

# BDM Capstone Project

(Mid-term Report)

**Optimizing the Business Model of a Retail Steel  
Furniture Business**

Submitted By –

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# OPTIMIZING THE BUSINESS MODEL OF A RETAIL STEEL FURNITURE BUSINESS

## EXECUTIVE SUMMARY

This is the detailed report of originality of data, meta data & descriptive analysis, analysis process/methods and results & findings from data till now. All the data was collected by hands and processed in Excel Worksheets. For this study, I have collected data from Nav Bharat Sales, Market and Online sources. The data is primary and for the check, photos, video and links are given. For descriptive analysis “analysis tool pack” was used. Pivot tables, graphs and inbuilt formulas were used for presentation and findings. Under Meta Data section content and context of every table is described. It was found that Powder Coated Almirahs and Coolers have an equal share in the revenue but number of units sold have a huge difference. And answers for the questions like “which categories in Powder coated Almirahs are most popular at Nav Bharat Sales and in market?”, “what is demand in market” and “How much cost will be incurred for constructing manufacturing unit?” are given in results & findings section. Also, graphs are given at the end of the report that are related to the results. Till here, from four parts of the analysis, three are covered that are descriptive, diagnostic and prescriptive analysis, now, only predictive analysis is left that will tell “What will happen in the future?”.

## PROOF OF ORIGINALITY OF THE DATA

For this study I had collected the data from three sources; Nav Bharat Sales, Steel Market of Lashkar, and for machineries I had preferred online source IndiaMart. I had tried to contact the leading suppliers of almirah making machines **Raviraj Industries**, through mail and WhatsApp but I didn’t get any response. Fortunately, they have a detailed portfolio on **IndiaMart** which helped me to figure out the prices and description of the required machines for this manufacturing unit. Below I have attached the link of the data.

Link for the data → [link](#)

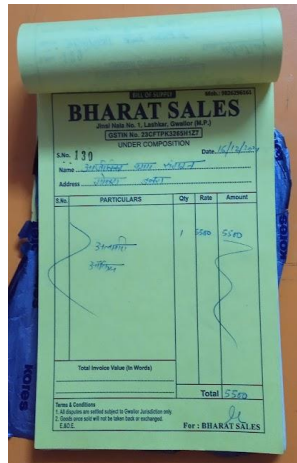
### A. Data from Nav Bharat Sales:

#### 1. Sales Data of all the products:

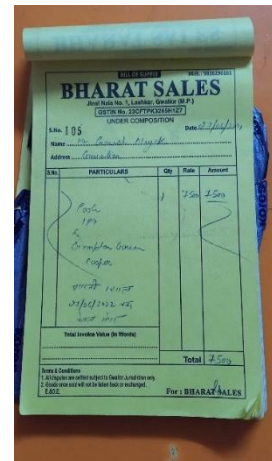
I had collected this data from the previous bills of Nav Bharat Sales from **FY 2021-22 to FY 2022-23**. Basically, when a customer buys a product from them, they provide a

hand written bill to the customer which is copied on another paper with the help of carbon paper. According to them this is useful for checking eligibility of warranty period and booked products. Below are some photographs of the bill and a link of a video for the reference.

Video Link → [link](#)



**Fig.1 Sales Bill**



**Fig.2 Sales Bill**

## 2. Data of products, cumulative cost price and average selling price of all the products:

The list of products was collected from the books that contain purchases from the manufacturer, through the shop's products and from the sales data (if the product wasn't in the other two things). Below are some purchase bills.



**Fig.3 Purchase Bills**

## 3. Salaries:

Nav Bharat Sales has 3 employees from which one is salesman and other two are workers. They are daily wages worker. And according to owner, a salesman takes **500 Rs** per day and a worker takes **300 Rs** per day.

#### 4. Extra Expenses for running the business:

This includes electricity bills, stickers expense (For branding they make their own stickers), and other small expenses to run the business. All these data will be available inside Profit and loss statement. Below is one of the stickers.



Fig.4 Sticker

### B. Data from Market:

#### 1. Demand of Powder Coated Almirahs in the market:

This data I had collected with the help of the owner. As we know that every market has its own camaraderie, I took the benefit of this and collected this data.

#### 2. Labour cost (For manufacturing almirahs):

This data is also gotten possible just with the help of the owner, because they are directly in-touched with the manufacturers and explained me in detail how much and what are the responsibilities of each person in the process of making almirahs.

