BDM CAPSTONE PROJECT

IIT MADRAS
BS DEGREE PROGRAM

भारतीय प्रौद्योगिकी संस्थान मद्रास

ASSESSMENT OF "Modern Pipe & Sanitation" DIFFICULTIES AND SOLUTIONS TO THEM USING DATA ANALYSIS

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COURSE CODE-BSCMS2001P

PROGRAM NAME-BS Degree in Data Science and Applications from IIT Madras (Diploma Level)

CONTENT

MID TERM SUBMISSION FOR BDM CAPSTONE PROJECT

The offered drive connection contains all the important documents and multimedia. It includes the Excel workbook as well as some intriguing insights. Access it with official IIT-M id.

https://drive.google.com/drive/u/2/folders/161vasjOOKOHRl4UwhUW3ANLrwjBL8Q0x?us%20p=sharing

EXECUTIVE SUMMARY AND TITLE

ASSESSMENT OF "Modern Pipe & Sanitation" DIFFICULTIES AND SOLUTIONS TO THEM USING DATA ANALYSIS.

For my IITM-BS course's Business Data Management Project, which requires a student to gather, analyse, and use primary data from any business firm in the organized or unorganized sector. To start with my project, I took an appointment of Mr Abhay Agrawal representing **"Modern Pipe and Sanitation"**. They typically manage the data in a software named "Busy Accounting Software". Since it was impossible to comprehend all the data in a single meeting, I spoke to the owner quite often. I asked him to discuss the difficulties he is having in this business as part of this survey. I also gather some miscellaneous information like expenses in maintaining the shop, staff etc.

Some problems which were discussed by him as he stated was "If your revenue is insufficient to survive in the market, there is too much rivalry and a low profit margin in this business type.So major problems to tackle are optimal capital investment, hold on more construction site, and profit margin analysis.

A wise man once remarked, "Data really powers everything that we do." and a quick glance at the shop's data gave me an idea of the issues and the way it could be dealt with. We'll look at the most popular SKUs and do price analysis to help them compete. To address the second issue, we will assemble and sort SKUs depending on the average revenue earned using MS Excel and its pivot chart / visualisation tool features.

PROOF OF ORIGINALITY OF DATA

LETTER FROM ORGANIZATION:

GSTIN :22AFKPA9921R1Z2

MODERN PIPE & SANITATION

POWER HOUSE ROAD KORBA (CHHATTISGARH)

To IIT-M: 22 March 2023

We, Modern Pipe and sanitation, hereby declare that the data was created and is owned by our organization. We hold the copyright and other intellectual property rights to this document.

The data is created in busy accounting software. The manager of the document is Mr Abhay Agrawal. This data is original and unique. We confirm that the data does not infringe on the copyright or intellectual property rights of any other party. If you require any further information, please do not hesitate to contact us. Our contact information is as follows:

Power House road, beside jk tower , Korba

+91 6262408633 /agrawal.abhay19@gmail.com

Sincerely,

Abhay Agrawal

Modern Pipe and Sanitation, Korba

Modern Pipe & Sanitation

Proprietor

Figure 1

SNAP OF A BILL:

Duplicate Cop

TAX INVOICE

MODERN PIPE AND SANITATION

J.K. TOWER, POWER HOUSE ROAD KORBA

GSTIN : 22AFKPA9921R1Z2

Tel. : 9827941466 email : modernpipe.krb@gmail.com

Party Details :
M/S M S PATEL
KORBA

Party PAN : AFPPP3642H
Party Mobile No :
GSTIN / UIN : 22AFPPP3642H1ZD

Invoice No. : CREDIT/459
Dated : 08-02-2023
Place of Supply : Chhattisgarh (22)
Reverse Charge : N
P.O. NO :
P.O. DATE :
PAYMENT TERMS:- : CREDIT
Challan no. :
RECEIVED BY :

S.N.	Description of Goods	HSN/SAC Code	Qty.	Unit	List Price	Discount	Price	Amount ( )
1.	SQ. GULLY TRAP 4"	3917	3.00	Pcs.	296.00	0.00 %	296.00	888.00
2.	R/Fit Coupler 110mm	3917	64.00	Pcs.	88.00	0.00 %	88.00	5,632.00
3.	R/Fit Door Tee 110mm	3917	30.00	Pcs.	190.00	0.00 %	190.00	5,700.00
4.	R/Fit Door Bend 87.5* 110mm	3917	30.00	Pcs.	133.00	0.00 %	133.00	3,990.00
5.	CPVC Elbow 90* 1/2"	3917	70.00	Pcs.	12.00	0.00 %	12.00	840.00
6.	CPVC Br Elbow 1/2"	3917	70.00	Pcs.	49.00	0.00 %	49.00	3,430.00
7.	SWR Solvent 250 ml	35061000	9.00	Pcs.	120.00	0.00 %	120.00	1,080.00
8.	SQ. GULLY TRAP 4"	3917	4.00	Pcs.	296.00	0.00 %	296.00	1,184.00
	Grand Total		280.00	Pcs.				22,744.00

