Project Title: Supply Chain Management

Domain: Business Analyst

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Project overview:

Supply Chain Management is focused on managing the chain for supplying of Makeup products which are mainly focused on three types of product categorised as skincare, cosmetics and haircare. This project help to monitor and optimize various aspects of the supply chain, including inventory levels, order fulfilment , supplier performance, transportation efficiency, and overall supply chain costs.

Objective of the project:

- Revenue generated by types of product.
- Order quantity and location wise revenue generated.
- Product type and SKU wise order quantity and their stockout risks.
- Top 10 products and SKU generating highest profit.
- Top 10 products and SKU which have highest manufacturing costs.
- Top 10products and SKU which have high price.
- Average shipping cost by the mode of transportation.
- Average lead time and shipping costs for the supplier for taking the different routes.
- Supplier wise manufacturing lead time and defect rates.

Data source:

The “supply_chain_data” contains Product Type, SKU, Price, Availability, Number of products sold , Revenue generated, Customer demographics, Stock levels, Lead times, Order quantities, Shipping times, Shipping carriers, Shipping costs, Supplier name, Location, Lead time, Production volumes, Manufacturing lead time, Manufacturing costs, Inspection results, Defect rates, Transportation modes, Routes, Costs column to prepare the dashboard.

Data Transformation:

From the mentioned dataset two new column Stockout Risk and profit column is added to create a meaningful dashboard to support the analysis .

If order quantity is higher than available quantity then stockout risk is high else moderate .

Profit is determined form cost –(manufacturing cost +shipping cost).

Dashboard Design:

Tableau creates a meaningful visualisation for the supply chain management analysis.

Home:

- Revenue generated by product types.
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- Order quantity and location wise revenue generated.
- Product type and SKU wise order quantity and their stockout risks.
- Top 10 products and SKU generating highest profit.
- Top 10 products and SKU which have highest manufacturing costs.
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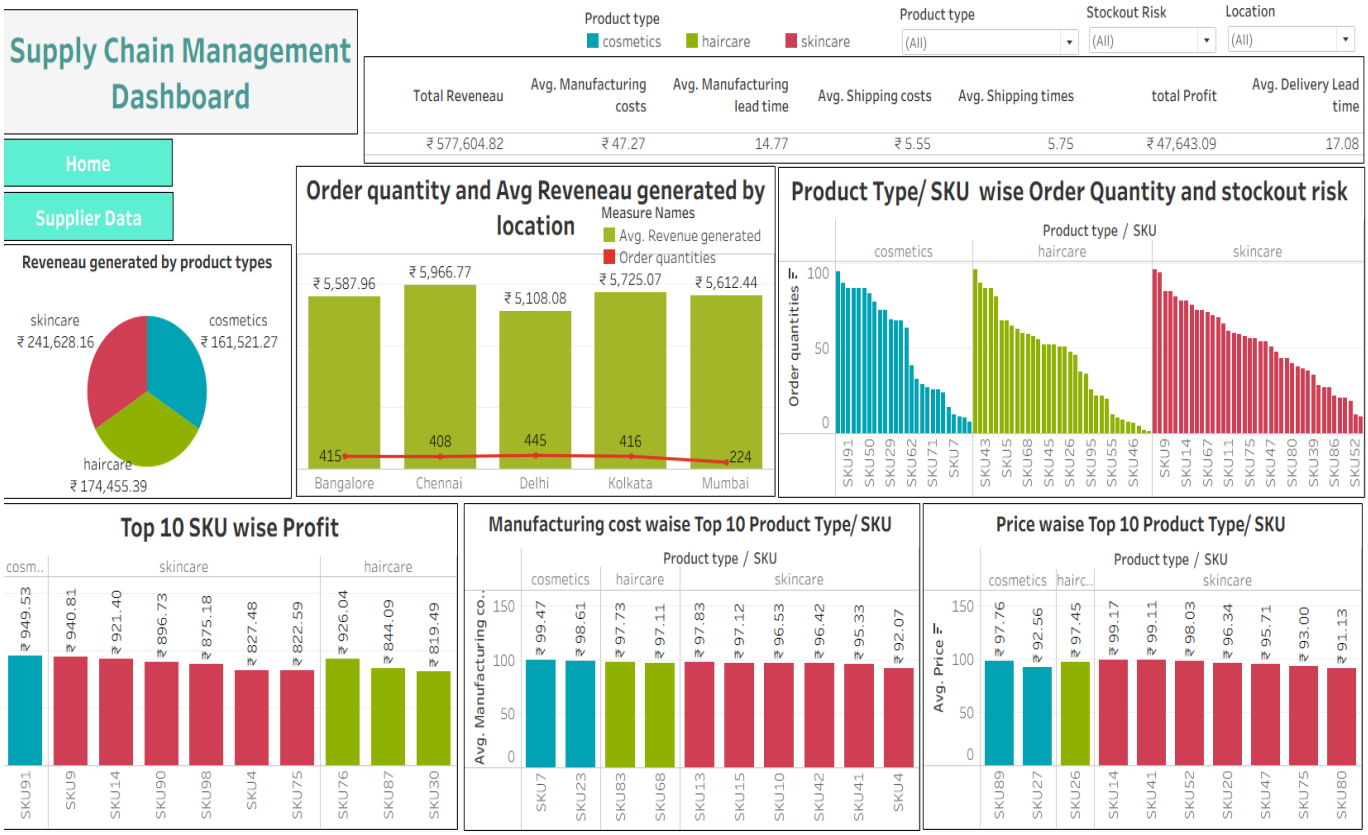
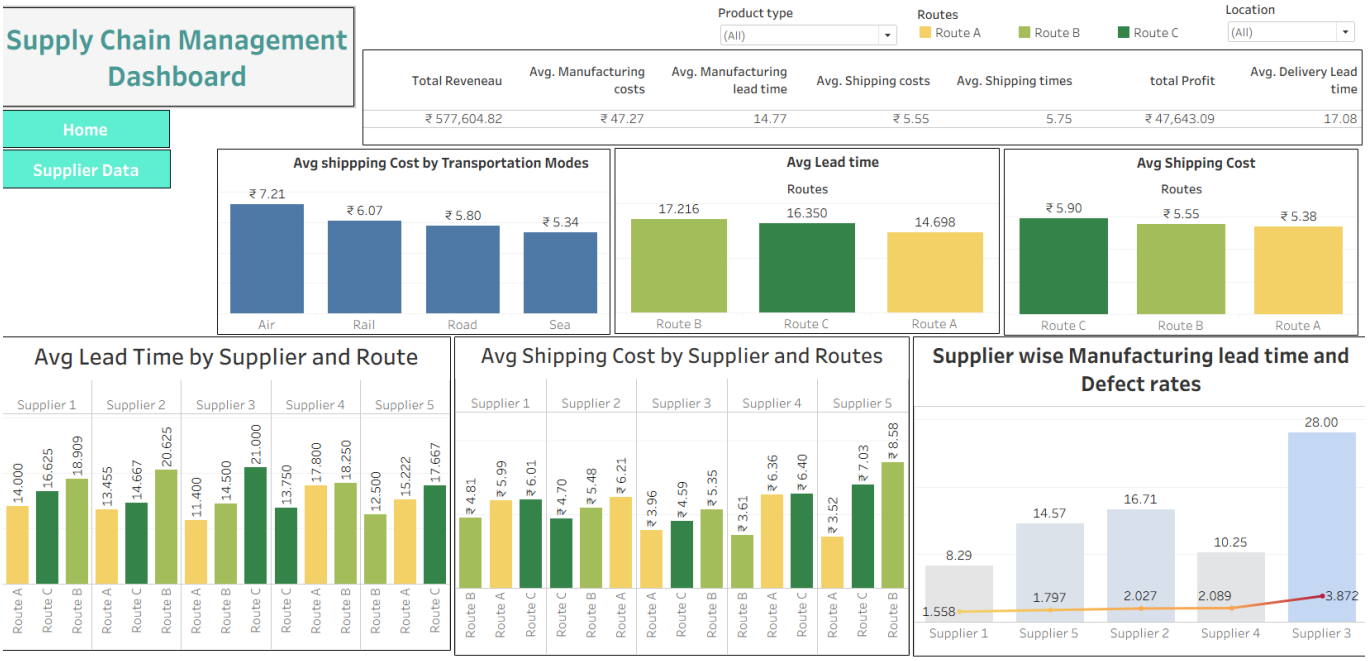


Supplier Data:

- Average shipping cost by the mode of transportation.
- Average lead time and shipping costs for the supplier for taking the different routes.
- Supplier wise manufacturing lead time and defect rates.
- Average lead time by Supplier and Routes.
- Average shipping costs by Supplier and Routes.



Data Storytelling:

Measure Names:

Metrics	Value
Total revenue	Rs.577604.82
Average manufacturing cost	Rs.47.27
Average manufacturing lead time	14.77 days
Average shipping costs	Rs.5.55
Average shipping time	5.75 days
Total profit	Rs.47643.09
Average delivery lead time	17.08 days

Attribute	Insight
Order Quantity and Average Revenue generated by location	Chennai have the **highest** average revenue of **Rs.5966.77/-** and Delhi have the **highest** order quantity of **445**.
Revenue generated by product types	**Skincare** product have generated **Rs.241628.16/-, Cosmetics** product have generated **Rs.161521.27/-** and **haircare** product have generated **Rs.174455.39/-.**
Product type/ SKU wise order quantity and stockout risk	For **cosmetics product SKU33** have the highest order quantity of **95** , for **haircare** product **SKU0** have the highest order quantity of **96**, for skincare **SKU90** have order quantity of **96**.

