Project Graduation

DEPI_1_BNS1_DAT1_G1d

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Agenda:

1. Introduction
2. AdventureWorks Dataset Overview
3. Data Exploration with SQL
4. Data Cleaning
5. Production Schema Focus
6. Data Analysis & Insights
7. Dashboard Overview
8. Recommendations
9. Conclusion
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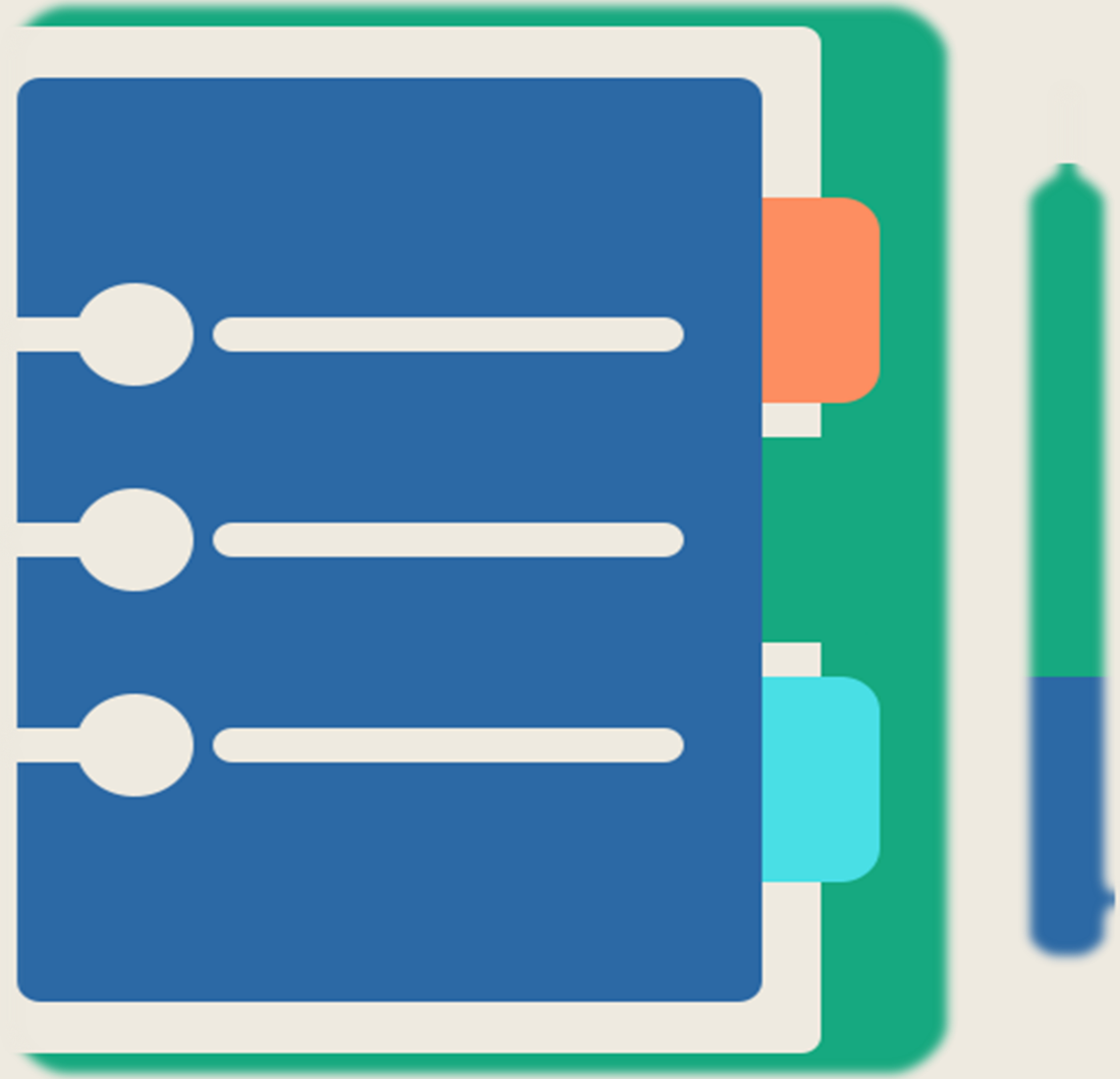


1. Intorduction:

- **The key objectives:** were to analyze production performance, identify potential inefficiencies, understand order processing, and track product purchasing. The aim was to develop actionable insights to enhance production planning and operational efficiency.
- **Tools Used:** The primary tools used were **SQL** for extracting and manipulating data, and **Power BI** for visualizing results and building the final dashboard.
- **Overview of Key Findings:** Some of the key findings that will be covered include delays in production, inefficiencies in component usage, and potential areas for improving work order processing .

2. AdventureWorks Dataset Overview:

AdventureWorks is a comprehensive database designed for a fictional company that manufactures and sells bicycles and other related products. The dataset contains various schemas, each representing different aspects of the business, such as sales, production, and purchasing. In this project, the focus was on the Production of Product and purchasing Schemas, which holds critical information about product manufacturing, including components, shipping, work orders, and routing sequences.

3. 1. Data Exploration with SQL:

- This query is designed to extract and analyze data from the production workflow, specifically focusing on work orders within a defined time frame. It pulls key details such as Product Name, Location, Order Quantity, and Resource Hours to gain insights into the production timeline. By comparing scheduled start and end dates with actual start and end dates, the query highlights delays in production processes, represented by Latency Days and Latency Hours.

