

**INDIAN INSTITUTE OF TECHNOLOGY
(IIT) MADRAS**

**BACHELOR OF SCIENCE (BSc)
IN
PROGRAMMING & DATA SCIENCE**

**BUSINESS DATA MANAGEMENT
(BDM) CAPSTONE PROJECT**

MID TERM SUBMISSION

SUBMITTED BY

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TITLE

Solving Cosmetics Wholesale Business Problems Using Data Analytics

EXECUTIVE SUMMARY

The company mentioned here falls under the B2B (business-to-business) category. It's a small wholesale cosmetics business with one owner and two employees that started operations six months ago. This type of business faces many challenges, including losses due to expired products in stock; finding retailers to work with; earning the trust of their traders, etc. When the business is in its infancy, it is also a struggle to learn about the market and how things work. These problems make it difficult for a new business to position itself in the market and grow. New businesses get stuck between what to do and what not to do.

Data analytics is currently the best way to guide these startups and help them grow. The data generated by these companies can help them respond to the changing needs and preferences of their customers. It will also help to learn about changes in market trends and trading trends. The solution created after analysing the data can give comprehensive advice on what to buy and what not to buy and in what quantities. It can also give detailed recommendations to businesses on what to stop doing, what to start doing, and what to keep doing.

PROBLEM OBJECTIVES

- ❖ **To find ways to get rid of the loss caused by expired products in stock.**
- ❖ **To find the steps to be taken, in that fixed capital, to increase profit and grow the business.**

DATA COLLECTED

To find the above-stated problem objectives, I need to have complete data on the purchase and sales of all products, including their quantities, discount, tax, etc.

So, I **collected purchase and sales invoices from the previous months** to get all these details in one place. I got xerox copy of purchase invoice & PDF copy of sales invoice.

