

Sales Data Analysis Report Using SQL Server

Executive Summary:

We exported the e-commerce sales data using SQL Server Management Studio (SSMS) after importing it from a CSV file available on Kaggle. We conducted several analyses to gain deeper insights into the store's sales operations and explored ways to improve services based on a defined scope.

Scope:

Analysis Objectives:

- Customer behavior analysis.
- Sales performance analysis.
- Temporal performance analysis.
- Product performance analysis.

Data Specifications:

- **Source:** CSV file from Kaggle.
- **Time Frame:** December 1, 2010 to June 6, 2011.
- **Size:** 541,910 records – 8 columns.
- **Fields:** InvoiceNo, StockCode, Description, Quantity, InvoiceDate, UnitPrice, CustomerID, Country.

Customer Analysis:

Who are the top spending customers?

	CustomerID	TotalSpent
1	17857	1033113.60
2	18102	486243.79
3	14646	370006.06
4	17450	261688.86
5	14607	251184.08
6	12415	216923.46
7	14911	196157.03
8	14156	189586.94
9	17511	149645.06
10	16684	126699.59

- Total spending per customer was calculated by multiplying the quantity of items by the unit price.
- **Top spender:** Customer ID **17857**.

Recommendations:

- Launch targeted marketing campaigns for high-spending customers to boost loyalty.
- Offer loyalty programs or discounts to top-tier customers.

What is the average number of orders per customer?

	AvgOrdersPerCustomer
1	5

- The number of orders per customer was calculated, and the average was derived.
- **Average:** Around **5 orders per customer**.

Recommendations:

- Encourage low-activity customers to make repeat purchases using promotions.
- Investigate the reasons behind fewer orders (e.g., user experience issues or lack of recurring demand).

Sales Analysis:

What is the monthly revenue?

	month	Revenue
1	2010-12	843177.54
2	2011-01	711056.03
3	2011-02	625306.04
4	2011-03	807440.33
5	2011-04	654790.57
6	2011-05	684790.98
7	2011-06	954339.52
8	2011-07	927358.70
9	2011-08	814555.15
10	2011-09	1477199.48
11	2011-10	1586729.67
12	2011-11	2477455.65
13	2011-12	680428.35

- Revenue was aggregated monthly by multiplying quantity by unit price.
- **Insight:** There is seasonal growth in certain months, indicating recurring peak purchasing periods.

Recommendations:

- Launch proactive marketing campaigns before high-demand seasons.
- Manage inventory strategically according to seasonal demand patterns.

Time-Based Performance Analysis:

When are the peak ordering hours?

	HourOfDay	OrderCount
1	12	3597
2	13	3043
3	11	2769
4	14	2645
5	10	2613
6	15	2405
7	9	1622
8	16	1491
9	17	842
10	8	608
11	18	257
12	19	217
13	7	31
14	20	28
15	6	22

- Orders were analyzed by hour.
- **Peak hours:** Between 11 AM and 3 PM.

Recommendations:

- Increase customer service and support during peak hours.
- Schedule ad campaigns during high-traffic hours for maximum effectiveness.

Product Analysis:

Which products are top sellers by quantity?

	StockCode	Description	TotalQuantitySold
1	84077	WORLD WAR 2 GLIDERS ASSTD DESIGNS	53215
2	22197	POPCORN HOLDER	48712
3	85099B	JUMBO BAG RED RETROSPOT	45066
4	84879	ASSORTED COLOUR BIRD ORNAMENT	35314
5	85123A	CREAM HANGING HEART T-LIGHT HOLDER	34204
6	21212	PACK OF 72 RETROSPOT CAKE CASES	33409
7	23084	RABBIT NIGHT LIGHT	27094
8	22492	MINI PAINT SET VINTAGE	25880
9	22616	PACK OF 12 LONDON TISSUES	25321
10	21977	PACK OF 60 PINK PAISLEY CAKE CASES	24163

- Products were ranked based on total quantity sold.
- **Observation:** Some products have high sales volume despite low prices.