- **Purpose of this query:** To evaluate how efficient the production was by identifying discrepancies between scheduled and actual timelines. It also includes scrap information to monitor how much product was discarded due to production issues. This analysis helps identify bottlenecks in the process, inefficiencies, and possible causes of delays, providing valuable insights for optimizing production workflows.

```sql
SELECT
    w.ProductID,
    p.Name,
    W.LocationID,
    L.Name AS LocationName,
    W.WorkOrderID,
    wo.OrderQty,
    pc.Name As ProductCategory,
    psc.Name As ProductSubCategory,
    w.ActualResourceHrs,
    W.ScheduledStartDate,
    YEAR(W.ScheduledStartDate) AS ScheduledStartYear,
    MONTH(W.ScheduledStartDate) AS ScheduledStartMonth,
    DAY(W.ScheduledStartDate) AS ScheduledStartDay,
    W.ActualStartDate,
    YEAR(W.ActualStartDate) AS ActualStartYear,
    MONTH(W.ActualStartDate) AS ActualStartMonth,
    DAY(W.ActualStartDate) AS ActualStartDay,
    W.ScheduledEndDate,
    YEAR(W.ScheduledEndDate) AS ScheduledEndYear,
    MONTH(W.ScheduledEndDate) AS ScheduledEndMonth,
    DAY(W.ScheduledEndDate) AS ScheduledEndDay,
    W.ActualEndDate,
    YEAR(W.ActualEndDate) AS ActualEndYear,
    MONTH(W.ActualEndDate) AS ActualEndMonth,
    DAY(W.ActualEndDate) AS ActualEndDay,
    DATEDIFF(DAY, W.ScheduledStartDate, W.ActualStartDate) AS LatencyStartDays,
    DATEDIFF(DAY, W.ScheduledEndDate, W.ActualEndDate) AS LatencyEndDays,
    DATEDIFF(DAY, W.ScheduledEndDate, W.ActualEndDate) - DATEDIFF(DAY, W.ScheduledStartDate, W.ActualStartDate) AS latencydates,
    (DATEDIFF(DAY, W.ScheduledEndDate, W.ActualEndDate) - DATEDIFF(DAY, W.ScheduledStartDate, W.ActualStartDate)) * w.ActualResourceHrs AS latencyHours,
    SR.Name AS scrappedName,
    wo.ScrappedQty
FROM
    Production.WorkOrderRouting AS W
JOIN
    Production.Product AS P ON W.ProductID = P.ProductID
JOIN
    Production.Location AS L ON W.LocationID = L.LocationID
JOIN
    Production.WorkOrder AS WO ON WO.WorkOrderID = w.WorkOrderID
JOIN
    Production.ScrapReason AS SR ON SR.ScrapReasonID = WO.ScrapReasonID
JOIN
    Production.ProductSubcategory AS psc ON p.ProductSubcategoryID = psc.ProductSubcategoryID
JOIN
    Production.ProductCategory AS pc ON psc.ProductCategoryID = pc.ProductCategoryID

WHERE
    W.ScheduledStartDate IS NOT NULL
    AND W.ActualEndDate IS NOT NULL
    -- تحديد الفترة الزمنية التي تريد حصرها بين التواريخ
    AND W.ScheduledStartDate > '2011-01-01'  -- استبدل بالتاريخ المناسب
    AND W.ActualEndDate < '2014-12-31';      -- استبدل بالتاريخ المناسب
```

3. 2. Data Exploration with SQL:

- This query is aimed at assessing the efficiency of the production process by analyzing the differences between scheduled and actual timelines for work orders. It retrieves details about products, locations, and work orders, and focuses on the actual resource hours used during production. By calculating the latency in both the start and end dates, the query identifies delays in the process.

- **Purpose of this query** : To track production delays and calculate their impact in terms of both time and resources. The latency days are calculated as the difference between scheduled and actual start and end dates. The latency hours metric multiplies the delay by the number of resource hours involved, giving a more comprehensive picture of the overall delay in production.

```sql
SELECT
    w.ProductID,
    p.Name,
    W.LocationID,
    L.Name AS LocationName,
    W.WorkOrderID ,
    w.ActualResourceHrs ,
    W.ScheduledStartDate,
    YEAR(W.ScheduledStartDate) AS ScheduledStartYear,
    MONTH(W.ScheduledStartDate) AS ScheduledStartMonth,
    DAY(W.ScheduledStartDate) AS ScheduledStartDay,
    W.ActualStartDate,
    YEAR(W.ActualStartDate) AS ActualStartYear,
    MONTH(W.ActualStartDate) AS ActualStartMonth,
    DAY(W.ActualStartDate) AS ActualStartDay,
    ScheduledEndDate,
    YEAR(W.ScheduledEndDate) AS ScheduledEndYear,
    MONTH(W.ScheduledEndDate) AS ScheduledEndMonth,
    DAY(W.ScheduledEndDate) AS ScheduledEndDay,
    W.ActualEndDate,
    YEAR(W.ActualEndDate) AS ActualEndYear,
    MONTH(W.ActualEndDate) AS ActualEndMonth,
    DAY(W.ActualEndDate) AS ActualEndDay,
    DATEDIFF(DAY, W.ScheduledStartDate, W.ActualStartDate) AS LatencyStartDays,
    DATEDIFF(Day, W.ScheduledEndDate, W.ActualEndDate) AS LatencyEndDays,
    DATEDIFF(Day, W.ScheduledEndDate, W.ActualEndDate)-DATEDIFF(DAY, W.ScheduledStartDate, W.ActualStartDate) as latencydates,
    (DATEDIFF(day, W.ScheduledEndDate, W.ActualEndDate)-DATEDIFF(day, W.ScheduledStartDate, W.ActualStartDate))*w.ActualResourceHrs as latencyHours

FROM
    Production.WorkOrderRouting as W
JOIN
    Production.Product as P ON W.ProductID = P.ProductID
JOIN
    production.Location as L ON W.LocationID = L.LocationID
WHERE
    W.ScheduledStartDate IS NOT NULL
    AND W.ActualEndDate IS NOT NULL
    -- تحديد الفترة الزمنية التي تريد حصرها بين التواريخ
    AND W.ScheduledStartDate > '2011-01-01'  -- استبدل بالتاريخ المناسب
    AND W.ActualEndDate < '2014-12-31'       -- استبدل بالتاريخ المناسب
```

3. 3. Data Exploration with SQL:

- This query is used to extract detailed information about products in the AdventureWorks database, including their categories, subcategories, and pricing details. The focus is on gaining an understanding of the product catalog, which can be useful for various types of analysis, such as inventory management, sales trends, and product performance.

- This query is valuable for generating insights into the product structure within the company and understanding how different product categories and subcategories are related. It helps management teams to:
  - Organize products by categories for better inventory tracking.
  - Monitor product pricing strategies.
  - Analyze the ratio of finished goods versus in-progress goods.

```sql
SELECT
    p.ProductID,
    p.Name AS ProductName,
    psc.Name AS SubCategoryName,
    pc.Name AS ProductCategory,
    p.ProductLine,
    p.ProductNumber,
    p.Class,
    p.StandardCost,
    p.ListPrice,
    p.MakeFlag,
    p.FinishedGoodsFlag
FROM
    Production.Product AS p
LEFT JOIN
    Production.ProductSubcategory AS psc ON p.ProductSubcategoryID = psc.ProductSubcategoryID
LEFT JOIN
    Production.ProductCategory AS pc ON psc.ProductCategoryID = pc.ProductCategoryID;
```

3. 4. Data Exploration with SQL:

- This SQL query retrieves comprehensive information regarding products from the database. The main objective is to extract details about each product, including its category and subcategory, which can aid in product analysis and inventory management.

