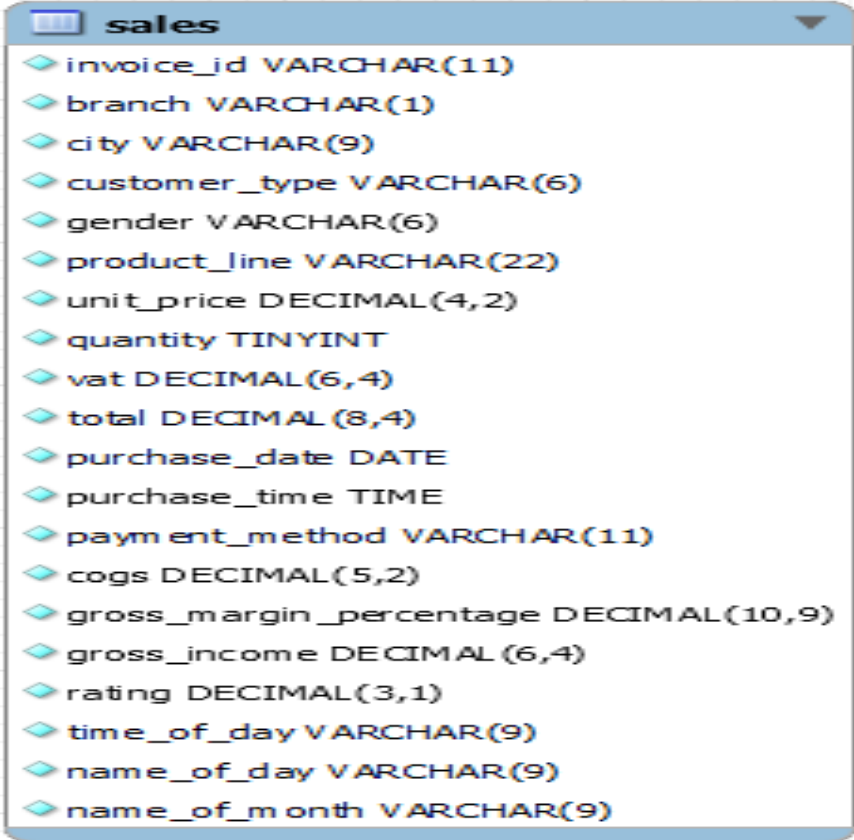| Column name	Description
invoice_id	Invoice of the sales made
branch	Branch at which sales were made
city	The location of the branch
customer_type	The type of the customer
gender	Gender of the customer making purchase
product_line	Product line of the product sold
unit_price	The price of each product
quantity	The amount of the product sold
vat	The amount of tax on the purchase
total	The total cost of the purchase

Data Dictionary

Column name	Description
purchase_date	The date on which the purchase was made
purchase_time	The time at which the purchase was made
payment_method	The type of payment method used for purchase
cogs	Cost Of Goods sold
gross_margin_percentage	Gross margin percentage
gross_income	Gross Income
rating	Rating given to the product
time_of_day	Time of day at which the purchase was made
name_of_day	Name of month on which the purchase was made
name_of_month	Name of the day at which the purchase was made

Data Dictionary

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Invoice ID	Branch	City	Customer	Gender	Product li	Unit price	Quantity	Tax 5%	Total	Date	Time	Payment	cogs	gross mar;	gross inco	Rating
2	750-67-84:	A	Yangon	Member	Female	Health an	74.69	7	26.1415	548.9715	########	13:08:00	Ewallet	522.83	4.761905	26.1415	9.1
3	226-31-30:	C	Naypyitav	Normal	Female	Electronic	15.28	5	3.82	80.22	########	10:29:00	Cash	76.4	4.761905	3.82	9.6
4	631-41-31(	A	Yangon	Normal	Male	Home and	46.33	7	16.2155	340.5255	########	13:23:00	Credit car	324.31	4.761905	16.2155	7.4
5	123-19-11'	A	Yangon	Member	Male	Health an	58.22	8	23.288	489.048	########	20:33:00	Ewallet	465.76	4.761905	23.288	8.4
6	373-73-79:	A	Yangon	Normal	Male	Sports and	86.31	7	30.2085	634.3785	########	10:37:00	Ewallet	604.17	4.761905	30.2085	5.3
7	699-14-30:	C	Naypyitav	Normal	Male	Electronic	85.39	7	29.8865	627.6165	########	18:30:00	Ewallet	597.73	4.761905	29.8865	4.1
8	355-53-59	A	Yangon	Member	Female	Electronic	68.84	6	20.652	433.692	########	14:36:00	Ewallet	413.04	4.761905	20.652	5.8
9	315-22-56(	C	Naypyitav	Normal	Female	Home and	73.56	10	36.78	772.38	########	11:38:00	Ewallet	735.6	4.761905	36.78	8
10	665-32-91(	A	Yangon	Member	Female	Health an	36.26	2	3.626	76.146	########	17:15:00	Credit car	72.52	4.761905	3.626	7.2
11	692-92-55:	B	Mandalay	Member	Female	Food and	54.84	3	8.226	172.746	########	13:27:00	Credit car	164.52	4.761905	8.226	5.9
12	351-62-08:	B	Mandalay	Member	Female	Fashion ac	14.48	4	2.896	60.816	########	18:07:00	Ewallet	57.92	4.761905	2.896	4.5
13	529-56-39	B	Mandalay	Member	Male	Electronic	25.51	4	5.102	107.142	########	17:03:00	Cash	102.04	4.761905	5.102	6.8
14	365-64-05:	A	Yangon	Normal	Female	Electronic	46.95	5	11.7375	246.4875	########	10:25:00	Ewallet	234.75	4.761905	11.7375	7.1
15	252-56-26:	A	Yangon	Normal	Male	Food and	43.19	10	21.595	453.495	########	16:48:00	Ewallet	431.9	4.761905	21.595	8.2
16	829-34-39:	A	Yangon	Normal	Female	Health an	71.38	10	35.69	749.49	########	19:21:00	Cash	713.8	4.761905	35.69	5.7
17	299-46-18(	B	Mandalay	Member	Female	Sports and	93.72	6	28.116	590.436	########	16:19:00	Cash	562.32	4.761905	28.116	4.5
18	656-95-93	A	Yangon	Member	Female	Health an	68.93	7	24.1255	506.6355	########	11:03:00	Credit car	482.51	4.761905	24.1255	4.6
19	765-26-69:	A	Yangon	Normal	Male	Sports and	72.61	6	21.783	457.443	########	10:39:00	Credit car	435.66	4.761905	21.783	6.9
20	329-62-15:	A	Yangon	Normal	Male	Food and	54.67	3	8.2005	172.2105	########	18:00:00	Credit car	164.01	4.761905	8.2005	8.6
21	319-50-33	B	Mandalay	Normal	Female	Home and	40.3	2	4.03	84.63	########	15:30:00	Ewallet	80.6	4.761905	4.03	4.4
22	300-71-46(	C	Naypyitav	Member	Male	Electronic	86.04	5	21.51	451.71	########	11:24:00	Ewallet	430.2	4.761905	21.51	4.8
23	371 85 57:	B	Mandalay	Normal	Male	Health an	87.98	3	13.197	277.137	########	10:40:00	Ewallet	263.94	4.761905	13.197	5.1

