

CAPSTONE PROJECT FOR BUSINESS DATA MANAGEMENT  
COURSE, IIT MADRAS

BUSINESS DATA ANALYSIS ON TAANUSHREE  
ENTERPRISES

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## **TITLE OF THE PROJECT:**

**BUSINESS DATA ANALYSIS FOR THE COMPANY TAANUSHREE ENTERPRISES**

## **EXECUTIVE SUMMARY:**

This project report briefly describes the business data analysis of the company “Taanushree enterprises”. Taanushree Enterprises is involved in B2B transactions and offers a range of services to other companies.

The numerous procedures used to analyse the data from the organization's submitted sales bills will be highlighted in this analysis document. This paper also offers information on the various data analytics techniques used to address business issues.

The conclusions after using the several analysis techniques on the four-month data provided by the organisation are well described. Each analysis result is represented by trends and charts for easier viewing. The products are identified and divided into different categories to enhance inventory management.

Finally, the results and findings of the analysis methods are summarised and the recommendations are provided in a bulleted points for the future growth of the Organisation.

## **Data Analysis process:**

To provide answers to business questions, we have requested them to provide their sales bills. We have collected the 4 months sales bills and entered the details of those into the excel spreadsheet. For the given bills, we have created separate sheets for each services the Enterprise has offered (Transport service, can water supply service, housekeeping products supply service and Stationery products supply service).

Even though I have done the data cleaning process before applying the analysis methods which are already mentioned in the mid-term submission report, I have found many discrepancies in the data while analysing it.

Few examples are:

- Different descriptions are given for the same kinds of product and it was missed to notice earlier.

- One of the SKU has 0 bill amount, which is actually a typo in the bill generated. I have asked the correct amount value for the same to the respective person in the organisation and he is looking into it. So, that SKU is removed from the data sheet for further analysis till the confirmation is received.

After started analysing with the updated data, actually I couldn't find any patterns in my results because of the ungrouped selling products. So, I have grouped those product items and created a new columns product ground and Group ID. To say, there are products like dustbin cover which is of different sizes (Small, Medium, Large, Extra Large). We have grouped all these into a single product "Dustbin cover" to get selling pattern from the analysis.

Item name	SKU	Product Group	Group ID
Dust Bin Cover Extra Large-Parostag	HK027	Dustbin Cover	HK16
Dust Bin Cover Extra Large-Parostag	HK027	Dustbin Cover	HK16
Dust Bin Cover Medium-Go green	HK028	Dustbin Cover	HK16
Dust Bin Cover Medium-Go green	HK028	Dustbin Cover	HK16
Dust Bin Cover Medium-Go green	HK028	Dustbin Cover	HK16
Dust Bin Cover Medium-Go green	HK028	Dustbin Cover	HK16
Dust Bin Cover Medium-Go green	HK028	Dustbin Cover	HK16
Dust Bin Cover Medium-Go green	HK028	Dustbin Cover	HK16
Dust Bin Cover Medium-Go green	HK028	Dustbin Cover	HK16
Dust Bin Cover small	HK029	Dustbin Cover	HK16
Dust Bin Cover small	HK029	Dustbin Cover	HK16
Dust Bin Cover small	HK029	Dustbin Cover	HK16

## Data analysis methods:

### Cluster analysis:

It is very useful for exploring and identifying patterns in the dataset created. Grouping of the products based on the revenue, sale quantity helps to concentrate more on the high revenue generating products which yield more profits. Identifying patterns and concentrating on particular group of products will reduce the time and effort of concentrating on low selling products.

### Time series analysis:

This method is used to understand the causes of different trends and patterns to extract valuable insights. By using time series forecasting to analyze sales data of a specific product over time, we can understand if sales rise on a specific period of time. These insights allow us to predict demand and maintain the inventory accordingly.

## **Region wise analysis:**

This method is used to understand the sales pattern of the dataset with respect to the sale regions. If any hidden pattern is found with respect to sales region, we can get better insights.

## **ABC / Pareto Analysis:**

ABC analysis, also known as Pareto analysis, is a method used to categorize something according to its importance or value in a given context. Determining the importance of items or entities helps guide further decisions, such as the level of resources that should be devoted to their oversight. In procurement, for example, ABC analysis can be used to help evaluate items according to the amount of money spent on them. To perform this type of ABC analysis, a list of items is generated in top-down order based on cost per item over a defined time period.

Category A might include the top 20 percent of items, which account for 80 percent of the money spent on the entire list. Category B might be made up of the next 30 percent of items, which represent approximately 15 percent of the total money spent; category C might comprise the bottom 50 percent of the items, which account for just five percent of the total.

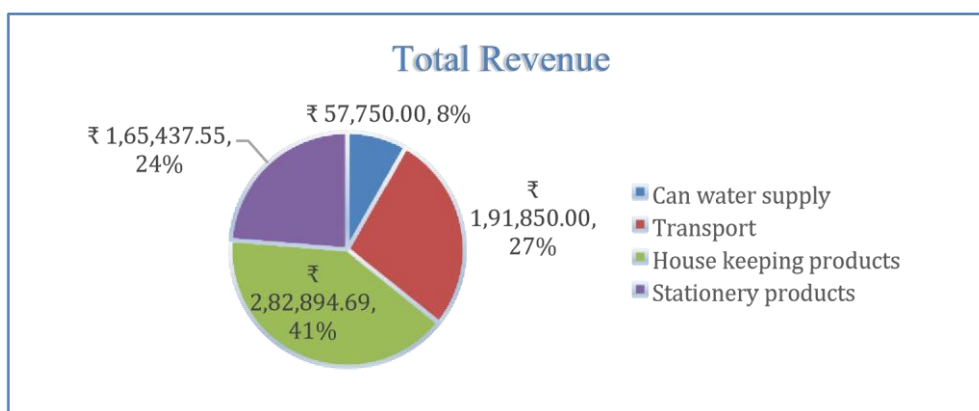
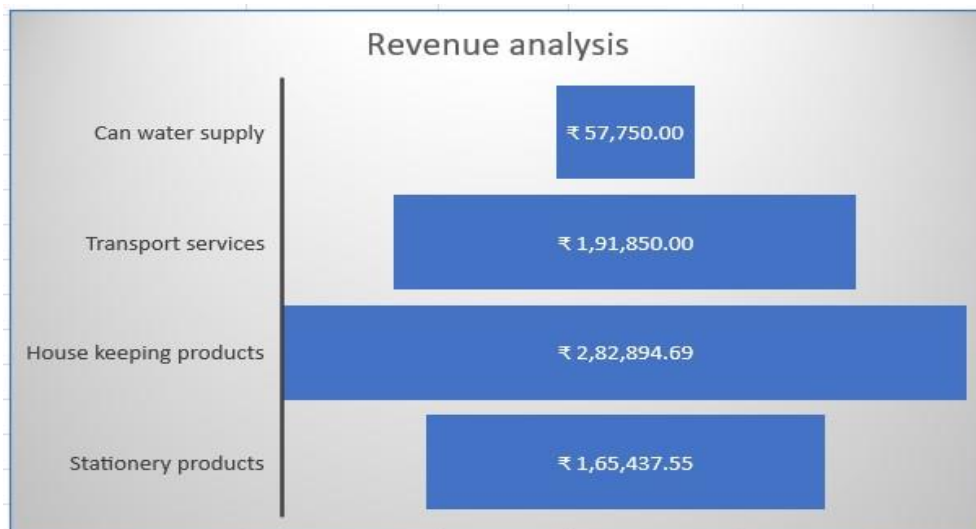
Pareto analysis is a decision-making technique used to statistically separate the data entries into groups with the most or least effect on the data. This will help the business to concentrate more on a particular group of products.