- The primary goal of this query is to provide a structured overview of products, categorizing them into subcategories and categories. This information is crucial for various analyses, such as inventory management, sales performance evaluation, and strategic planning. By understanding the relationships and classifications of products, businesses can make informed decisions regarding stock levels, marketing strategies, and product development.

```sql
SELECT
    pod.PurchaseOrderID,
    p.BusinessEntityID,
    p.FirstName + ' ' + p.LastName AS EmployeeName,
    e.JobTitle,
    v.BusinessEntityID AS VendorBusinessEntityID,
    v.Name AS VendorName,
    sm.Name AS ShipMethodName,
    poh.OrderDate,
    YEAR(poh.OrderDate) AS OrderYear,
    MONTH(poh.OrderDate) AS OrderMonth,
    DAY(poh.OrderDate) AS OrderDay,
    poh.ShipDate,
    YEAR(poh.ShipDate) AS ShipYear,
    MONTH(poh.ShipDate) AS ShipMonth,
    DAY(poh.ShipDate) AS ShipDay,
    pod.DueDate,
    YEAR(pod.DueDate) AS DueYear,
    MONTH(pod.DueDate) AS DueMonth,
    DAY(pod.DueDate) AS DueDay,
    DATEDIFF(DAY, poh.ShipDate, pod.DueDate) AS shipped_dates,
    poh.SubTotal,
    poh.TaxAmt,
    poh.Freight,
    poh.TotalDue
FROM
    Purchasing.PurchaseOrderDetail AS pod
JOIN
    Purchasing.PurchaseOrderHeader AS poh ON pod.PurchaseOrderID = poh.PurchaseOrderID
JOIN
    Person.Person AS p ON poh.EmployeeID = p.BusinessEntityID
JOIN
    Purchasing.Vendor AS v ON poh.VendorID = v.BusinessEntityID
JOIN
    HumanResources.Employee AS e ON p.BusinessEntityID = e.BusinessEntityID
JOIN
    Purchasing.ShipMethod AS sm ON poh.ShipMethodID = sm.ShipMethodID
GROUP BY
    pod.PurchaseOrderID,
    p.BusinessEntityID,
    p.FirstName,
    p.LastName,
    e.JobTitle,
    v.BusinessEntityID,
    v.Name,
    sm.Name,
    poh.OrderDate,
    poh.ShipDate,
    pod.DueDate,
    poh.SubTotal,
    poh.TaxAmt,
    poh.Freight,
    poh.TotalDue
```

3. 5. Data Exploration with SQL:

- The main goal of this query is to provide a detailed breakdown of each purchase order, focusing on the quantities of items received, rejected, and stocked, along with their corresponding financial values. This information is valuable for inventory management, financial analysis, and understanding the efficiency of the purchasing process.
- By assessing the quantities and statuses of ordered products, businesses can identify potential issues in the supply chain, make informed decisions on stock management, and evaluate vendor performance. This data ultimately aids in optimizing procurement strategies and improving overall operational efficiency.

```sql
SELECT
    pod.PurchaseOrderID,
    pod.ProductID,
    pod.UnitPrice,
    pod.OrderQty,
    pod.LineTotal,
    pod.ReceivedQty,
    CASE
        WHEN pod.ReceivedQty > 0 THEN pod.ReceivedQty * pod.UnitPrice
        ELSE 0
    END AS ReceivedTotal,
    CASE
        WHEN pod.ReceivedQty > 0 THEN (pod.OrderQty - pod.ReceivedQty) * pod.UnitPrice
        ELSE 0
    END AS DifflineRec,
    pod.RejectedQty,
    CASE
        WHEN pod.RejectedQty > 0 THEN pod.RejectedQty * pod.UnitPrice
        ELSE 0
    END AS RejectedTotal,
    pod.StockedQty,
    CASE
        WHEN pod.StockedQty > 0 THEN pod.StockedQty * pod.UnitPrice
        ELSE 0
    END AS StockedTotal,
    CASE
        WHEN pod.StockedQty > 0 and pod.StockedQty != (pod.ReceivedQty-pod.RejectedQty) THEN (pod.ReceivedQty - pod.StockedQty) * pod.UnitPrice
        ELSE 0
    END AS DifflineStock,
    p.BusinessEntityID,
    p.FirstName + ' ' + p.LastName AS EmployeeName,
    v.BusinessEntityID,
    v.Name,
    e.JobTitle
FROM
    Purchasing.PurchaseOrderDetail AS pod
JOIN
    Purchasing.PurchaseOrderHeader AS poh ON pod.PurchaseOrderID = poh.PurchaseOrderID
JOIN
    Person.Person AS p ON poh.EmployeeID = p.BusinessEntityID
JOIN
    Purchasing.Vendor AS v ON poh.VendorID = v.BusinessEntityID
JOIN
    HumanResources.Employee AS e ON p.BusinessEntityID = e.BusinessEntityID;
```

3. 6. Data Exploration with SQL:

- The goal of this query is to provide a breakdown of the components used in product assemblies, including their names and whether they are made in-house or outsourced.

- The query also links each component to its corresponding product assembly (if applicable). This information is valuable for understanding the composition of products, analyzing the supply chain, and managing inventory.