Which products generate the most revenue?

	stockcode	description	TotalRevenue
1	M	Manual	715412.96
2	22423	REGENCY CAKESTAND 3 TIER	288412.80
3	85099B	JUMBO BAG RED RETROSPOT	186122.58
4	47566	PARTY BUNTING	162141.33
5	85123A	CREAM HANGING HEART T-LIGHT HOLDER	100901.80
6	82484	WOOD BLACK BOARD ANT WHITE FINISH	98067.11
7	23284	DOORMAT KEEP CALM AND COME IN	80797.43
8	22720	SET OF 3 CAKE TINS PANTRY DESIGN	74062.56
9	21212	PACK OF 72 RETROSPOT CAKE CASES	69490.72
10	85099F	JUMBO BAG STRAWBERRY	68380.41

- Products were ranked based on revenue (quantity \times unit price).
- **Observation:** Some products with moderate demand and high unit price contribute significantly to revenue.

Recommendations:

- Promote high-revenue products more aggressively.
- Monitor performance of high-volume products with low revenue margins.

Which products are stagnant (not ordered recently)?

	stockcode	description	LastOrderDate
1	84854	NULL	2010-12-01 09:41:00.000
2	21895	NULL	2010-12-01 12:31:00.000
3	20957	PORCELAIN HANGING BELL SMALL	2010-12-01 14:33:00.000
4	82615	PINK MARSHMALLOW SCARF KNITTING KIT	2010-12-01 16:11:00.000
5	21488	RED WHITE SCARF HOT WATER BOTTLE	2010-12-01 16:58:00.000
6	35271S	NULL	2010-12-02 13:49:00.000
7	21268	VINTAGE BLUE TINSEL REEL	2010-12-02 15:46:00.000
8	22275	WEEKEND BAG VINTAGE ROSE PAISLEY	2010-12-02 16:51:00.000
9	16161M	WRAP PINK FLOCK	2010-12-02 18:15:00.000
10	47503J	SET/3 FLORAL GARDEN TOOLS IN BAG	2010-12-03 12:24:00.000
11	90152B	BLUE/GREEN SHELL NECKLACE W PENDANT	2010-12-03 14:54:00.000
12	90128B	BLUE LEAVES AND BEADS PHONE CHARM	2010-12-03 14:54:00.000
13	84614A	thrown away	2010-12-03 15:45:00.000
14	90167	NULL	2010-12-05 11:10:00.000
15	84963A	PINK PAINTED KASHMIRI CHAIR	2010-12-05 11:57:00.000
16	21486	NULL	2010-12-05 12:13:00.000
17	47579	NULL	2010-12-05 13:00:00.000

- Products that haven't been ordered in the last 6 months were identified.

Recommendations:

- Reevaluate pricing for stagnant products.
- Consider removing underperforming items from the catalog.
- Analyze potential causes for low demand (quality, marketing, competition).

What is the top-selling product each month?

month	StockCode	description	TotalSold	ProductRank
2011-01	21324	NULL	26	1236
2011-01	85040B	NULL	26	1236
2011-01	22550	HOLIDAY FUN LUDO	26	1236
2011-01	79191B	RETRO PLASTIC POLKA TRAY	25	1249
2011-01	47594B	SCOTTIES DESIGN WASHBAG	25	1249
2010-12	22877	NUMBER TILE COTTAGE GARDEN 9	5	1932
2010-12	90196A	PURPLE GEMSTONE NECKLACE 45CM	5	1932
2010-12	90003D	CRYSTAL PAIR HEART HAIR SLIDES	5	1932
2010-12	21538	NULL	5	1932
2010-12	22598	CHRISTMAS MUSICAL ZINC TREE	5	1932
2010-12	47574A	check	5	1932
2010-12	84531B	returned	5	1932
2010-12	90198A	VINTAGE ROSE BEAD BRACELET RASPB...	5	1932
2010-12	85017C	adjustment	5	1932

- The highest-selling product (by quantity) for each month was identified.

Recommendations:

- Use this data to tailor seasonal promotions.
- Predict future demand based on historical trends.

Conclusions and General Recommendations:

- Purchasing behavior follows seasonal and hourly patterns that can be leveraged for strategic marketing.
- Top spenders present a valuable opportunity for retention and relationship-building.
- Work on improving purchase frequency among less active customers.
- Underperforming products should be enhanced or removed based on performance data.