## **Results and findings:**

The data analysis methods are applied on the data sheet created using the different tools of Microsoft Excel and the results are given below.

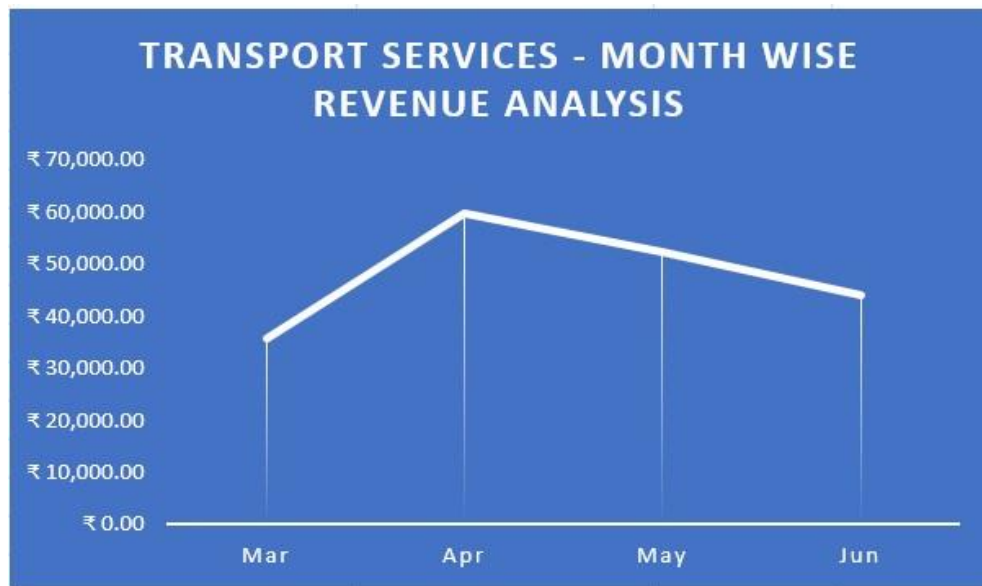
Observation 1:

- 1) Of all the services provided by Taanushree enterprises, from the given 4 months data we could find that the highest revenue is generated from the “Housekeeping products supply services”.



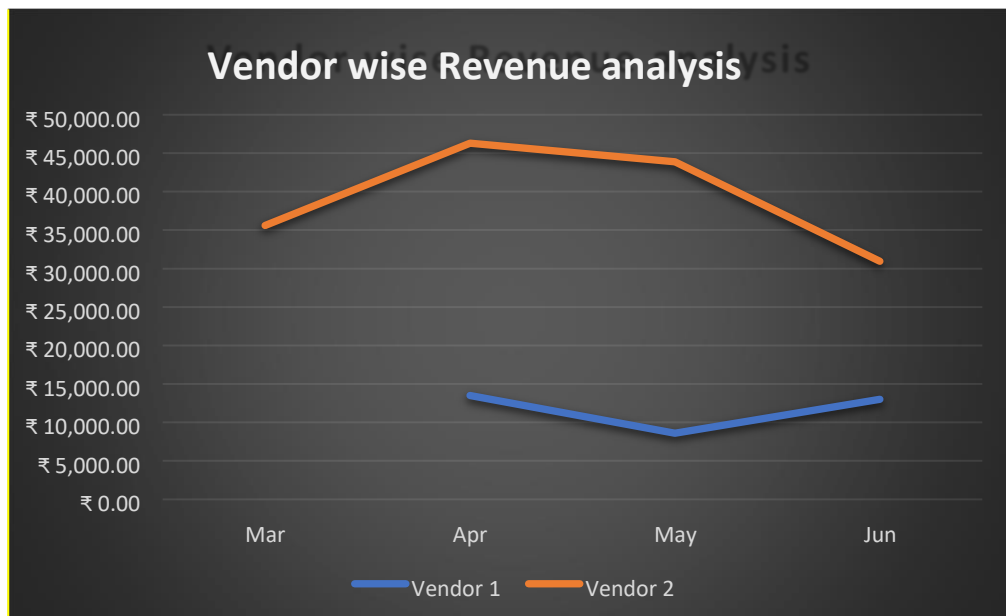
## 2) Observations for Transport services:

- i) From the monthly revenue analysis of transport services, we could observe that the overall revenue generated are reduced over a period of time. We can't presume that the revenue generated by transport services are sloping towards loss with this 4-months data. After talking with the concerned person, we get to know that transport services usually have ups and downs in their revenue curve and this will not affect the future services.



ii)

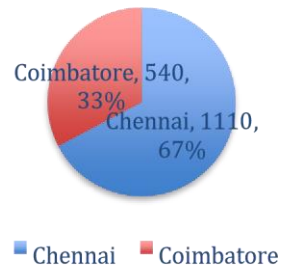
Currently the transport services are offered to only 2 different vendors of the city Chennai. From Vendor2, we could generate more revenue compared to Vendor1. But the revenue generated by the Vendor1 is gradually increasing which is a positive growth for the organisation.