- By identifying both components and assemblies, the company can make informed decisions about production, sourcing, and cost management.

```
SELECT
    BOM.ComponentID,
    P.Name AS ComponentName,
    P.MakeFlag,
    BOM.ProductAssemblyID,
    PL.Name AS ProductAssemblyName
FROM
    Production.BillOfMaterials AS BOM
JOIN
    Production.Product AS P ON P.ProductID = BOM.ComponentID
LEFT OUTER JOIN
    Production.Product AS PL ON PL.ProductID = BOM.ProductAssemblyID;
```

3. 7. Data Exploration with Excel:

- **The yellow-highlighted lines removed from the shipping query represent raw data. These lines contained direct data values that were irregular and duplicates, which were not needed for the final analysis, so they were excluded from the documentation to maintain accuracy and consistency.**

	PurchaseOrderID	BusinessEntityID	EmployeeName	JobTitle	VendorBusinessEntityID	VendorName	ShipMethodName	OrderDate	ShipDate	DueDate	shipped_dates	SubTotal	TaxAmt	Freight	Tota
3986	3985	257	Eric Kurjan	Buyer	1500	Morgan Bike Ac	XRQ - TRUCK GRO	8/3/2014	8/12/2014	8/17/2014	5	418.95	33.516	10.4738	46
3987	3986	261	Reinout Hillmann	Purchasing	1656	Mountain Works	OVERNIGHT J-FAS	8/3/2014	8/12/2014	8/17/2014	5	525.7665	42.0613	13.1442	5
3988	3987	251	Mikael Sandberg	Buyer	1572	National Bike As	XRQ - TRUCK GRO	8/3/2014	8/12/2014	8/17/2014	5	461.79	36.9432	11.5448	5
3989	3988	253	Linda Meisner	Buyer	1562	Norstan Bike Hu	OVERNIGHT J-FAS	8/3/2014	8/12/2014	8/17/2014	5	481.887	38.551	12.0472	53
3990	3989	252	Arvind Rao	Buyer	1662	Northern Bike T	ZY - EXPRESS	8/3/2014	8/12/2014	8/17/2014	5	37.0755	2.966	0.9269	4
3991	3990	256	Frank Pellow	Buyer	1682	Premier Sport, I	OVERNIGHT J-FAS	8/3/2014	8/12/2014	8/17/2014	5	21558.075	1724.646	538.9519	238
3992	3991	259	Ben Miller	Buyer	1686	Pro Sport Indus	OVERNIGHT J-FAS	8/3/2014	8/12/2014	8/17/2014	5	475.6815	38.0545	11.892	5
3993	3992	260	Annette Hill	Purchasing	1684	Professional Ath	CARGO TRANSPOR	8/3/2014	8/12/2014	8/17/2014	5	41048.7	3283.896	1026.218	453
3994	3993	258	Erin Hagens	Buyer	1534	Ready Rentals	CARGO TRANSPOR	8/3/2014	8/12/2014	8/17/2014	5	416.745	33.3396	10.4186	46
3995	3994	254	Fukiko Ogisu	Buyer	1614	Reliance Fitnes	CARGO TRANSPOR	8/3/2014	8/12/2014	8/17/2014	5	279.153	22.3322	6.9788	3
3996	3995	257	Eric Kurjan	Buyer	1588	Signature Cycle	CARGO TRANSPOR	8/3/2014	8/12/2014	8/17/2014	5	40471.2	3237.696	1011.78	447
3997	3996	261	Reinout Hillmann	Purchasing	1622	Speed Corporat	OVERNIGHT J-FAS	8/3/2014	8/12/2014	8/17/2014	5	389.655	31.1724	9.7414	43
3998	3997	251	Mikael Sandberg	Buyer	1632	Sport Fan Co.	CARGO TRANSPOR	8/3/2014	8/12/2014	8/17/2014	5	62092.8	4967.424	1552.32	686
3999	3998	253	Linda Meisner	Buyer	1608	Sport Playgrour	CARGO TRANSPOR	8/3/2014	8/12/2014	8/17/2014	5	5948.25	475.86	148.7063	657
4000	3999	255	Gordon Hee	Buyer	1576	Superior Bicycle	CARGO TRANSPOR	8/3/2014	8/12/2014	8/17/2014	5	91117.95	7289.436	2277.949	100
4001	4000	252	Arvind Rao	Buyer	1590	SUPERSALES I	XRQ - TRUCK GRO	8/3/2014	8/12/2014	8/17/2014	5	525	42	13.125	5
4002	4001	260	Annette Hill	Purchasing	1520	G & K Bicycle C	OVERSEAS - DELU	2/11/2014	3/8/2014	3/13/2014	5	4578.315	366.2652	91.5663	503
4003	4001	260	Annette Hill	Purchasing	1520	G & K Bicycle C	OVERSEAS - DELU	2/11/2014	3/8/2014	7/2/2014	116	4578.315	366.2652	91.5663	503
4004	4001	260	Annette Hill	Purchasing	1520	G & K Bicycle C	OVERSEAS - DELU	2/11/2014	3/8/2014	9/22/2014	198	4578.315	366.2652	91.5663	503
4005	4002	252	Arvind Rao	Buyer	1574	Jeff's Sporting C	OVERSEAS - DELU	9/22/2014	10/17/2014	10/22/2014	5	1020	81.6	20.4	
4006	4003	252	Arvind Rao	Buyer	1636	Integrated Sport	OVERSEAS - DELU	5/14/2014	6/8/2014	12/3/2013	-187	27453.6	2196.288	549.072	30
4007	4003	252	Arvind Rao	Buyer	1636	Integrated Sport	OVERSEAS - DELU	5/14/2014	6/8/2014	6/13/2014	5	27453.6	2196.288	549.072	30
4008	4004	252	Arvind Rao	Buyer	1636	Integrated Sport	OVERSEAS - DELU	11/3/2013	11/28/2013	12/3/2013	5	46383	3710.64	927.66	5
4009	4005	252	Arvind Rao	Buyer	1636	Integrated Sport	OVERSEAS - DELU	1/27/2014	2/21/2014	2/26/2014	5	7425	594	148.5	
4010	4006	256	Frank Pellow	Buyer	1518	International Tre	OVERSEAS - DELU	1/18/2014	2/12/2014	1/11/2014	-32	21882.5	1750.6	437.65	24
4011	4006	256	Frank Pellow	Buyer	1518	International Tre	OVERSEAS - DELU	1/18/2014	2/12/2014	2/17/2014	5	21882.5	1750.6	437.65	24
4012	4007	251	Mikael Sandberg	Buyer	1594	Fitness Associa	OVERSEAS - DELU	3/1/2014	3/26/2014	3/31/2014	5	554020	44321.6	11080.4	6
4013	4007	251	Mikael Sandberg	Buyer	1594	Fitness Associa	OVERSEAS - DELU	3/1/2014	3/26/2014	5/14/2014	49	554020	44321.6	11080.4	6
4014	4008	258	Erin Hagens	Buyer	1676	Team Athletic C	OVERSEAS - DELU	4/22/2014	5/17/2014	5/22/2014	5	396729	31738.32	7934.58	43
4015	4009	261	Reinout Hillmann	Purchasing	1546	Green Lake Bik	OVERSEAS - DELU	11/9/2013	12/4/2013	12/9/2013	5	14915	1193.2	298.3	1
4016	4010	260	Annette Hill	Purchasing	1574	Jeff's Sporting C	OVERSEAS - DELU	11/9/2013	12/4/2013	12/9/2013	5	37760	3020.8	755.2	
4017	4011	254	Fukiko Ogisu	Buyer	1546	Green Lake Bik	OVERSEAS - DELU	6/24/2014	7/19/2014	7/24/2014	5	54492.5	4359.4	1089.85	59
4018	4012	254	Fukiko Ogisu	Buyer	1636	Integrated Sport	OVERSEAS - DELU	6/24/2014	7/19/2014	7/24/2014	5	997680	79814.4	19953.6	10