PROOF OF ORIGINALITY OF THE DATA

Purchase Invoice

| Distributor Company Name | | Original Copy | | | | | | | |
|---|---------------------------------------|---------------|---------|----------|----------|---|------|-------|----------|
| QR Code | Address | | | | | | | | |
| E-Mail : | Phone : | Yr | | | | | | | |
| GST INVOICE | | | | | | | | | |
| GST NO. : | | | | | | | | | |
| Blush Rush | | Invoice No. : | | | | | | | |
| VARANASI 06/UTTAR PRADESH | | Date : | | | | | | | |
| PIN NO. : | | Eway No. | | | | | | | |
| PANADHAR No. : | | Cases | | | | | | | |
| GSTIN : | | Transport | | | | | | | |
| | | Due Date : | | | | | | | |
| NO. | PRODUCT | HSN | QTY | UNIT | M.R.P | RATE | DISC | GST | AMOUNT |
| 1 | MANCARRA(350) PCS | 3304 | 24 | PCS | 350.00 | 215.74 | 0.00 | 18.00 | 5177.76 |
| 2 | MAKEUP FIXER 80ML | 3304 | 48 | PCS | 399.00 | 245.94 | 0.00 | 18.00 | 11805.12 |
| 3 | ULTRA VISHADKRW WET N DRY (1499) PCS | 3304 | 10 | PCS | 1499.00 | 923.98 | 0.00 | 18.00 | 9239.80 |
| 4 | TESTER PCS | 3304 | ++1 | PCS | 0.00 | 0.00 | 0.00 | 18.00 | 0.00 |
| 5 | PRE MAKE UP BASE (549) NEW | 3304 | 12 | PCS | 845.00 | 335.40 | 0.00 | 18.00 | 4060.80 |
| 6 | PRE MAKE UP BASE GOLD(790) PCS | 3304 | 24 | PCS | 750.00 | 482.50 | 0.00 | 18.00 | 11095.20 |
| 7 | COMPACT POWDER (350) CP-02 PCS | 3304 | ++24 | PCS | 250.00 | 154.50 | 0.00 | 18.00 | 0.00 |
| 8 | PREMIUM PRIMER GEL 30ML | 3304 | 18 | PCS | 850.00 | 523.34 | 0.00 | 18.00 | 9430.92 |
| 9 | KARAL PENCIL PCS | 3304 | 36 | PCS | 145.00 | 88.38 | 0.00 | 18.00 | 3217.68 |
| 10 | SUPREME EYELINER(LT-01) (150) PCS | 3304 | 36 | PCS | 180.00 | 82.46 | 0.00 | 18.00 | 3328.56 |
| 11 | HD EYE DEFINER(350) PCS | 3304 | 24 | PCS | 380.00 | 215.74 | 0.00 | 18.00 | 5177.76 |
| 12 | LINER CORRECTOR EMB (650) PCS | 3304 | 24 | PCS | 650.00 | 400.66 | 0.00 | 18.00 | 9615.84 |
| 13 | LINER CORRECTOR FOR MEDIUM (650) PCS | 3304 | 12 | PCS | 650.00 | 400.66 | 0.00 | 18.00 | 4807.92 |
| 14 | FACE POWDER FP-01 (F) PCS | 3304 | ++36 | PCS | 480.00 | 0.00 | 0.00 | 18.00 | 0.00 |
| 15 | FP-02 MEDIUM MERGE 30ML | 3304 | 18 | PCS | 295.00 | 184.30 | 0.00 | 18.00 | 3317.40 |
| 16 | GMP-01 (475) PCS | 3304 | 12 | PCS | 475.00 | 292.79 | 0.00 | 18.00 | 3513.48 |
| 17 | GMP-02 (475) PCS | 3304 | 24 | PCS | 475.00 | 292.79 | 0.00 | 18.00 | 7026.96 |