#### 3. Steel price:

According to the owner for making these almirah, **0.8mm** metal sheet is used and the rate is around **80 Rs/Kg**. And an almirah is of around **70-90Kg**.

### C. Data for Manufacturing unit:

#### 1. Machines cost:

I have collected this data from IndiaMart. Below are the photographs of the machines that are required and link of the product.



**Fig.5 Machine**

Hydraulic Power Press  
Machine C Type 30ton

[link](#)



**Fig.6 Machine**

Pillar drill machine  
Ms 13 Mm

[link](#)



**Fig.7 Machine**

Powder coating  
machine/gun

[link](#)



**Fig.8 Machine**

Spot Belding  
machine

[link](#)



**Fig.9 Machine**

Almirah Making Mini  
Hydraulic Press

[link](#)



**Fig.10 Machine**

Powder coating oven 81  
Litres

[link](#)



**Fig.11 Machine**

Mechanical Under Crank  
Shearing Machine 2030x2MM

[link](#)

## 2. Cumulative cost of building the manufacturing unit:

For this data I have took help from my family. It will be an approximate cost that is required.

## 3. Cost of commercial electricity supply:

This data is same for the region that's why I will get it from the online official source of Madhya Pradesh (Kshetra Vidyut Vitran Co.Ltd).

## METADATA AND DESCRIPTIVE STATISTICS

### Table : Sales Data

This table contains the sales data of Nav Bharat Sales. This data will help in finding the following things:

➔ Sales of powder coated almirahs in year from 2021-23.

- ➔ Selling price in the “**Product Data**” Table. It is the **average price** of a particular kind of product. I have done this normalization because they don’t sell products on fixed price and this thing will help in calculating the average profit margin of each product.
- ➔ Also, this table will play a major role in evaluation process for comparison.

**Content:**

Data Types		Description
1.	Product Name	Name of the Product which is sold.
2.	Type	There are different categories of a particular product, e.g., cooler have Cooper Exhaust, Aluminium Exhaust etc.
3.	Size	A product category can have different sizes, e.g., Copper Exhaust can have 12-inch, 15-inch and 18-inch.
4.	Price	This is the selling price of the product sold. It is not similar every time because this is a retail business and they don’t sell products on fixed MRP.
5.	Date	Date of product when it was sold.

**Descriptive Statistics:**

Price of Sales Data	
Mean	6735.574549
Median	5150
Mode	4500
Standard Deviation	3755.010769
Sample Variance	14100105.87
Minimum	1700
Maximum	18500
Sum	7092560
Count	1053

Here, Data Analysis tool pack of Excel is used for the descriptive statistics.

**Table : Product Data**

This table contains the product that are available at the shop. This data will help in finding the following things:

- ➔ Average profit margin of the products.
- ➔ Which product is giving highest profit?

- ➔ Comparison of the cost price from other manufacturer's product to the product that they will manufacture.

**Content:**

Data Types		Description
1.	Name	Name of the Product available at the shop.
2.	Type	There are different categories of a particular product, e.g., cooler have Cooper Exhaust, Aluminium Exhaust etc.
3.	Size	A product category can have different sizes, e.g., Copper Exhaust can have 12-inch, 15-inch and 18-inch.
4.	Selling Price	Selling price of the product. It is average price of same products.
5.	Cost Price	Cost price of a particular product, that they buy from the manufacturers.

**Descriptive Statistics:**

	Selling Price	Cost Price
Mean	9272.212121	7624.242424
Median	9510	7100
Mode	#N/A	10500
Standard Deviation	5040.234845	4569.346254
Sample Variance	25403967.3	20878925.19
Minimum	1907	1400
Maximum	20500	17900
Sum	305983	251600
Count	33	33

Here, Data Analysis tool pack of Excel is used for the descriptive statistics.

**Table : Machinery**

This table contains the machine that are required for manufacturing unit and need to be purchased. This data will help in finding the following things:

- ➔ How much money they need for purchasing the machinery.
- ➔ Play role in calculating the break-even of the business.

**Content:**

Data Types		Description
1.	Machine Name	Name of the Machine that is required for manufacturing unit.
2.	Price	Price of the machine.
3.	link	Link that will redirect to portfolio of the product.

**Descriptive Statistics:**

Price	
Mean	205035.7
Median	200000
Mode	#N/A
Standard Deviation	133932.9
Sample Variance	1.79E+10
Minimum	21650
Maximum	380000
Sum	1435250
Count	7

Here, Data Analysis tool pack of Excel is used for the descriptive statistics.