### 3) Observations of Can water supply services:

Taanushree enterprises supplies 25 litres can water to other organisations located in Chennai and Coimbatore. The sale quantity of can water is as twice as higher in Chennai when compared to sale quantity in Coimbatore. Only 8% of the total revenue is generated by the Can water supply. This can be increased if the business owner approaches his Clients/Vendors of other services such as housekeeping and stationery products selling services.

## Can water supply -Region wise sales



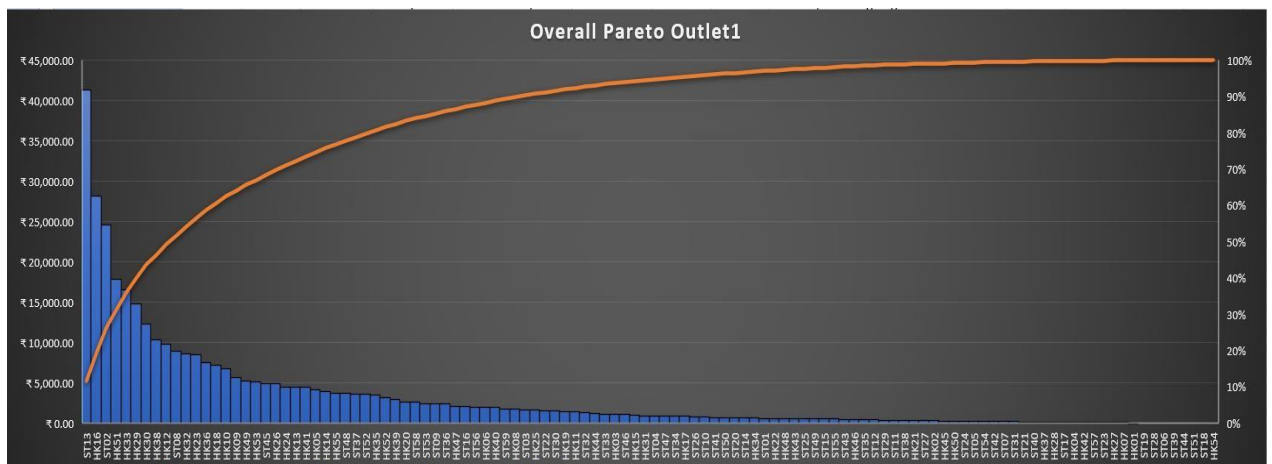
### Analysis on Stationery/House Keeping products supply services:

Taanushree Enterprises currently selling housekeeping products and Stationery products to two outlets in Chennai.

After grouping the similar products in Outlet1, we have 114 total product groups which are sold by the Enterprise. Of these 114 products, 55 are housekeeping products and 59 are stationery products.

### Pareto Analysis:

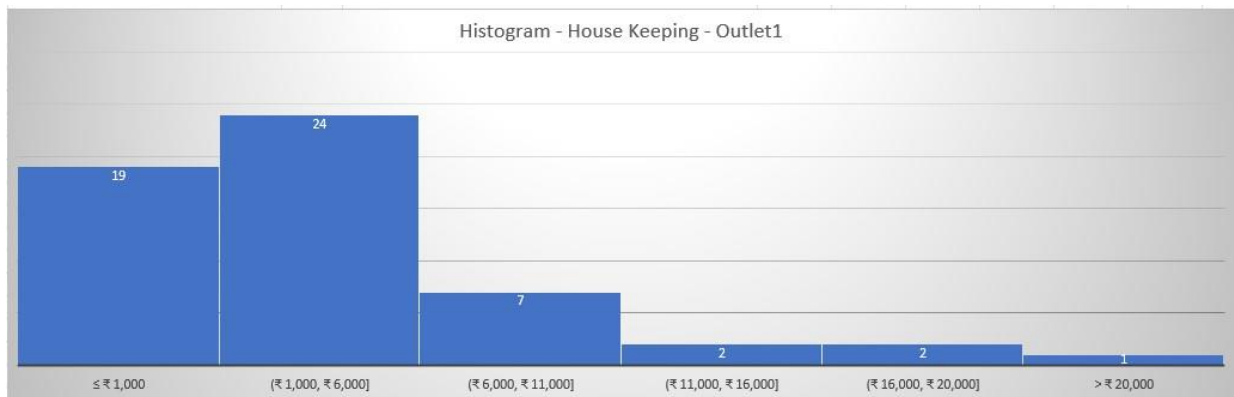
While doing overall product analysis, 25% of products giving 80% of revenue which almost follows the pareto principle and the products SK13 (Cello tape) and HK16 (Dustbin Cover) are the top selling products from both the services.



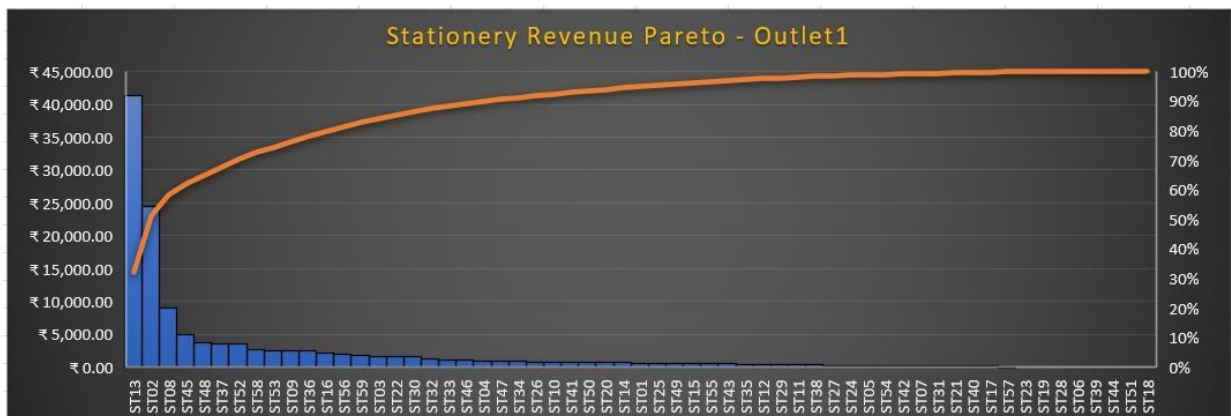
The Housekeeping products alone are not following the Pareto as such 35% of its products generates 80% of the Revenue. The Business needs to concentrate almost 19 items to generate 80% of the revenue.