| 18 | GMP-03 (475) PCS | 3304 | 12 | PCS | 475.00 | 292.79 | 0.00 | 18.00 | 3513.48 |
| 19 | GMP-05 (475) PCS | 3304 | 12 | PCS | 475.00 | 292.79 | 0.00 | 18.00 | 3513.48 |
| 20 | SUPREME EYELINER(LT-01) (F) PCS | 3304 | ++60 | PCS | 0.00 | 0.00 | 0.00 | 18.00 | 0.00 |
| 21 | FACE POWDER(FP-05)(450) PCS | 3304 | 18 | PCS | 450.00 | 277.38 | 0.00 | 18.00 | 4992.84 |
| 22 | FACE POWDER(FP-02)(450) PCS | 3304 | 12 | PCS | 450.00 | 277.38 | 0.00 | 18.00 | 3328.56 |
| 23 | INSTAGRAM BB CREAM GRAPE(299) 40GM | 3304 | 24 | PCS | 299.00 | 184.30 | 0.00 | 18.00 | 4423.20 |
| 24 | INSTAGRAM BB CREAM PAPAYA(299) 40GM | 3304 | 12 | PCS | 299.00 | 184.30 | 0.00 | 18.00 | 2211.60 |
| 25 | LIT-04 GLOW RED RML | 3304 | 24 | PCS | 450.00 | 277.38 | 0.00 | 18.00 | 6657.12 |
| 26 | SHIMMER HIGHLIGHTER GOLDEN (SS-2) 3GM | 3304 | 3 | PCS | 450.00 | 277.38 | 0.00 | 18.00 | 832.14 |
| 27 | SHIMMER HIGHLIGHTER COPPER (SS-3) 3GM | 3304 | 3 | PCS | 450.00 | 277.38 | 0.00 | 18.00 | 832.14 |
| 28 | VME-02 (399) PCS | 3304 | 12 | PCS | 399.00 | 245.94 | 0.00 | 18.00 | 2951.28 |
| 29 | VME-03 (399) PCS | 3304 | 12 | PCS | 399.00 | 245.94 | 0.00 | 18.00 | 2951.28 |
| 30 | VME-14 (399) PCS | 3304 | 12 | PCS | 399.00 | 245.94 | 0.00 | 18.00 | 2951.28 |
| 31 | ETHEL SCK(400) PCS | 3304 | 12 | PCS | 400.00 | 245.94 | 0.00 | 18.00 | 2951.28 |
| 32 | TIKKA BLUSH(LT-02)(299) ML PCS | 3304 | 6 | PCS | 798.00 | 482.50 | 0.00 | 18.00 | 2955.00 |
| Total Qty :- 617 | | | | | | | | | |
| CLASS | TOTAL | SCH | DISC | SCHT | CGST | TOTAL GST | | | |
| GST 5% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| GST 12% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| GST 18% | 13987.32 | 0.00 | 8073.68 | 11503.22 | 11503.22 | 23006.44 | | | |
| GST 28% | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| TOTAL | 13987.32 | 0.00 | 8073.68 | 11503.22 | 11503.22 | 23006.44 | | | |
| Terms & Conditions All disputes subject to BANK DETAIL :- A/C NO. :- 316802 BANK DETAIL :- A/C NO. :- 50200 Interest @24% p.a will be charged if the payment is not made within 30 days. | | | | | | | | | |
| | | | | | | Signature कोरियर से प्राप्त करते समय 1- डेटा बॉक्स होने पर बॉक्स गिनीय न हो 2- डेटा फटी होने पर या बॉक्स निकलने पर कोरियर वाले के सामने फिल्ट में कम सामान की डिप्लोमा धारक दिखाने | | | |