4. Data cleaning by SQL:

- **Removing The goal here is to ensure that data maintains accuracy and consistency. By removing entries that don't align with expected shipping time, It useful to improving the reliability of dataset for further analysis. that don't align with expected shipping time.**

```
select * from Purchasing.PurchaseOrderDetail As pod
join Purchasing.PurchaseOrderHeader As poh on poh.PurchaseOrderID= pod.PurchaseOrderID
where DATEDIFF(DAY,poh.ShipDate,pod.DueDate) !=5



Delete
FROM Purchasing.PurchaseOrderDetail
WHERE PurchaseOrderID = 4007 AND DueDate = '2014-05-14'
```

108 %

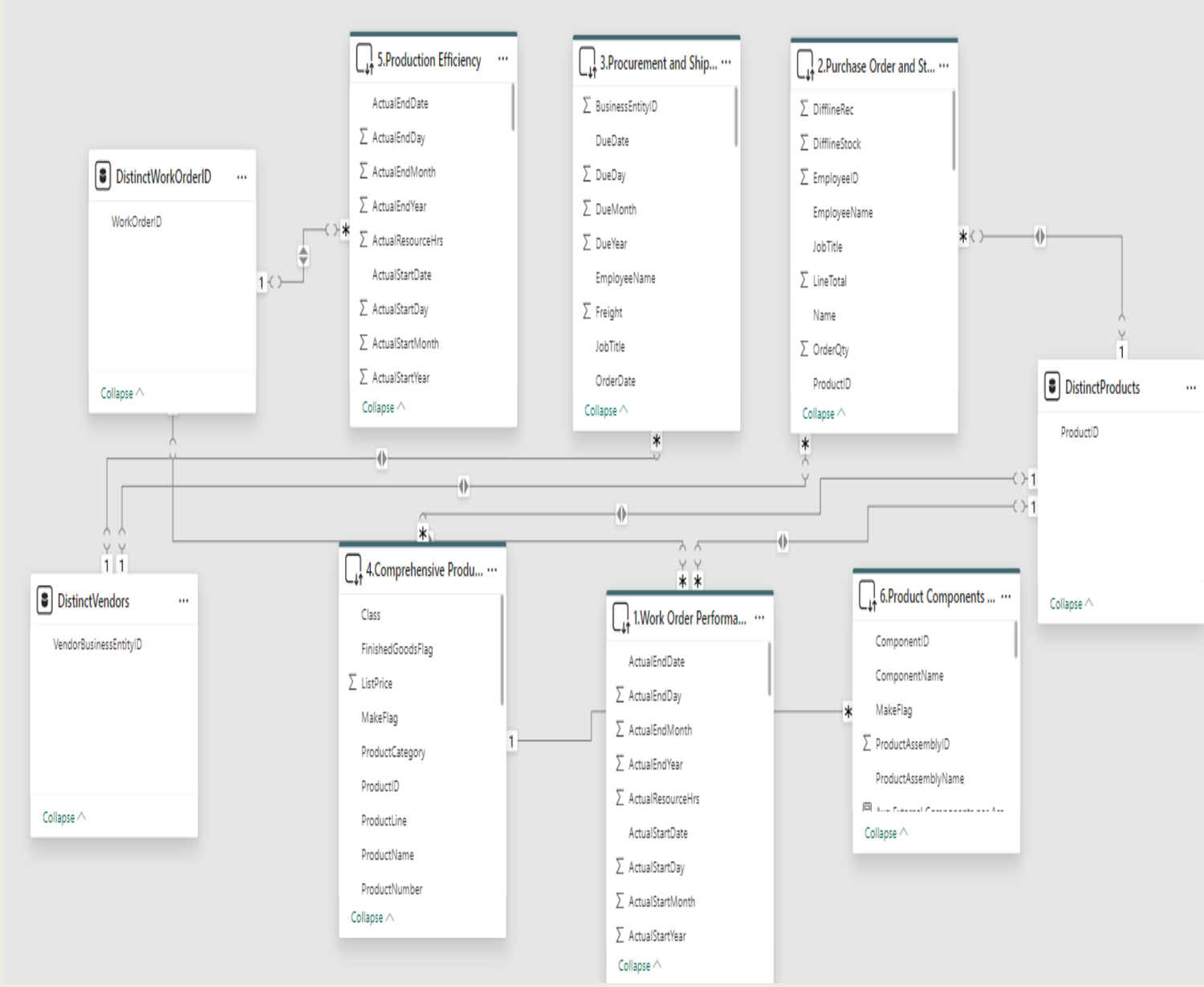
Messages

```
(6 rows affected)

Completion time: 2024-10-13T18:24:52.0151663+03:00
```