The Histogram plot of the revenue generated by the housekeeping products is right skewed and almost 50% of the products are generating revenue between Rs 1000 and Rs.6000. This implies that most of the products are having low unit cost less than Rs.10 with average selling quantity.



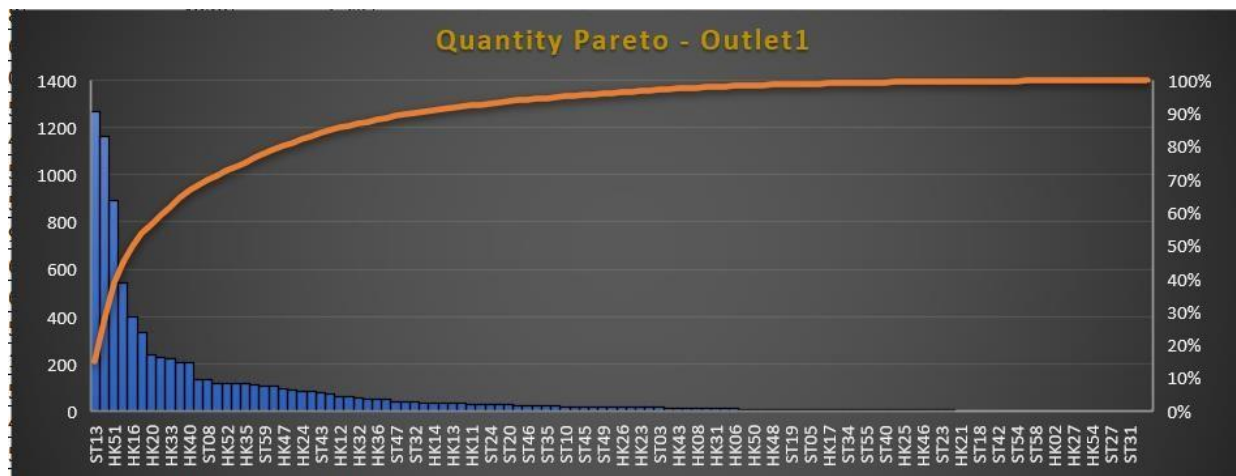
The Revenue analysis on Stationery products exactly follows 20 – 80 Pareto principle. The 12 items among 59 items are generating 80% of the total revenue.



Concentrating on these top selling stationery items yields more revenue in future.

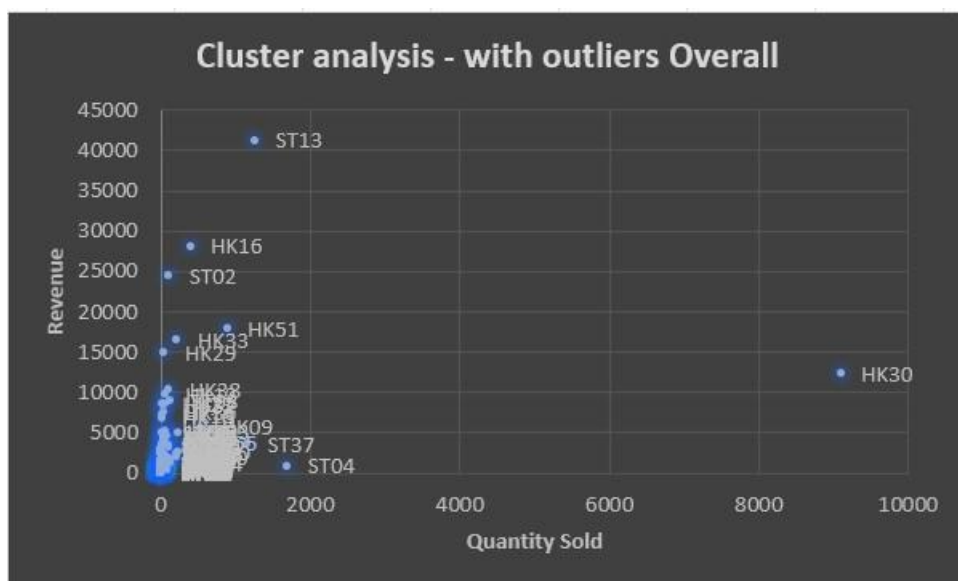


The Pareto analysis on the line item “Quantity sold” follows the 20-80 principle except the few outlier products. The below graph depicts the Quantity pareto chart after removing the outliers HK30 (Mask) and ST04 (Best wishes card) which are sold in high quantity.