Sales Invoice

BLUSH RUSH

Original for Buyer

QR Code

Address: VARANASI
09-UTTAR PRADESH

Phone : XXXXXXXXXXXX, XXXXXXXXXXXX
E-Mail : xxxxxxxxxxxxxxxxxx@gmail.com

GST INVOICE

[illegible]

Retailer's Name

Address

VARANASI 09-UTTAR PRADESH

UTTAR PRADESH 221002

PH.NO.: XXXXXXXXXX

PAN/ADHAR No. : XXXXXXXXXX

GSTIN : XXXXXXXXXXXXXXXX

Invoice No. : **XXXXXXXX**

Date : XX/XX/XXXX

Eway No. :

Way No. :
Cases : 0

Cases :
Transport :

Transport :
M.P. Name :

| NO. | QTY. | PAC K | PRODUCT | HS N | M.R.P | RATE | SCH. | AMOU. | SGST | CGST | NET AMO. |
|-----|------|-------|-----------------------------|------|---------|---------|-------|---------|------|------|----------|
| 1. | 3 | PCS | MAKEUP FX | 3304 | 399.00 | 399.00 | 32.20 | 1197.00 | 9.00 | 9.00 | 957.65 |
| 2. | 6 | PCS | HP MATT PENCIL-06 | 3304 | 450.00 | 450.00 | 32.20 | 2700.00 | 9.00 | 9.00 | 2160.10 |
| 3. | 3 | | PRE MAKEUP BASE | 3304 | 600.00 | 549.00 | 32.20 | 1647.00 | 9.00 | 9.00 | 1317.67 |
| 4. | 3 | PCS | BB GRAPE | 3304 | 250.00 | 250.00 | 32.20 | 750.00 | 9.00 | 9.00 | 600.04 |
| 5. | 3 | PCS | VML-13 | 3304 | 350.00 | 350.00 | 32.20 | 1050.00 | 9.00 | 9.00 | 840.04 |
| 6. | 2 | PCS | VML-05 | 3304 | 350.00 | 399.00 | 32.20 | 798.00 | 9.00 | 9.00 | 638.42 |
| 7. | 2 | PCS | VML-02 | 3304 | 350.00 | 399.00 | 32.20 | 798.00 | 9.00 | 9.00 | 638.42 |
| 8. | 5+1 | PCS | VML-15 | 3304 | 399.00 | 399.00 | 32.20 | 1995.00 | 9.00 | 9.00 | 1596.07 |
| 9. | 5+1 | PCS | VML-16 | 3304 | 399.00 | 399.00 | 32.20 | 1995.00 | 9.00 | 9.00 | 1596.07 |
| 10. | 5+1 | PCS | VML-17 | 3304 | 399.00 | 399.00 | 32.20 | 1995.00 | 9.00 | 9.00 | 1596.07 |
| 11. | 5+1 | PCS | VML-18 | 3304 | 399.00 | 399.00 | 32.20 | 1995.00 | 9.00 | 9.00 | 1596.07 |
| 12. | 5+1 | PCS | VML-19 | 3304 | 399.00 | 399.00 | 32.20 | 1995.00 | 9.00 | 9.00 | 1596.07 |
| 13. | 5+1 | PCS | VML-20 | 3304 | 399.00 | 399.00 | 32.20 | 1995.00 | 9.00 | 9.00 | 1596.07 |
| 14. | 3 | 1N | ROSEATE OMK-03 | 3304 | 750.00 | 750.00 | 32.20 | 2250.00 | 9.00 | 9.00 | 1800.10 |
| 15. | 3 | 1N | ROSEATE OMK-05 | 3304 | 750.00 | 750.00 | 32.20 | 2250.00 | 9.00 | 9.00 | 1800.10 |
| 16. | 3 | 1N | ROSEATE OMK-06 | 3304 | 750.00 | 750.00 | 32.20 | 2250.00 | 9.00 | 9.00 | 1800.10 |
| 17. | 4+1 | 6ML | ROSEATE OMK-07 | 3304 | 750.00 | 750.00 | 32.20 | 3000.00 | 9.00 | 9.00 | 2400.12 |
| 18. | 3+1 | 1N | ULTRA WET N DRY EYE SHADOW | 3304 | 2100.00 | 1499.00 | 32.20 | 4497.00 | 9.00 | 9.00 | 3597.79 |
| 19. | 6 | PCS | GMP-2 | 3304 | 475.00 | 475.00 | 32.20 | 2850.00 | 9.00 | 9.00 | 2280.12 |
| 20. | 2 | PCS | GMP-1 | 3304 | 475.00 | 475.00 | 32.20 | 950.00 | 9.00 | 9.00 | 760.04 |
| 21. | 2 | PCS | COMPACT POWDER [250] CP-01 | 3304 | 250.00 | 299.00 | 32.20 | 598.00 | 9.00 | 9.00 | 478.42 |
| 22. | 3 | PCS | COMPACT POWDER [250] CP-02 | 3304 | 250.00 | 250.00 | 32.20 | 750.00 | 9.00 | 9.00 | 600.04 |
| 23. | 2 | PCS | COMPACT POWDER [225] CP-04 | 3304 | 250.00 | 250.00 | 32.20 | 500.00 | 9.00 | 9.00 | 400.02 |
| 24. | 4 | 10GM | 3 IN 1 CORRECTOR FAIR | 3304 | 599.00 | 650.00 | 32.20 | 2600.00 | 9.00 | 9.00 | 2080.10 |
| 25. | 4 | 10GM | 3 IN 1 CORRECTOR MEDIUM | 3304 | 599.00 | 650.00 | 32.20 | 2600.00 | 9.00 | 9.00 | 2080.10 |
| 26. | 6 | PSC | HD KOHL PENCIL HD EYE DEFIN | 3304 | 350.00 | 350.00 | 32.20 | 2100.00 | 9.00 | 9.00 | 1680.08 |
| 27. | 4+1 | PCS | XFH-02 | 3304 | 500.00 | 500.00 | 32.20 | 2000.00 | 9.00 | 9.00 | 1600.08 |
| 28. | 4+1 | PCS | XFH-03 | 3304 | 500.00 | 500.00 | 32.20 | 2000.00 | 9.00 | 9.00 | 1600.08 |
| 29. | 4+1 | PCS | XFH-04 | 3304 | 500.00 | 500.00 | 32.20 | 2000.00 | 9.00 | 9.00 | 1600.08 |
| 30. | 3 | PCS | H-01 | 3304 | 250.00 | 250.00 | 32.20 | 750.00 | 9.00 | 9.00 | 600.04 |
| 31. | 2 | PCS | LLC-04 | 3304 | 400.00 | 450.00 | 32.20 | 900.00 | 9.00 | 9.00 | 720.04 |
| 32. | 1 | PCS | LLC-03 | 3304 | 400.00 | 400.00 | 32.20 | 400.00 | 9.00 | 9.00 | 320.02 |