HSN/SAC	Tax Rate	Taxable Amt.	CGST Amt.	SGST Amt.	Total Tax
35061000	18%	915.26	82.37	82.37	164.74
3917	18%	18,359.30	1,652.35	1,652.35	3,304.70
Total		19,274.56	1,734.72	1,734.72	3,469.44

Rupees Twenty Two Thousand Seven Hundred Forty Four Only

Figure 2

INTERACTION SNAP:

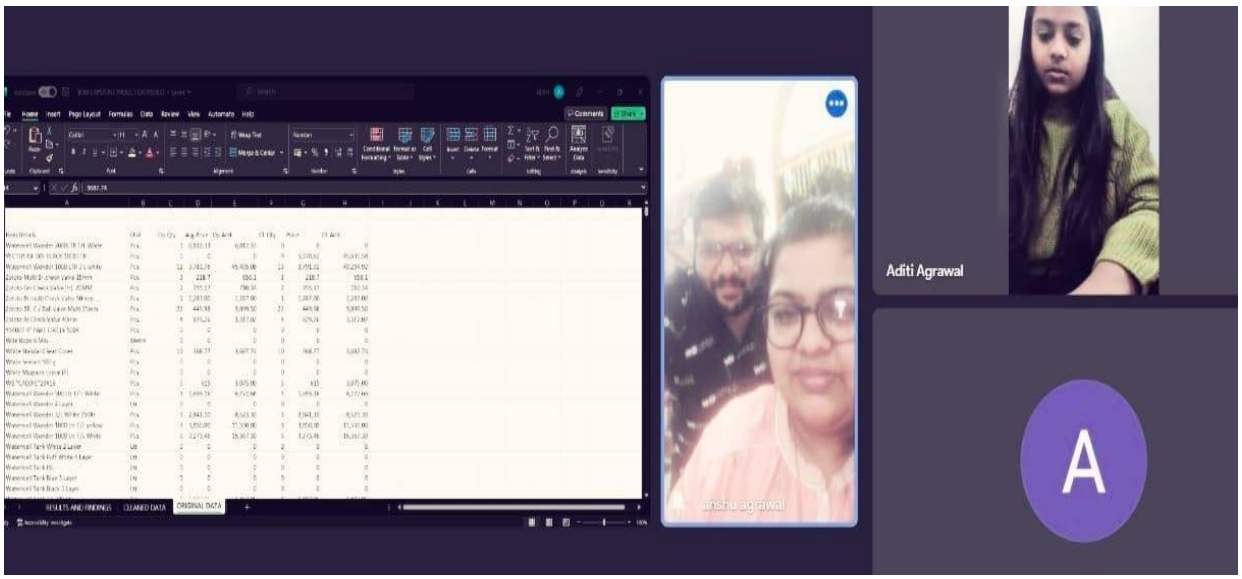

Figure 3

This is a snap of a meet with Mr. Abhay Agrawal and Mrs. Anshu Agrawal.

Figure 4

PROBLEM STATEMENT

● TO OPTIMIZE CAPITAL INVESTMENT WITH INCREMENT IN SALES AND REVENUE

● TO BALANCE SALES AND INVENTORY PROPORTIONALITY.

This are the problem statement which will have major focus in the analysis.

METADATA AND DESCRIPTIVE STATISTICS

To begin, detailed analysis of the provided data is required to achieve the goal. Mr. Abhay Agrawal shared with me an excel sheet which has data of about a year. It has following columns:

- Item Details: The "Item Details" column in Busy accounting software typically contains information related to the items or products being sold or purchased.

- Unit: In the "Unit" column, the unit of measurement for the item is typically mentioned. The unit column specifies the unit in which the item is sold or purchased.
  For example, if the item is a quantity of a product, the unit column may mention. "pieces" or "units."

- Opening Qty: "Opening Quantity" column typically contains the quantity of the items or products that were available in stock at the beginning of a financial year or at the start of the accounting period. This column is used in inventory management and is particularly helpful in keeping track of the stock level of items. By entering the opening quantity of each item, the software can calculate the closing stock of the items based on the quantity sold or purchased during the accounting period. This information is important for businesses to manage their inventory effectively and make informed decisions about restocking, pricing, and promotions.

- Avg. Price: The average price is calculated by dividing the total cost of the item by the total quantity of the item sold or purchased. This calculation considers the cost of all the items purchased or sold, including any taxes, discounts, or other charges. The "Avg. Price" column is important in inventory management because it helps businesses to calculate the cost of goods sold (COGS) and the value of the closing stock.