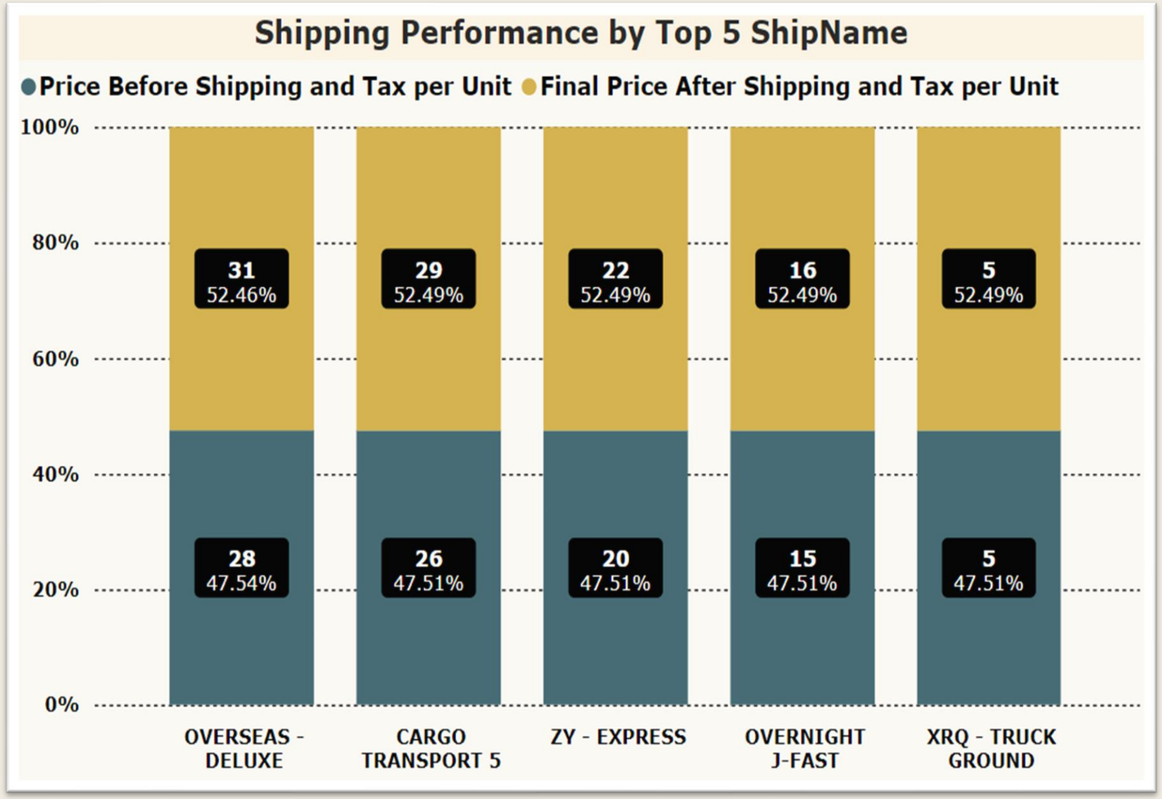
5. PROJECT Production , Purchasing Schema Focus:

This schema, built using Power BI, showcases the relationships between various tables essential for analyzing production efficiency in the AdventureWorks dataset. Key tables include Work Order Performance, Product Components, and Procurement and Shipping, all connected to analyze production timelines, component usage, and procurement efficiency. The relationships were designed to track the entire workflow, from procurement to production and stock management, ensuring comprehensive insights into the production process.



6.1. Data Analysis & Insights:

Q1: How does shipping performance vary by carrier?

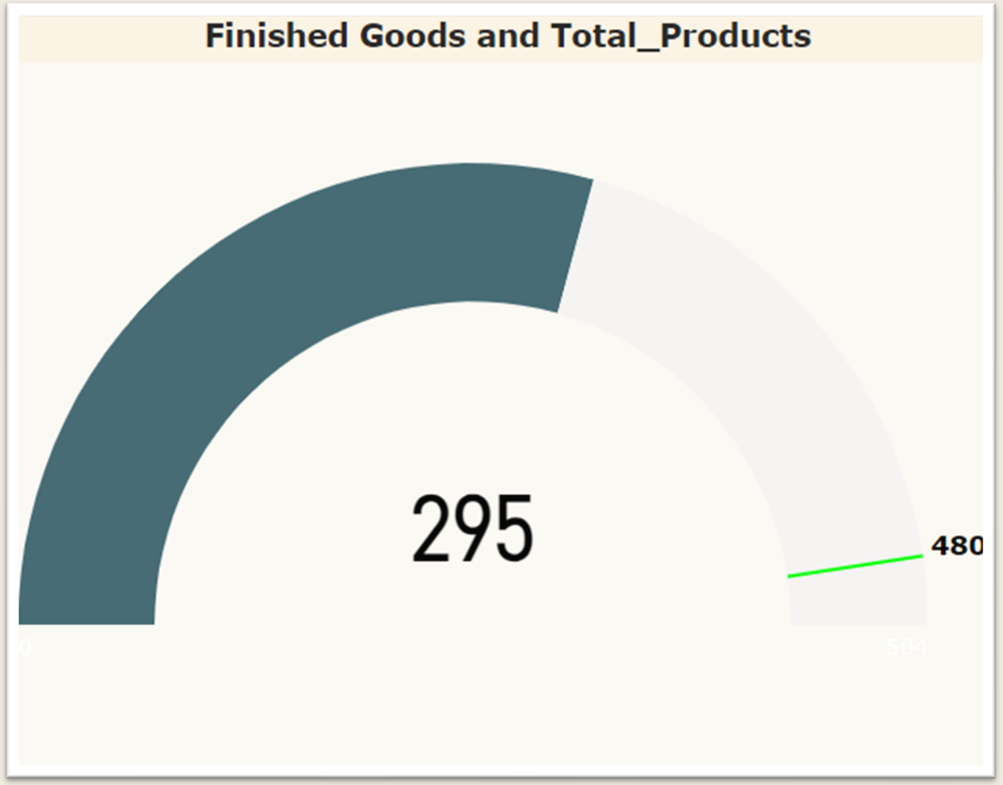


- Answer: The chart shows that different shipping companies have varied performances in terms of the percentage of total costs before and after shipping and tax. "OVERSEAS-DELUXE" and "CARGO TRANSPORT 5" account for 47.3% of the cost before and after shipping and tax.

- Investigate the reasons behind the cost variations for each shipping provider and identify opportunities to streamline shipping for cost savings.

6.2. Data Analysis & Insights:

Q2: How many finished goods are there?