| | | | | | | | | | |
|------------------|----------|------|----------|---------|---------|---------|-------------|--|----------|
| Total Qty :- 126 | | | | | | | | | |
| CLASS | TOTAL | SCH. | DISC. | SGST | CGST | TOTAL | SUB TOTAL | | 56155.00 |
| GST | | | | | | | DISCOUNT | | 18081.91 |
| GST 5 % | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | SGST PAYBLE | | 3426.57 |
| GST 12 % | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | CGST PAYBLE | | 3426.57 |
| GST 18 % | 56155.00 | 0.00 | 18081.91 | 3426.57 | 3426.57 | 6853.14 | ROUND OFF | | 0.38 |
| GST 28 % | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| TOTAL | 56155.00 | 0.00 | 18081.91 | 3426.57 | 3426.57 | 6853.14 | GRAND TOTAL | | 52427.00 |

Rs. Fifty Two Thousand Four Hundred Twenty Seven Only

Terms & Conditions

Terms & Conditions
All disputes subject to VARANASI Jurisdiction only.

Goods once sold will not be taken back or exchanged

[illegible]

A/C NO. XXXXXXXXXXXXXXXXXXXX IFSC CODE : XXXXXXXXXXXXXXXXXXXX

A/C NO: XXXXXXXXXXXXXXXXXXXX IFSC CODE :- XXXXXXXXXXXXXXXXXXXX
BANK DETAIL :- XXXXXXXXXXXXXXXXXXXX BRANCH:- XXXXXXXXXXXXXXXXXXXX

BANK DETAIL :-XXXXXXXXXXXXXXXXXXXXX BRANCH:-XXXXXXXXXXXX
A/C NO. XXXXXXXXXXXXXXXXXXXXXXXX IFSC CODE :- XXXXXXXXXXXXXXXXXXXXXXXX

For BLUSH RUSH

Receiver

METADATA & DESCRIPTIVE STATISTICS

Purchase Invoice Metadata

| | | |
|------------|---|--|
| ❖ Name | - | Buyer's Name (Blush Rush here) |
| ❖ Date | - | Invoice Date |
| ❖ NO. | - | Serial Number |
| ❖ PRODUCT | - | Name of the Product |
| ❖ HSN | - | HSN stands for Harmonised System of Nomenclature It classifies 5000+ products under GST |
| ❖ QTY | - | Quantity of Product Purchased |
| ❖ UNIT | - | Measurement Unit |
| ❖ M. R. P. | - | MRP stands for Maximum Retail Price It is the highest price that can be charged by manufacturers for a product before the sale in India |
| ❖ RATE | - | Rate at which Product is purchased |
| ❖ DISC | - | Discount on Product (in %) |
| ❖ GST | - | GST applied (in %) |
| ❖ AMOUNT | - | Total Amount of Product (excluding GST) |

Sales Invoice Metadata

| | | |
|--------|---|--------------------------|
| ❖ Name | - | Retailer's Name |
| ❖ Date | - | Invoice Date |
| ❖ NO. | - | Serial Number |
| ❖ QTY | - | Quantity of Product Sold |

| | | |
|------------|---|--|
| ❖ PACK | - | Measurement Unit |
| ❖ PRODUCT | - | Name of the Product |
| ❖ HSN | - | HSN stands for Harmonised System of Nomenclature It classifies 5000+ products under GST |
| ❖ M. R. P. | - | MRP stands for Maximum Retail Price It is the highest price that can be charged by manufacturers for a product before the sale in India |
| ❖ RATE | - | Rate at which Product is to be sold |
| ❖ SCH. | - | Discount on Product (in %) |
| ❖ AMOU. | - | Actual Amount of Product [= Quantity * Rate] |
| ❖ SGST | - | State GST applied (in %) |
| ❖ CGST | - | Central GST applied (in %) |
| ❖ NET AMO. | - | Final Amount of Product after applying Discount & Tax |