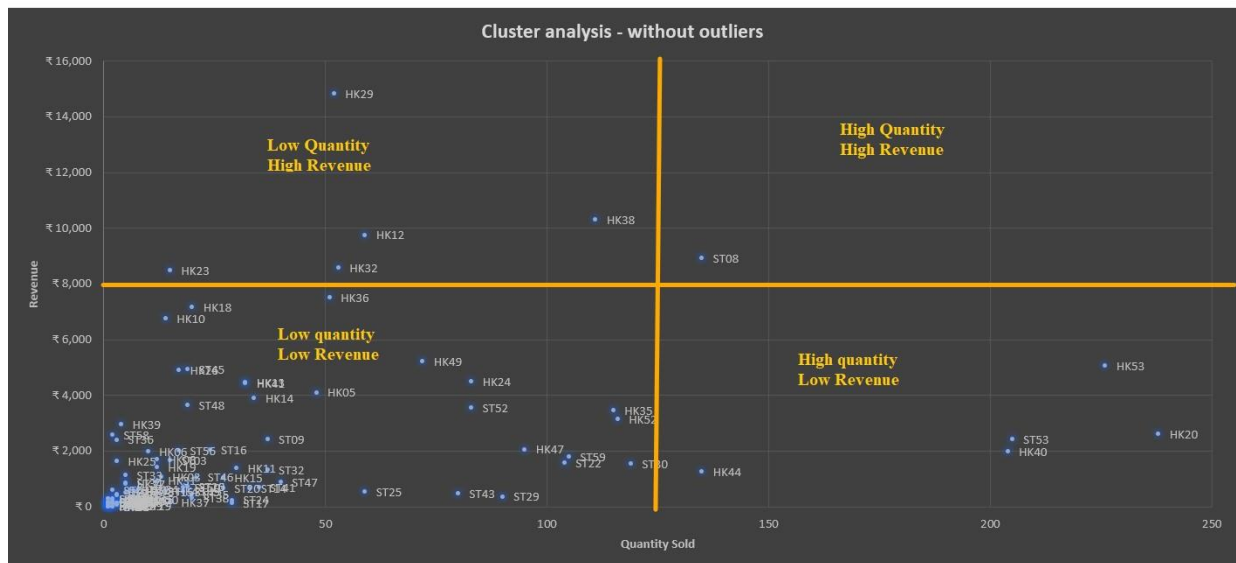


### Cluster Analysis:

“A high level of product knowledge is a way of increasing the added value to a product or service. Understanding your products allows you to present their benefits accurately and persuasively”. We performed Cluster analysis on the sales data to understand the products better.



Due to few outliers, we couldn't get better insights. After removing the outliers, we can categorise the products in a better way which is depicted in the graph below.



The 114 products are categorised into 4 different categories and the snapshot of the same are given below. The Business needs to concentrate on the best-selling products more to generate more revenue. A separate space in inventory should be maintained for these best-selling products.

Category1 - Best products		Category 2 - Worst products	Category 3 - Why these products are selling less?	Category 4
<b>Low Quantity High Revenue</b>		<b>High quantity Low revenue</b>	<b>Low Quantity Low Revenue</b>	<b>High quantity high revenue</b>
ST08	Box File	ST04 - Best wishes card	HK44	HK30
HK52	Urinal Cubes	HK20 - Glass Cloth	ST30	ST13
ST02	A4 Paper	ST53 - Stapler pin	ST59	ST37
HK35	Odonil	HK40 - Scotch bright	ST22	HK51
HK38	Room spray		HK47	HK09
HK24	Godrej aer		ST29	HK16
ST52	Stapler Machine		ST43	HK55
HK49	Toilet Cleaner		ST25	HK53
HK12	Colin		ST47	HK33

Further doing the analysis on the Category 3 products and found that these are moderately selling with low quantity. The business can concentrate less on these products. They can purchase these products from suppliers after the orders placed on these products. By this way we can reduce the space occupied on the warehousing.

The category 2 products are selling more but have less unit price. We can keep track of the orders of these products and manage the inventory accordingly.

Category 3 products	Product name
ST29	Key chain
ST43	Pocket Diary
ST25	Inch tape
ST14	Correction pen
ST17	Envelope
ST24	ID card holder
ST20	Fevi stick
ST35	Paper file
ST38	Pen marker

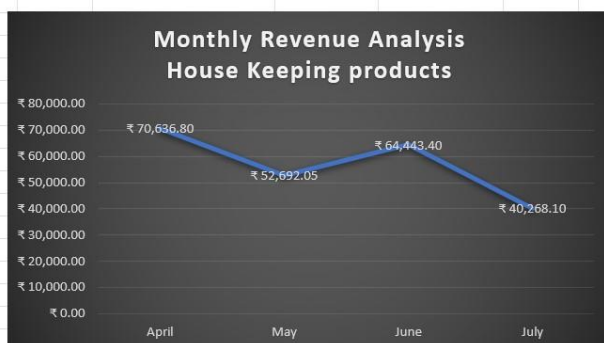
### Monthly revenue analysis:

The monthly revenue analysis for the given months have ups and down curve. The monthly revenue analysis for the top selling and worst selling products are given in the below charts.

Month	Quantity sold	Revenue
April	5100	₹ 1,01,826.30
May	5148	₹ 74,072.05
June	5336	₹ 1,16,849.90
July	3744	₹ 63,579.25

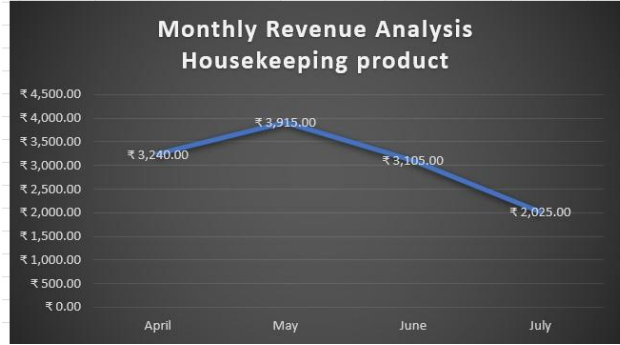


Month	Quantity sold	Revenue
April	3750	₹ 70,636.80
May	4053	₹ 52,692.05
June	3467	₹ 64,443.40
July	2245	₹ 40,268.10

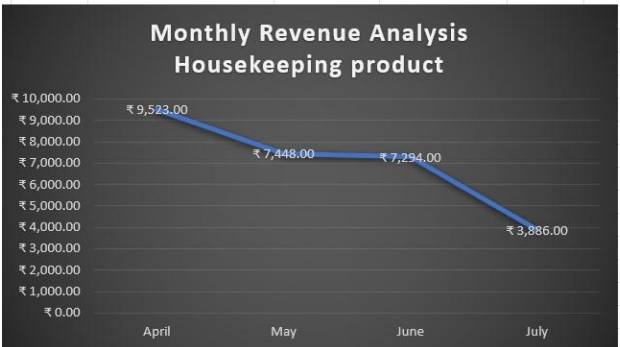


As the covid restrictions are laid down, the selling of Mask, Handwash, and other hygiene related items are reduced. Due to this, the revenue is sloping down in the month of July.