Source_File

Entity – Relationship Diagram

Insights drawn and Recommendations (Product)

Food and beverages: The top-performing product line is Food and Beverages, evidenced by its highest revenue generation, highest rating, and being the second most sold product line.

Recommendation: To sustain this success, it's crucial to maintain ample stock levels to promptly meet customer demand, ensuring their satisfaction and fostering loyalty.

Health and beauty: The product line that requires the most improvement is the Health and Beauty product line. This conclusion is based on its least revenue generation, lowest number of products sold, and average rating.

Recommendation: To enhance Health and Beauty sales, we can gather customer feedback to understand preferences and introduce innovative products aligned with market trends.

Home and lifestyle: After Health and Beauty, the Home and Lifestyle product line warrants improvement due to its second-lowest revenue generation and sales quantity, along with the lowest ratings.

Recommendation: We can gather feedback from customers to continuously refine and improve the product offerings and overall shopping experience.

Sports and travel: Despite being the second-highest revenue-generating product line, its the third least sold product line and has the second-lowest rating.

Recommendation: We can analyze customer feedback, improve marketing strategies, and consider introducing new products.

Electronic accessories and Fashion accessories: For both product lines, the performance is average.

Recommendation: Utilize customer insights to refine product offerings and implement targeted marketing strategies to maximize performance.

Insights drawn and Recommendations (Sales)

Electronic accessories - January

Fashion accessories – January

Food and beverages – February

Health and beauty – March

Home and lifestyle – March

Sports and travel – January

Recommendation: Consider introducing new products or enhancing existing ones to meet customer demand during these periods. Implement targeted marketing strategies and special promotions to stimulate sales during off-peak months.

Electronic accessories - Thursday

Fashion accessories – Saturday

Food and beverages – Wednesday

Health and beauty - Tuesday

Home and lifestyle - Sunday

Sports and travel – Friday

Recommendation: Implementing targeted marketing campaigns and promotions on specific days corresponding to each product category's highest revenue can potentially boost sales and capitalize on peak purchasing patterns.

The highest revenue across all product lines is consistently generated during the afternoon, reflecting peak sales activity during this time .

Recommendation: Optimizing product displays and offering special deals during off- peak hours can attract customers and boost sales.

The most sold product line is Electronic accessories, while the least sold product line is Health and beauty.

Recommendation: To increase sales, consider offering promotions or discounts on Health and beauty products to boost their sales. Additionally, enhancing the marketing and visibility of Health and beauty items could attract more customers and drive sales.

Insights drawn and Recommendations (Customer)

Half of the customers are male, and the other half are female, with a slightly higher proportion of females.

Recommendation: Tailor marketing efforts to align with the distinct preferences and purchasing patterns of male and female customers.

Ewallet is the most frequently used mode of payment, followed closely by cash, with credit card being the least utilized.

Recommendation: Implement exclusive offers for Ewallet transactions to boost sales.

Highest revenue was generated from Naypyitaw and lowest by Mandalay.

Recommendation: To increase sales in cities generating less revenue, we can collaborate with local businesses for cross-promotions, offer exclusive discounts or incentives to encourage purchases.

Highest revenue was generated from Branch C, while the lowest was generated by Branch B.

Recommendation: To increase sales in branches generating less revenue, we can provide staff training to enhance customer service and product knowledge.

Half of the customers fall under the Normal category, while the other half are Members, with a slightly higher proportion being members.

Recommendation: Launch new offers/discounts with subscriptions.