**Table : Demand in Market**

This table have the demand of powder coated almirah from different shops in Lashkar Gwalior. It will help in finding the following things:

- ➔ As this project is working on a manufacturing unit, this unit will produce product not just for their shop but also for others. Therefore, this data will help in predicting how much and which product they should produce the most according to the need of market.

**Content:**

Data Types		Description
1.	Name	Name of the owner
2.	Shop Name	Name of the shop in Lashkar, Gwalior.
3.	Demand of powder coated almirah	Number of almirah they need, in a year, for their shop.
4.	Most selling Product	That kind of powder coated almirah that they sell the most.



### Table : Profit & Loss Statement

This table has the profit and loss statement of **FY 2021-22 & FY 2022-23**. Profit loss statements shows lot of things like Gross Profit, Net Profit, Expenses, Salary, opening & closing stock etc. As mentioned above all kind of Expenses can be find in this statement like Salaries, Freight of purchased products and sometime they give free delivery to the customers, Electricity Bills, Stickers and other general expenses. And this data is crucial for the study as this was reducing the net worth of the business. Also, this data will help in evaluation phase.

### Table : Extra Data

This table contain all the other data that is not available in the other tables.

#### Content:

Data Types		Description
1.	Labour Cost (for manufacturing unit)	Cost of labour who will manufacture the powder coated almirah. It is per day salary and I have taken upper bound told by the owner.
2.	Cost for building manufacturing unit	This is a cumulative cost of the for building a shed or workshop for the working process. It is assumed that it will be a teen shed.
3.	Steel Price	Price of steel sheet 0.8 mm per Kg
4.	Powder Price	Price of Powder that is used for coating the almirahs per Kg
5.	Cost of commercial electricity supply	Price of electricity supply per unit.
6.	Extra Cost	Every business has its own extra expenses so, it should be considered also. For this business they need more small tools. And extra cost is majorly considering this.

### EXPLANATION OF ANALYSIS PROCESS/METHOD

Recently, I have completed my Business Analytics Course of Diploma in Data Science in this BS Degree. And from there I have learnt few insights, that we have four stages of analytics; Descriptive (“**What happened in past?**”), Diagnostic (“**Why did this happened?**”), Predictive (“**What might happen in future?**”) and Prescriptive (“**What should we do next?**”). As of now three of this four are covered and only Predictive Analysis is left.

- ➔ **Descriptive:** It showed that the net profit was comparatively low as compare to gross profit because of high expenses. Also, powder coated almirah (major part of revenue) was not giving a good profit margin.
- ➔ **Diagnostic:** It was found that because they were buying this powder coated almirah from other city the cost price was going up, and that was causing low profit margin.
- ➔ **Prescriptive:** To this, a solution was found that, they should manufacture their own powder coated almirahs.
- ➔ **Predictive:** Now, in final report, we will see whether this manufacturing unit will increase the profit margin or not?

### **Process used for Analysis:**

From data collection to descriptive analysis till here, I have used Excel sheet.

- ➔ For extracting sub data from the main data, pivot tables were used. I have extracted data of Indori Almirahs from sales data with the help of pivot table. Also, it helped in showing that the powder coated almirahs plays a major role in revenue.
- ➔ For Descriptive analysis I have used analysis tool pack that is available in excel sheets. Although I could also use the formulas for mean, median, mode, standard deviation etc. But this pack reduce this extra calculation and give a consolidate result in one go.
- ➔ Excel have an amazing feature of creating your own formulas and in-built formulas, with the help of this I have calculated net profit, gross profit, averages (AVERAGE & AVERAGEIF), extracted month from the date etc.

### **Cleaning of the Data:**

Getting the data and to clean it was the extremely tedious task because there wasn't any virtual data available from Nav Bharat Sales. I had collected the sales and product data by hands. I cleaned this data and removed few data items, below are the brief description:

- ➔ From sales data, I have removed the orders of customization (when a customer request to customize their product) because in these kinds of orders the shops is just a mediator between customer and the manufacturer. Also, I have removed sales of motors, pumps, folding bed and mattresses because sales of these products were very few and weren't giving any insights. Also, by removing them no major effect was found.

- ➔ From product data, I have removed the products those sales are very low and purchase by Nav Bharat Sales is not significant.

