

## Dataset Link

[manufacturing\\_data.csv](#)

## Objective

The purpose of this dataset is to analyze the end-to-end manufacturing process for various products, evaluating factors such as cost, time efficiency, supplier performance, and profitability to inform strategic supply chain decisions.

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## Dataset Fields

Column Name	Data Type	Description
Product type	String	Category of the product, e.g., Haircare, Skincare.
SKU	String	Unique Stock Keeping Unit for each product.
Price	Float	Selling price per unit of the product.
Availability	Integer	Number of units available at the store or warehouse.
Number of products sold	Integer	Total units sold during the observed period.
Revenue generated	Float	Total revenue = Price × Units Sold.
Customer demographics	String	Demographic information about buyers (Male, Female, Non-binary, Unknown).
Stock levels	Integer	Current inventory levels.
Lead times	Integer	Days taken from order to arrival of goods.
Order quantities	Integer	Units ordered from supplier.
Shipping times	Integer	Time taken for product shipment (days).
Shipping carriers	String	Name of shipping carrier (e.g., Carrier A, B).
Shipping costs	Float	Shipping cost per order/unit.

Supplier name	String	Name of the supplier.
Location	String	Geographic location of the supplier.
Lead time	Integer	Supplier-specific delivery lead time.
Production volumes	Integer	Total units manufactured in the cycle.
Manufacturing lead time	Integer	Days required to manufacture the product.
Manufacturing costs	Float	Cost to manufacture one unit of the product.
Inspection results	String	Result of quality inspection ( <b>Pending</b> , <b>Pass</b> , <b>Fail</b> ).
Defect rates	Float (0-1)	Proportion of defective items in manufacturing.
Transportation modes	String	Mode of transport used (e.g., <b>Road</b> , <b>Air</b> ).
Routes	String	Route identifier used for logistics.
Costs	Float	Transportation cost associated with the route.

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## Key Calculated Metrics

### 1. Total Lead Time

**Lead time + Manufacturing lead time**

➤ Represents end-to-end time taken from order to availability.

### 2. Profit per Unit

**Price - Manufacturing costs**

➤ Reflects direct unit-level profit before logistics, marketing, etc.

### 3. Profit Margin (%)

**$(\text{Profit per Unit} / \text{Price}) \times 100$**

➤ Indicates pricing efficiency relative to manufacturing cost.

#### 4. Efficiency Score

$\text{Production volumes} / \text{Total Lead Time}$

➤ Measures productivity; higher values indicate more efficient production.

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#### Use Cases

- Identifying inefficient SKUs and suppliers.
- Improving cost margins through optimal shipping or supplier choice.
- Predicting stockout risks by correlating lead times and demand.
- Prioritizing high-efficiency products for promotional campaigns.

Google Collab: [Manufacturing Analysis](#)