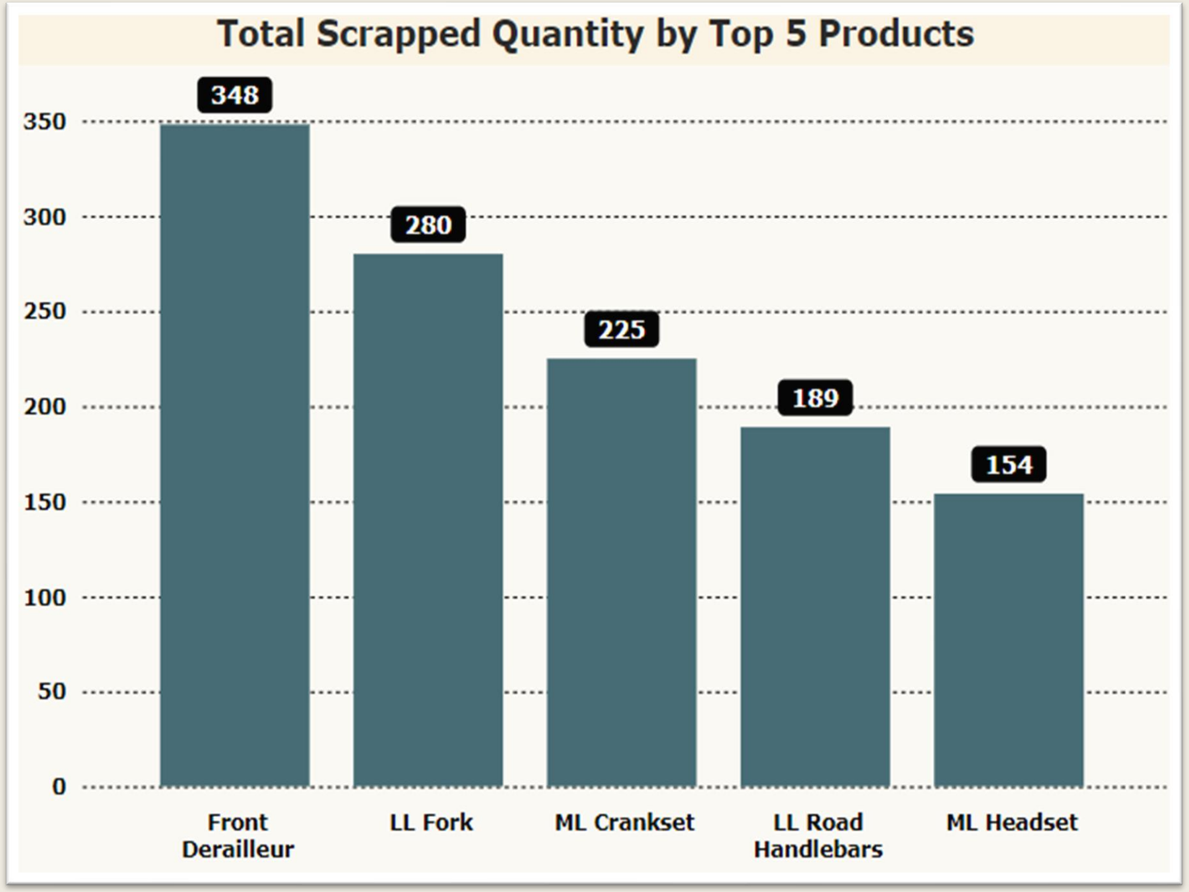


- **Answer: There are 295 finished goods compared to a total of 480 products.**

- **Investigate the gap between finished goods and total products to identify any delays or bottlenecks in the final stages of production.**

6.3. Data Analysis & Insights:

Q3: Which products have the highest scrapped quantities?



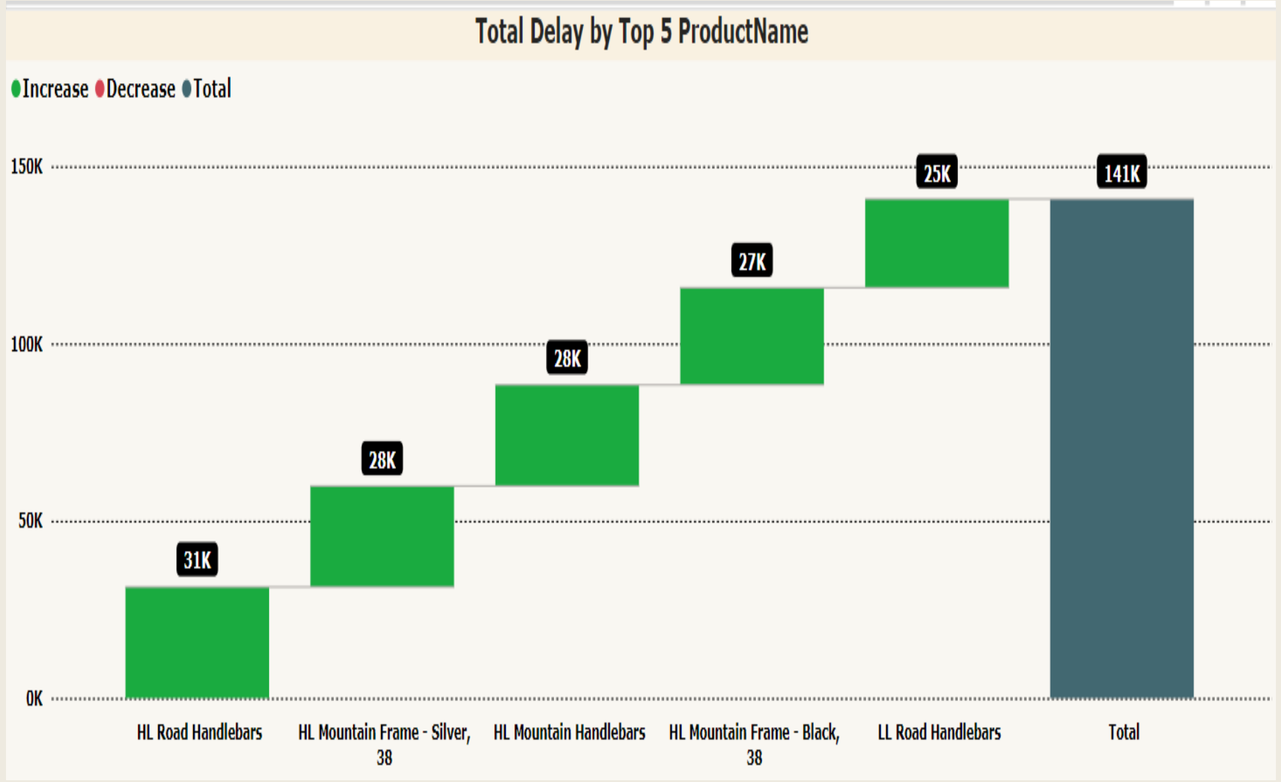
- **Answer: The "Front Derailleur" and "LL Fork" products have the highest scrapped quantities, with 348 and 280 units, respectively.**

- **Conduct a root cause analysis on the top scrapped products to improve product quality and reduce waste.**

6.4. Data Analysis & Insights:

Q4: Which products contribute the most to shipping delays?