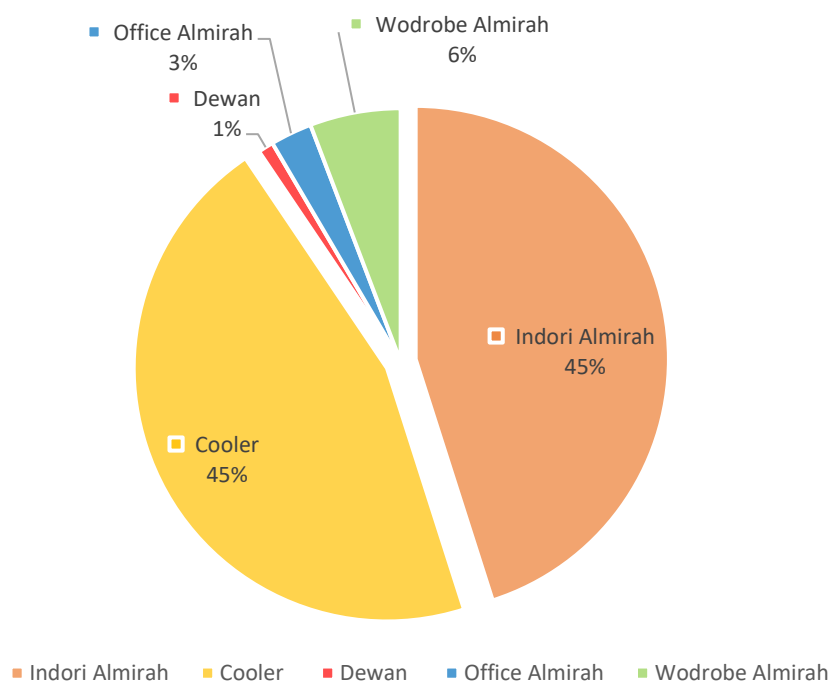
All the other data I have collect was almost clean or approximate like machinery, steel price, demand in market, “Extra Data” table etc.

Below are some insights from the data till now.

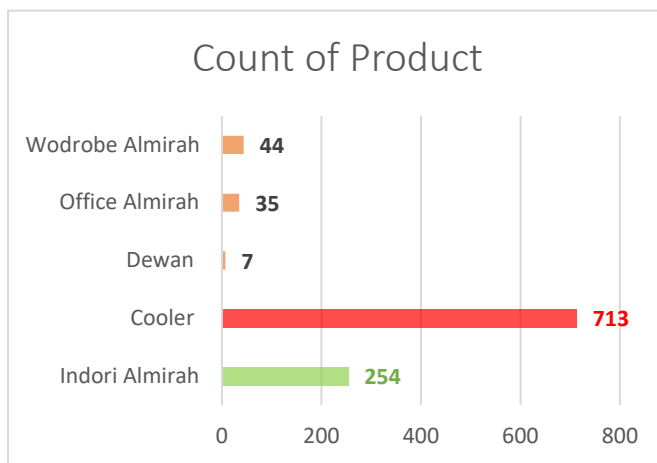
## RESULTS AND FINDINGS

### From Sales Data:

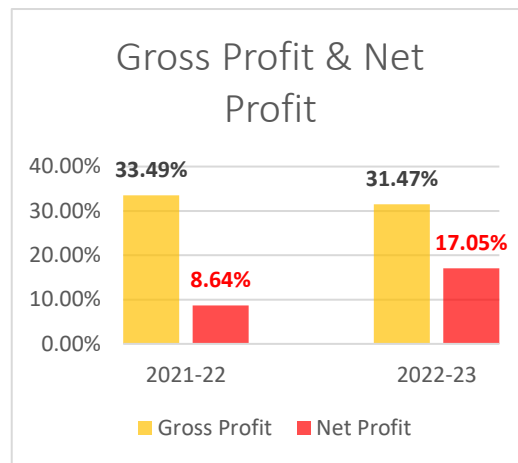
- ➔ There are total of **1053** invoice’s data has been collected. From which Coolers and Indori Almirahs have a share of **45%** each in the revenue. On the other hand, count of sales of these two products has a huge difference. Where sales of cooler are 713, Indori Almirahs just have 254 units sold. Which is showing that Powder coated almirahs are generating high revenue with less efforts.
- ➔ But, on checking the average profit margin of all products, it was found that the profit margin of their “star product” is just half (**15.41%**) as compare to the other products. Which is also decreasing the gross profit.
- ➔ It is found that “**Regular Shoe Daraj**” is the most selling almirah in this product.