- Opening Amount: “Opening Amount" column typically contains the total value or amount of the items or products that were available in stock at the beginning of a financial year or at the start of the accounting period. This column is used in

inventory management and is particularly helpful in keeping track of the value of the opening stock of items.

- Closing Quantity:" Closing Quantity" column typically contains the quantity of the items or products that are available in stock at the end of a financial year or at the end of the accounting period.

- Price: The price column usually includes the cost per unit of a product or service. This column is used to record the unit price at which a customer or client purchases a product or service. The price column can appear in a variety of transaction entries, including sales invoices, purchase invoices, debit notes, credit notes, and so on.

- Closing Amt: "Closing Amount" column typically contains the total value or amount of the items or products that are available in stock at the end of a financial year or at the end of the accounting period. This column is used in inventory management and is particularly helpful in keeping track of the value of the closing stock of items.
  STATISTICS

  In addition, I added following columns using some normal statistics and mathematics such as:
  - TOTAL SALES: It is sum of the total amount generated by each product. Data was also sorted from descending to ascending order so that it is clear which products contribute the most to revenue generation.
  - AVERAGE SALE PRICE: It is obtained by dividing total sale by sale quantity.
  - MARGIN PERCENT: It talks about the profit on a particular product which is obtained by the formula-
    ((Average sales price- Average price)/Average price) *100
  - SALES QUANTITY: "Sale" column typically contains the total amount of sales made for each item or product during a specific period. Sales is basically opening quantity subtracted by closing quantity.
    This addition revealed some real insights about the data.

DETAILED EXPLANATION OF ANALYSIS PROCESS/ METHOD

Cleaning and sorting data are required, which, of course, contains many errors. After the data has been cleaned, analysis is straightforward.
The main issue with the sheet is that it contains over a thousand products, many of which do not have purchase and sale (inactive SKU), making them useless for analysis.
After cleaning the data, there was near about 300 products. Following this, I attempted to determine how I could obtain information and draw conclusions based on the business's difficulties.

1.DEPENDENCY OF PRICE AND SALES OF PRODUCT

Figure 5

The Price of product is having no effects on its sales. So, it clearly shows that sales depend on product's usage and its demand and not on price.

2.PARETO PRINCIPLE

A Pareto chart is a graphical tool for representing the relative frequency or size of various data categories. It is based on the Pareto principle, which states that approximately 80% of effects are caused by 20% of the causes. So, we can apply this rule by finding the 20 percent product which contributes to 80 percent sales. Although I have already sorted the data on the basis on sales. Listed below are 12 top products which contributes around 63 percent of total sales.

Table 1

Products	Percentage in total sales
R/Fit Coupler 110mm	13
R/Fit Plain Bend 87.5* 110mm	12
R/Fit Plain Tee 110mm	9

R/Fit P Trap 110 X 110 mm	6
R/fit Bend 45.0* 110mm	5
Plasto Tank 3 L 1000 Litre	5
G.I. Pipe 6" 150mm	3
Astm Elbow 90* 1.1/2”.	3
Astm Brass Elbow 1/2”. V	3
R/Fit Nahani Trap 110 X 75 mm	2
Astm Tee 1".	2

3.Margin and average sales price

Figure 6

Here we can see even though profit margin is very high in some case like in Astm Tee 1"(P_ID=11). There is not a major difference between Average price and Average sales price. This is because Average sales price also depends on quantity of item sold as it is obtained by dividing total sale by sale quantity.
So, by analysing this we can increase or decrease our margin accordingly to increase the overall profit and revenue. For product ID reference use excel sheet provided.

4.EXPENDITURE ANALYSIS

I obtained data from the owner and entered it into an excel spreadsheet for expense analysis. I ran a pie chart analysis on that data and discovered that salary was the most expensive category.