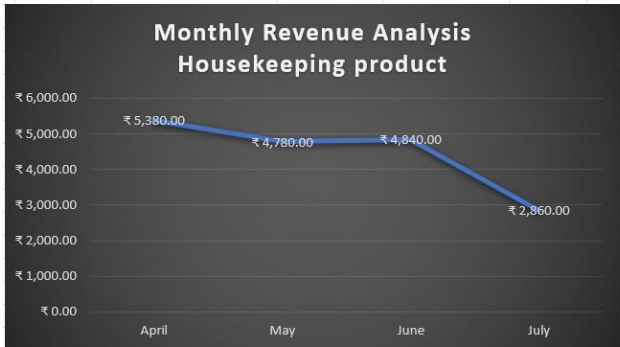
House keeping products	HK30	Mask
Month	Quantity sold	Revenue
April	2400	₹ 3,240.00
May	2900	₹ 3,915.00
June	2300	₹ 3,105.00
July	1500	₹ 2,025.00



House keeping products	HK16	Dustbin Cover
Month	Quantity sold	Revenue
April	140	₹ 9,523.00
May	111	₹ 7,448.00
June	103	₹ 7,294.00
July	45	₹ 3,886.00



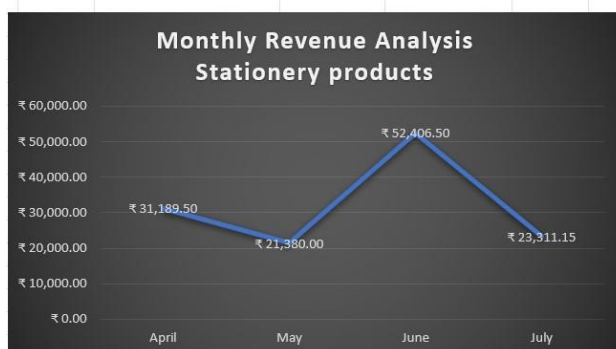
House keeping products	HK51	Toilet Roll
Month	Quantity sold	Revenue
April	269	₹ 5,380.00
May	239	₹ 4,780.00
June	242	₹ 4,840.00
July	140	₹ 2,860.00



Overall, the selling of housekeeping products is reduced continuously which should be addressed by the Business owner.

For stationery products, the curve gets peak at the month of June as the schools are opened and the selling quantity of School related items are high.

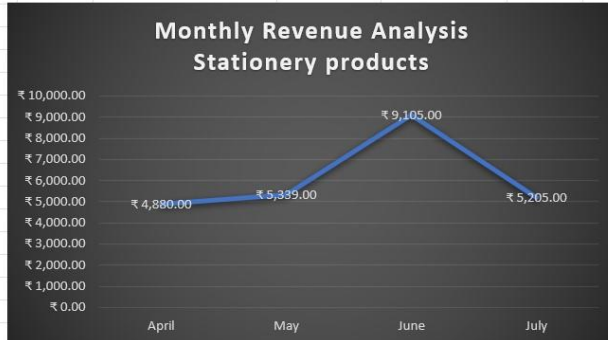
Month	Quantity sold	Revenue
April	1350	₹ 31,189.50
May	1095	₹ 21,380.00
June	1869	₹ 52,406.50
July	1499	₹ 23,311.15



<b>Stationery products</b>	<b>ST37</b>	Pen
Month	Quantity sold	Revenue
April	214	₹ 671.00
May	230	₹ 700.00
June	285	₹ 855.00
July	432	₹ 1,351.00



	Stationery products	ST02	A4 Paper
	Month	Quantity sold	Revenue
	April	24	₹ 4,880.00
	May	25	₹ 5,339.00
	June	43	₹ 9,105.00
	July	24	₹ 5,205.00



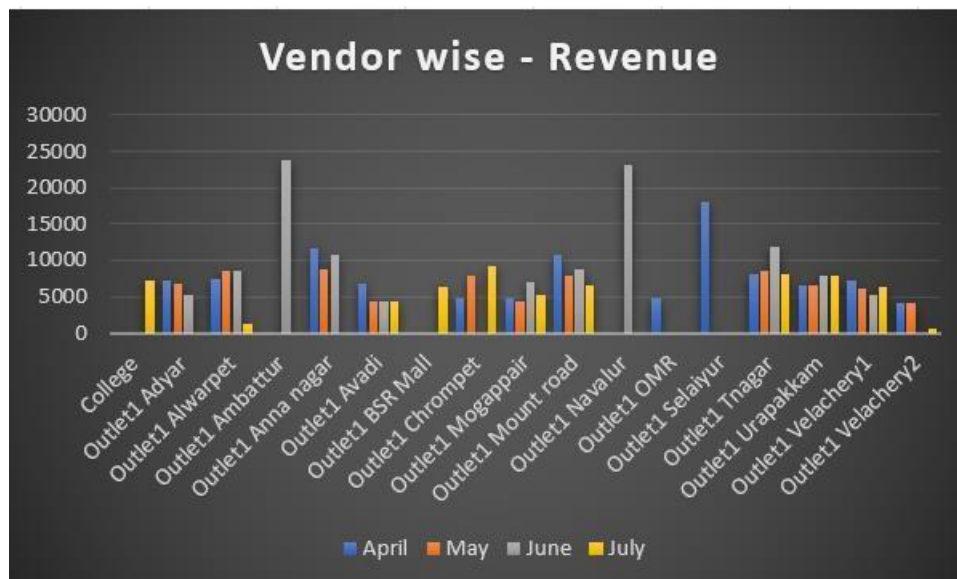
	Stationery products	ST04	Best wishes Card
	Month	Quantity sold	Revenue
	April	400	₹ 192.00
	May	350	₹ 244.00
	June	450	₹ 216.00
	July	500	₹ 240.00



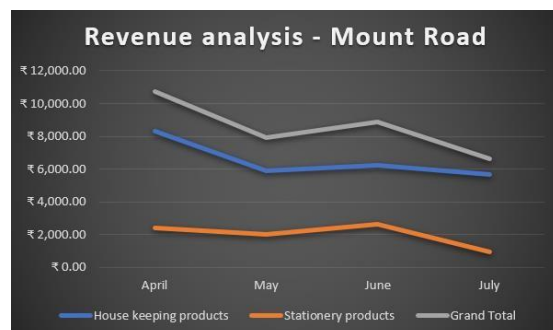
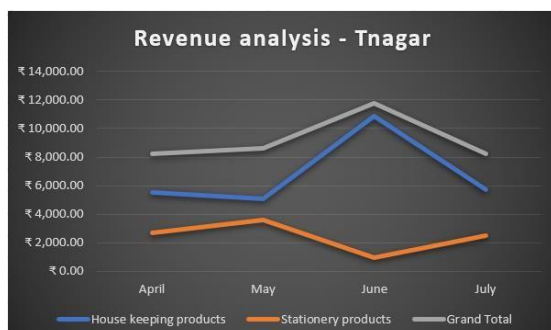
Vendor wise revenue analysis:

The outlet1 has many branches in the city of Chennai and the Vendor wise analysis is performed to know which Vendor buys the most.