Descriptive Statistics

- The collected data describes the June sale and the corresponding purchase.
- The product was purchased three times from the company during this period. Therefore, there are three purchase invoices.
- These products are sold to three different retailers. Some retailers buy a couple of times a month, while others buy all at once.
- The product is purchased at a much lower price than MRP and has an additional 12 % discount. According to government regulations, 18 % GST (CGST and SGST) applies to purchases.
- The product will be sold at a 32.2 % discount off the MRP, plus 18 % GST.
- Total Products under focus are – 132

Calculation of Final Bill Amount

$$\begin{aligned} X &= \text{Rate} * \text{Quantity} \\ Y &= X (1 - (\text{Discount} / 100)) \\ \text{Amount} &= Y (1 + (\text{Tax} / 100)) \end{aligned}$$

In case of Purchase,

| | | |
|----------|---|------------------------|
| Rate | - | A Price lower than MRP |
| Discount | - | 12 |
| Tax | - | 18 |

In case of Sales,

| | | |
|----------|---|------|
| Rate | - | MRP |
| Discount | - | 32.2 |
| Tax | - | 18 |

ANALYSIS PROCESS / METHOD

Transforming Data into Desired Format:

These collected invoices are combined and converted into two separate Excel spreadsheets. One contains purchase data and the other contains sales data. The invoice table remains unchanged and two columns, date and retailer's name, are added to these sheets.

For Purchase

| Date | Product | HSN | Quantity | Unit | MRP | Rate | Discount | GST | Amount |
|------|---------|-----|----------|------|-----|------|----------|-----|--------|
|------|---------|-----|----------|------|-----|------|----------|-----|--------|

For Sales

| Retailer | Date | Product | HSN | Quantity | Unit | MRP | Rate | Discount | GST | Amount |
|----------|------|---------|-----|----------|------|-----|------|----------|-----|--------|
|----------|------|---------|-----|----------|------|-----|------|----------|-----|--------|

These sheets are then filtered and unwanted features like HSN, Unit are removed.

Both of these sheets are then combinedly used to other sheets like ledger.

Current Status:

Sheet – 1: Calculations

| Product | HSN | Purchase Discount | Purchase Rate | Purchase Rate (After Discount) | Sales Discount | Sales Rate (After Discount) |
|---------|------|-------------------|-----------------------------------|--------------------------------|----------------|-----------------------------|
| CGST | SGST | Total GST | Net Purchase Rate (Including Tax) | Net Sales Rate (Including Tax) | Net Profit | Maximum Profit to Retailer |

Sheet – 2: Purchase

| PRODUCT | DATE | QUANTITY | MRP | RATE | AMOUNT |
|---------|------|----------|-----|------|--------|
|---------|------|----------|-----|------|--------|

Sheet – 3: Sales

| PRODUCT | RETAILER | DATE | QUANTITY | MRP | RATE | AMOUNT |
|---------|----------|------|----------|-----|------|--------|
|---------|----------|------|----------|-----|------|--------|

Creating Ledger of Stock:

To solve the above problems, we first create an inventory ledger. The stock ledger is a tabular collection of the daily opening and closing amounts of each product. This helps identify fast-moving and slow-moving products, and then planning which products to buy and how much.

Making Pivot Tables:

A pivot table is a table of values grouped to group the individual elements of a larger table into one or more discrete categories. It helps us to focus on a small portion of the data and analyse what things are lagging behind.

Plotting Graphs:

Graphs and charts are used to visually depict data and make it easy for us to find trends and trend breaks in data points. It clearly shows what factors are causing these problems.

Analysis Tool Used: → Microsoft Excel

THANK YOU