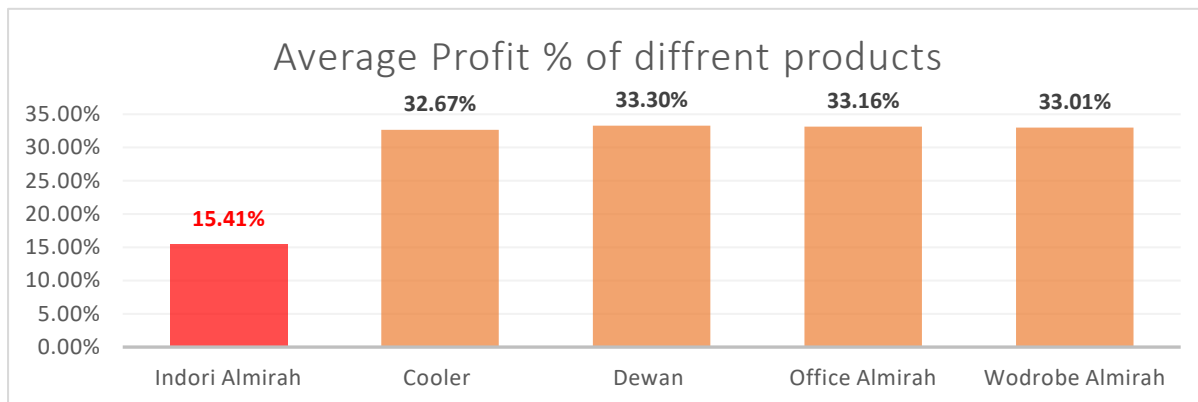
**Fig.12 Share of revenue of different products**



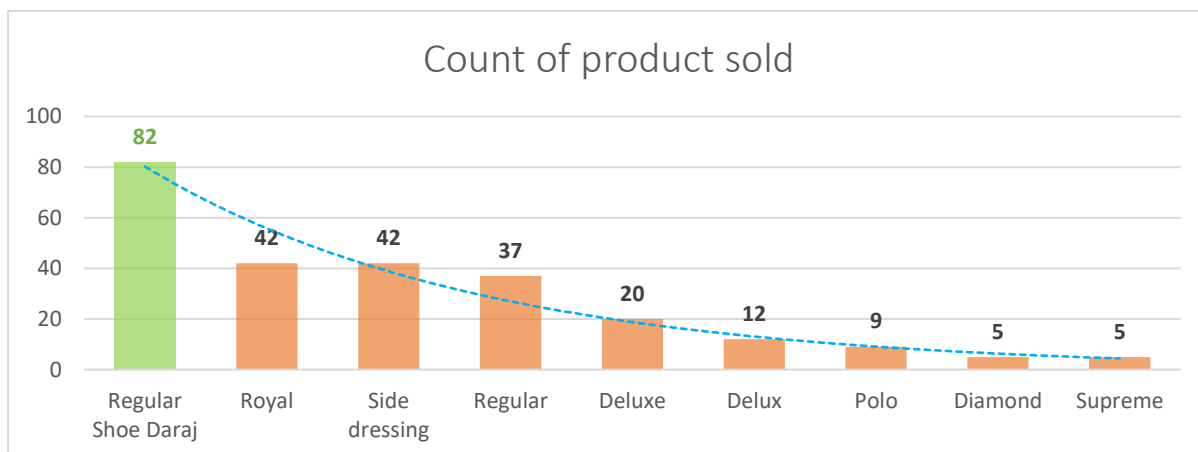
**Fig. 13 Count of sales of different product**



**Fig.14 Gross & Net Profit**



**Fig.15 Average profit percentage of different products of Nav Bharat Sales**



**Fig.16 Number of different kind of Powder Coated Almirahs sold**

#### More Results:

- ➔ For constructing the manufacturing unit, they require a total amount of ₹ 21,35,250 that includes the cost of machines, construction cost and extra cost.
- ➔ There is a demand of 650 almirahs in the market as per the collected data (for a year). And the most selling product are **“Regular Shoe Daraj”**, **“Polo”** and **“Side Dressing”**.

Now, further questions like “Will this unit give profit or not?”, “Calculation of break-even”, “How much products they should manufacture?”, “Cost of finished product” etc. will be addressed in final report.