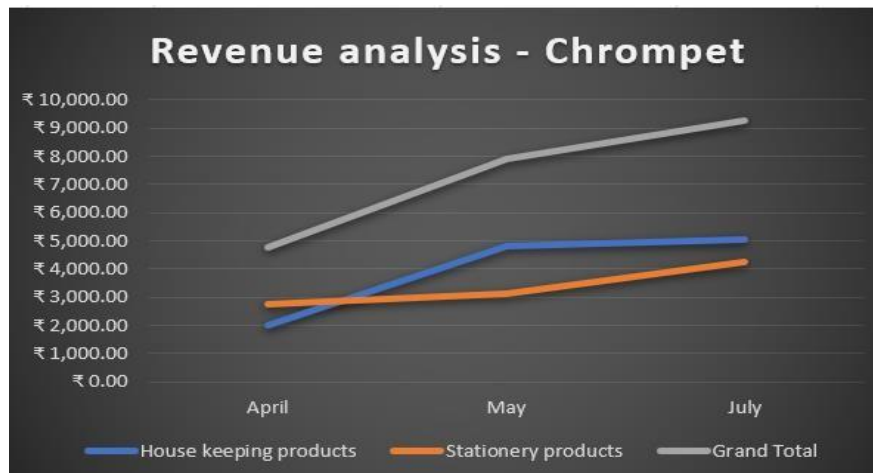


The outlet branches in Tnagar, Mount road buys more products than the other outlet branches. These are in the middle of the city and it has a big business space, guessing that the number of workers is more. So, the usage of the products will be high and hence these outlets are providing more revenue to our Business.



The below chart shows the revenue growth in the Chrompet branch. From this we can also say that the actual business growth of the Chrompet branch is increasing which leads them to buy

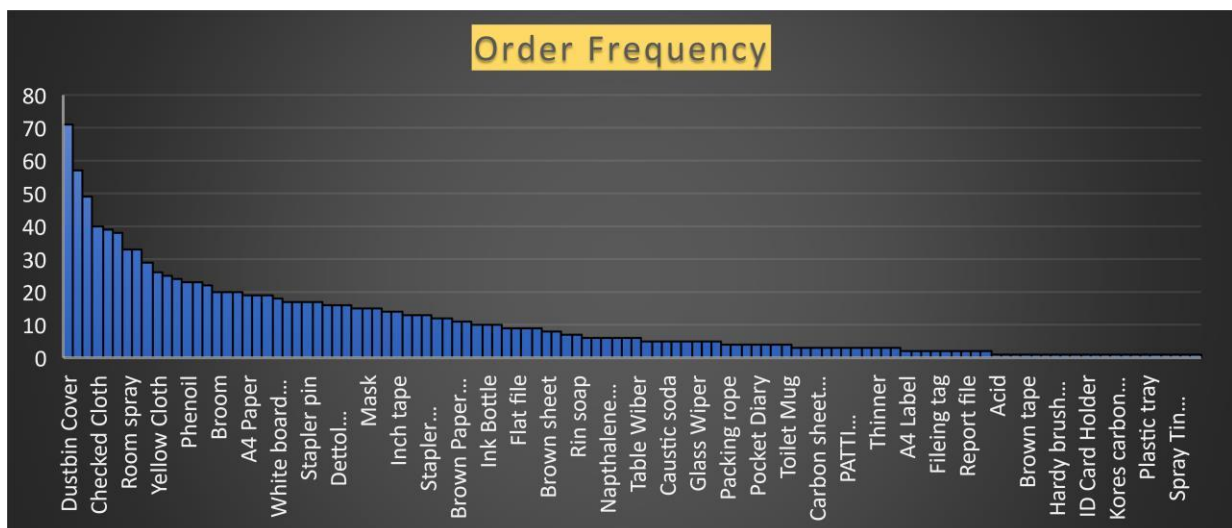
more products from Taanushree enterprises. This can be considered as Win-Win situation as if their business increases, the business of our Enterprise will also increase.



The branch Selaiyur has not placed any order after April and this should be addressed by the Business owner. The Branches Navalur and Nungambakkam has recently placed order in the month of July which is a positive sign of the business growth.

Order Frequency:

From 114 products, 23 products are frequently ordered products and some products are categorised as one-time ordered products. The below chart will be used to manage the inventory.







One-time ordered products	Frequently ordered products	Combo products
Tape dispenser machine	Dustbin Cover	Vim bar Soap - Scotch bright - Steel scrub - Dishwash liquid
Stapler pin remover	Floor Cleaner	White board - white board markers - White board Duster
Stapler Machine	Cello Tape	Patti crimbling machine - Packing rope - Packing strap -Knife
Spray Tin-Dispenser	Pen	Spray Tin dispenser - Spray bottle
Punching Machine	Checked Cloth	Stapler machine - Stapler pin - Stapler pin removal
Patti crimbling machine	Mop refill	Tape dispenser machine - Cello tape - Scissor
Packing Strap	Vim Bar Soap	Broom - Dustpan
Packing rope	Room spray	Bucket - Toilet mug