	Considering the **highest stockout risk** for cosmetics product **SKU33** having the highest order quantity of **95** have the highest risk of stockout followed by **SKU0** for haircare product and **SKU90** for skincare product . Considering **moderate risk** , for cosmetics product **SKU91** having order quantity of **85** ,for haircare product **SKU84** having order quantity of **80**, for skincare product **SKU19** having order quantity of **94** have moderate risk of stockout.
Top 10 SKU wise profit	For cosmetics product **SKU91** have **the highest profit** of **Rs.949.53/-,** for skincare product SKU9 have the highest profit of **Rs.940.81/-** followed by **SKU14,SKU90,SKU98,SKU4,SKU75**; for haircare product **SKU76** have the highest profit of **Rs.926.04/-** followed by **SKU87,SKU30**. So we can conclude skincare product have the highest no of SKUs generating the profit.
Manufacturing cost wise top 10 product type / SKU	For **cosmetics product SKU7** have the **highest cost for manufacturing** i.e **Rs.99.47/-** followed by **SKU23** which have manufacturing cost of **Rs.98.61/- ;** for **haircare** product **SKU83** have the highest cost for manufacturing i.e **Rs.97.73/-** followed by **SKU68** which have the manufacturing cost of **Rs.97.11/-;** for **skincare** product **SKU13** have the highest cost of manufacturing i.e **Rs.97.83/-** followed by **SKU15, SKU10,SKU42, SKU 41, SKU4.** So we can conclude that skincare product have the highest no of SKUs which have the highest manufacturing costs.
Price wise top 10 product type/ SKU	For **cosmetics** product **SKU89** have the **highest price** of **Rs.97.76/-** following by **SKU27** which have price of **Rs.92.56/-**; for **haircare product SKU26** have the highest price of **Rs.97.45/-**; for **Skincare** product **SKU14** have the highest price of **Rs.99.17/-** followed by **SKU41,SKU52, SKU 20, SKU47,SKU75,SKU80.** So we can conclude that skincare product have the highest no of SKUs which have the high price.

Attribute	Insight
Average shipping cost by transportation mode	**Air** have the **highest** cost or **Rs.7.21/-** for shipping followed by **Rail** i.e **Rs.6.07/-, Road** i.e **Rs.5.80/-, Sea** ie **Rs.5.34/-.**

Average lead time	**Route B** have the highest average lead time of **17.216** days followed by **Route C** which have average lead time of **16.350** days and **Route A** which have average lead time of **14.698** days.
Average shipping cost	**Route C** have highest shipping cost of **Rs5.90/-** as compared to **Route B** which have shipping cost of **Rs.5.55/-** and **Route A** which have shipping cost of **Rs. 5.38/-.**
Average lead time by supplier and route	For **Supplier 1 Route B** is taking the **18.909** days the **longest** as compared to **Route C** which is taking **16.625** days and **Route A** which his taking **lowest** of all i.e only **14** days. For **Supplier 2 Route A** is taking the **lowest** i.e only **13.455 days** as compared to **Route C** which is taking **14.667 days** and **Route B** which is taking **20.625 days.** For **Supplier 3 Route A** is taking the **lowest** i.e only **11.40 days** as compared to **Route B** which is taking **14.50 days** and **route C** which is taking **21 days.** For **Supplier 4 Route C** is taking the **lowest** i.e **only 13.75 days** as compared to **Route A** which is taking **17.80 days** and **Route B** which is taking **18.25 days.** For **Supplier 5 Route B** is taking the **lowest** i.e only **12.50 days** as compared to **Route A** which is taking **15.222 days** and **Route C** which is taking **17.667 days.**
Average Shipping cost by Supplier and routes	For Supplier 1 Route B have the lowest cost of Rs.4.81/- as compared to Route A which have cost of Rs.5.99/- and Route C which have cost of Rs. 6.01/-. For Supplier 2 Route C have the lowest cost of Rs.4.70/- as compared to Route B which have cost of Rs.5.48/- and Route A which have cost of Rs.6.21/-. For Supplier 3 Route A have the lowest cost of Rs.3.96/- as compared to Route C which have cost of Rs. 4.59/- and Route B which have cost of Rs.5.35/-.

	For Supplier 4 Route B have the lowest cost of Rs.3.61/- as compared to Route A which have cost of Rs. 6.36/- and Route C which have cost of Rs.6.40/-. For Supplier 5 Route A have the lowest cost of Rs.3.52/- as compared to Route C which have cost of Rs.7.03/- and Route B which have cost of Rs.8.58/-.
Supplier wise manufacturing lead time and defect rates	Supplier 3 have the highest average manufacturing lead time of 28 days and also the highest average defect rate of 3.872. While the Supplier 1 have the lowest average manufacturing lead time of 8.29 days and lowest average defect rate of 1.558.

Reporting and Deliverable:

The final report delivered to the client contains.

- Interactive tableau dashboard.
- Documents detailing prepared dataset , insights and decision .
- Dataset with calculated metrics.

Key Takeaways:

From the interactive dashboard we can enhance customer satisfaction by providing quicker lead time and efficient processing which will ensure timely deliveries .By understanding cost distributing which will help in better budgeting and resource allocation .Insights from data allows strategic decision which will ultimately grow the overall revenue.