RESULTS AND FINDINGS

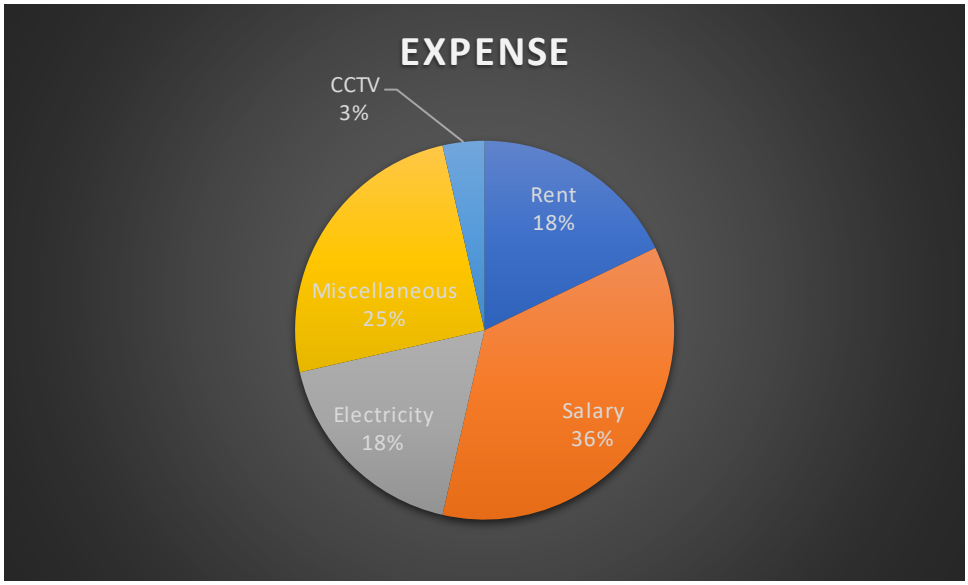

Figure 7

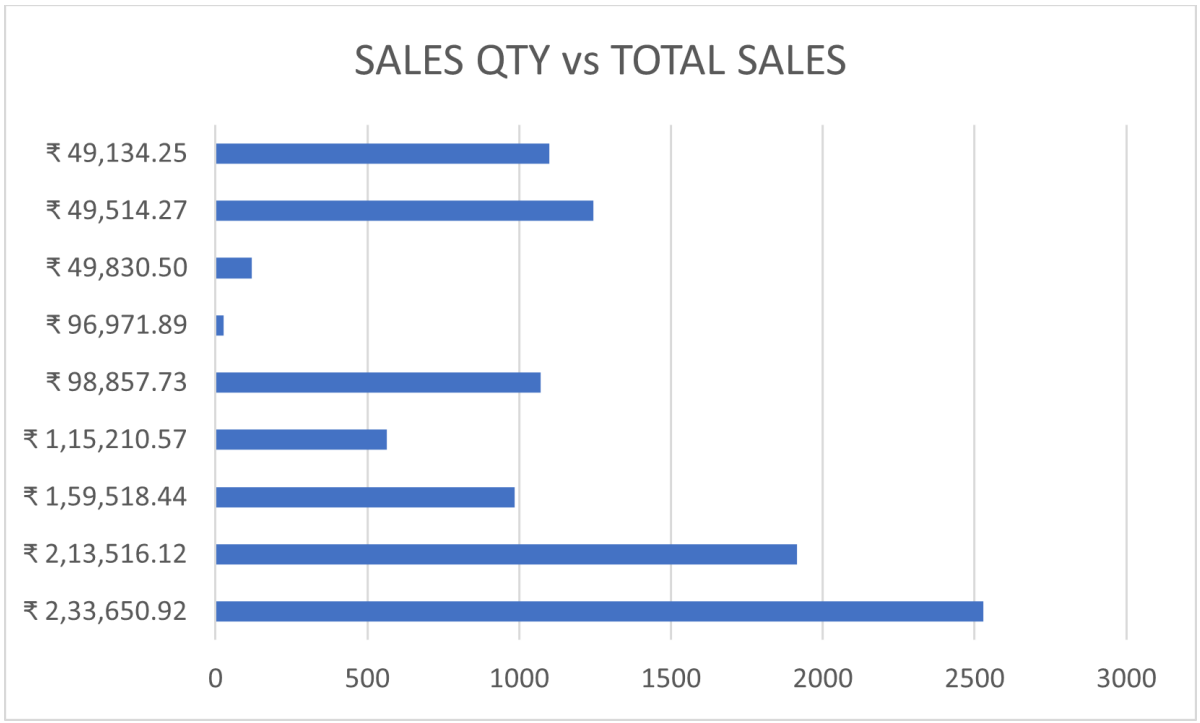

Figure 8

I started by analysing sales statistics. I chose some top SKUs with a high overall selling value during the period. Also, I did expenditure analysis which are generally not in the eye of businessman. Afterall Saving is Earning too. A quick margin analysis is also done which can be further explored to find some interesting pattern which can help in optimal capital investment.

Also, total sales vs sales quantity gave some interesting insights. There are some products which are sold frequently and contributed a lot to total sales revenue. This means they have fair demand and contributes to revenue generation too.

The following drive link contains the excel sheet of original data and cleaned data. It has also result and findings. Some of the snaps of graphs and charts are used in above explanation also.

https://drive.google.com/drive/folders/161vasjOOKOHRl4UwhUW3ANLrwjBL8Q0x?usp=sharing (Note-Access with IIT-M mail only)