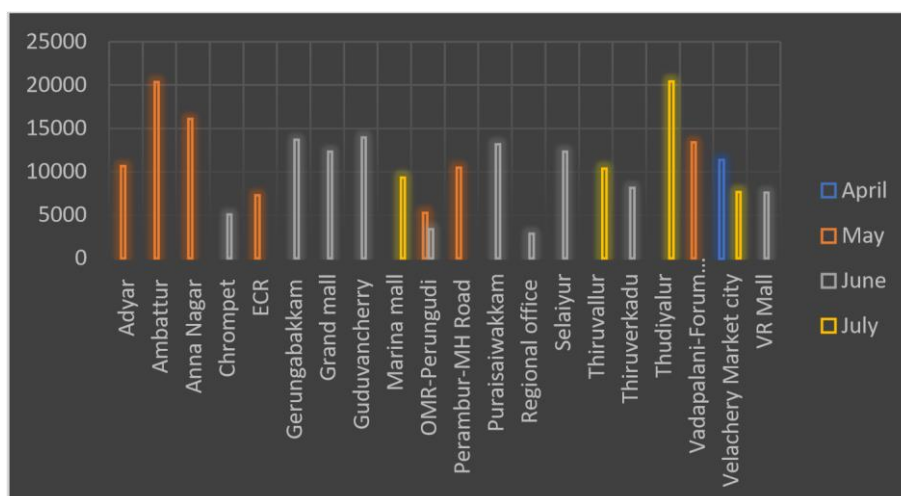
Analysis for Outlet 2:

The bills generated (shown in below fig) for outlet-2 does not have the details of the products sold, the owner also didn't maintain the product details sold for outlet-2 properly.

Tax Invoice							
S.No	Store Location	Store Code	GST%	Amount			REMARKS
1			5%	140			
2			12%	1766			
3			18%	9440.4			
GST %	Taxable Amount	CGST%	Amount	SGST%	Amount	11346.40	Gross Amount
5%	140	2.5%	3.50	2.5%	3.50	0.00	Disc Amt
12%	1766	6.0%	105.96	6.0%	105.96	0.00	Non Tax Amt
18%	9440.40	9.0%	849.64	9.0%	849.64	959.10	CGST
TOTAL	11346.4		959.10		959.10	959.10	SGST
Net Amount (In Words):Thirteen thousand two hundred and sixty five only.						13265	Net Amount

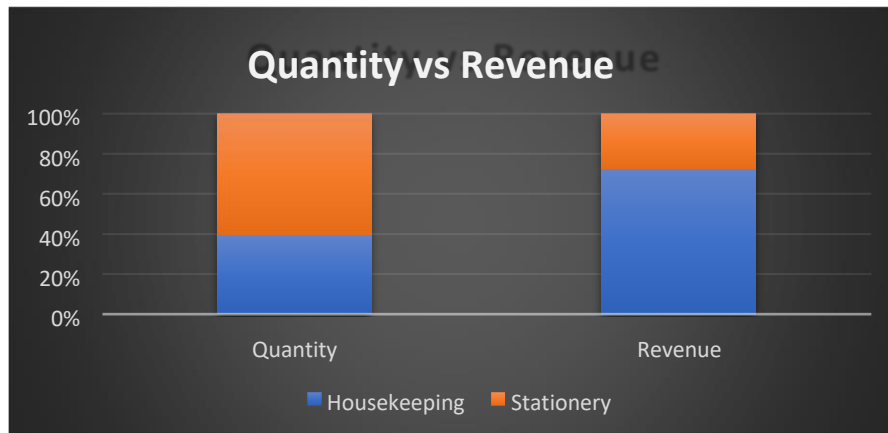
With the bills provided, we have made the following analysis.

- June month has generated higher revenue as many other branches of outlet-2 also has placed their buying orders.
- The Enterprise has also started to extend their business by delivering products to another city Coimbatore in the month of July. This is a positive sign of their growth.



### Quantity vs Revenue analysis:

The quantity of items sold on housekeeping products is comparatively low but generated more revenue compared to stationery products.



### Interpretation of the Results:

- 1) Taanushree enterprises has newly launched the services of delivering the housekeeping products and stationery products to other Business. Even though these services are newly launched, the revenue generated by these services are considerably higher than the already available transport services and can water delivery services.
- 2) From the ABC analysis, the business owner should concentrate only on 20% of the products to generate 80% of the revenue as it is following the pareto principle.
- 3) Some of the products are selling more but yielding less revenue may cause inventory space problems.
- 4) As the Covid restrictions are laid down by the government and the fear of covid has gone from the people, buying rate of the top selling hygienic products such as Masks, hand wash, sanitisers etc are reduced comparatively.
- 5) From the vendor wise analysis, the company has started to get new clients in the month of July even in the other districts also which is a positive sign of growth.
- 6) We can categorise few products as one-time ordered products as they are long-lasting and mostly the vendors buy these products when they ordered for the first time.  
Examples: Crimbling machine, Tape dispenser machine, Spray dispenser, Sanitiser dispenser etc., The products also grouped together as Combo products as those are bought combinedly by the customers.

- 7) The transport services have ups and downs in their revenue curves for the past 4 months. The transport services of Taanushree enterprises should enhance the proper alignment in their business process to increase their client acquisition rate.
- 8) Currently, the enterprise has delivering can waters to only one Client in both Chennai and Coimbatore. Since we have many other customers for other services, we can try to expand our can water delivery services to those customers also.

## **Recommendations:**

- 1) Stay Organised: Keep accurate records of business finances. Record every transaction (customer billings and vendor payments) into the proper account at least once weekly and keep an eye on the bottom line.
- 2) Focus to increase the Client acquisition rate:  
Taanushree enterprises have different Clients for their different services. Merging your marketing and customer service across all clients will enhance the company growth.
- 3) Strategically manage the inventory space by stocking up the products based on the identified categories (best/worst revenue generating products, one-time ordered products, frequently buying products, combo products) . By this way, we can save 20% inventory space.
- 4) Expand the business through online/web platforms. Reach customers in more ways than one.
- 5) Focus on order-to-delivery lead time and plan ahead to reduce the same.

The main objectives of the business analysis are to identify solutions for the following questions which is already stated in the proposal document. Hopefully our findings should help the business owners to get the answers for his questions.

1. What should be our #1 focus right now? As the firm is handling multiple streams of products, the management team wants to what areas should they invest in and in what areas they should divest.

Findings: The Enterprise should focus particularly to increase the Client acquisition rate by merging all of its customers to avail all their services.

2. To predict whether or not there were actually any patterns to capitalize on.

Findings: Actually, the trends show many patterns and the revenue curves are declining. With the help of those trends and analysis, the Owner can enhance the revenues which will make the curves sloping upwards.