- **Answer: "LL Road Handlebars" contribute the most to shipping delays with a total of 141K units delayed.**

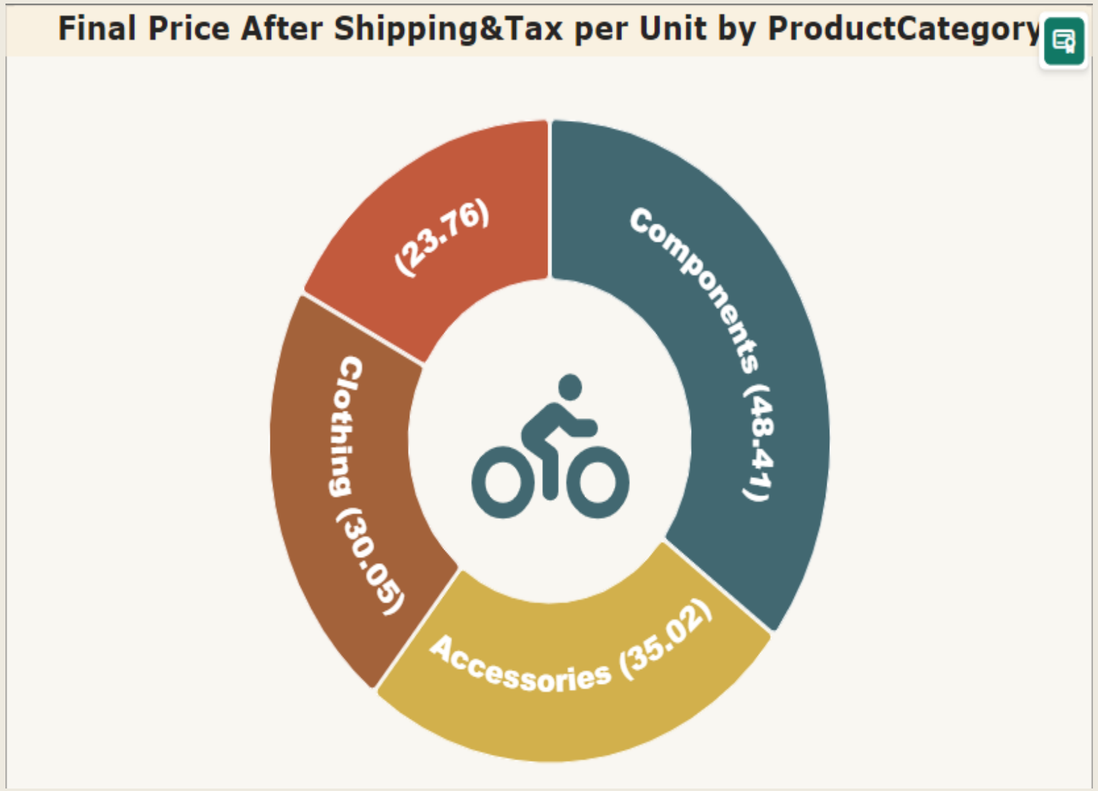


- **Focus on improving the supply chain for this product, as reducing delays could significantly enhance overall delivery performance.**

6.5. Data Analysis & Insights:

Q5: What is the final price per unit across product categories after shipping and tax?

- **Answer: The final price distribution shows significant costs across "Bicycles," "Components," and "Accessories," with a majority attributed to "Bicycles."**

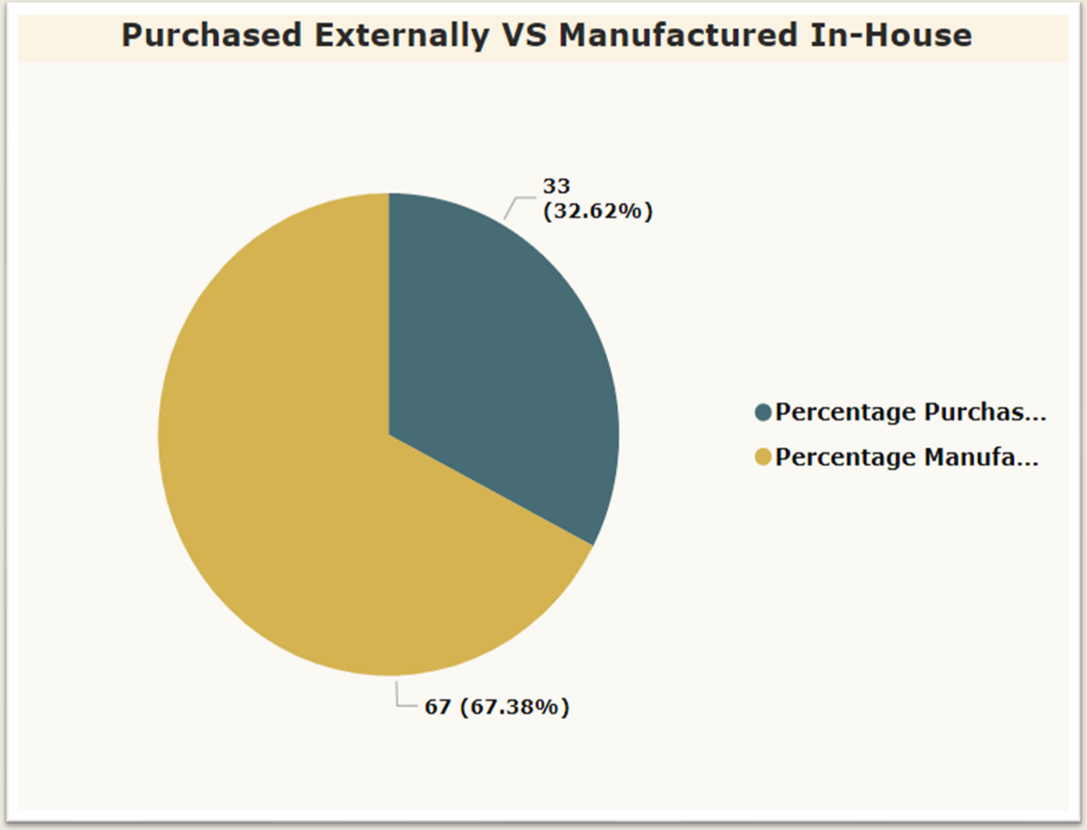


- **Review pricing strategies for product categories to ensure competitive pricing after factoring in shipping and taxes, especially for higher-cost items like bicycles.**

6.6. Data Analysis & Insights:

Q6: How is production divided between in-house manufacturing and external purchasing?

- **Answer: Approximately 67% of products are purchased externally, while 33% are manufactured in-house.**

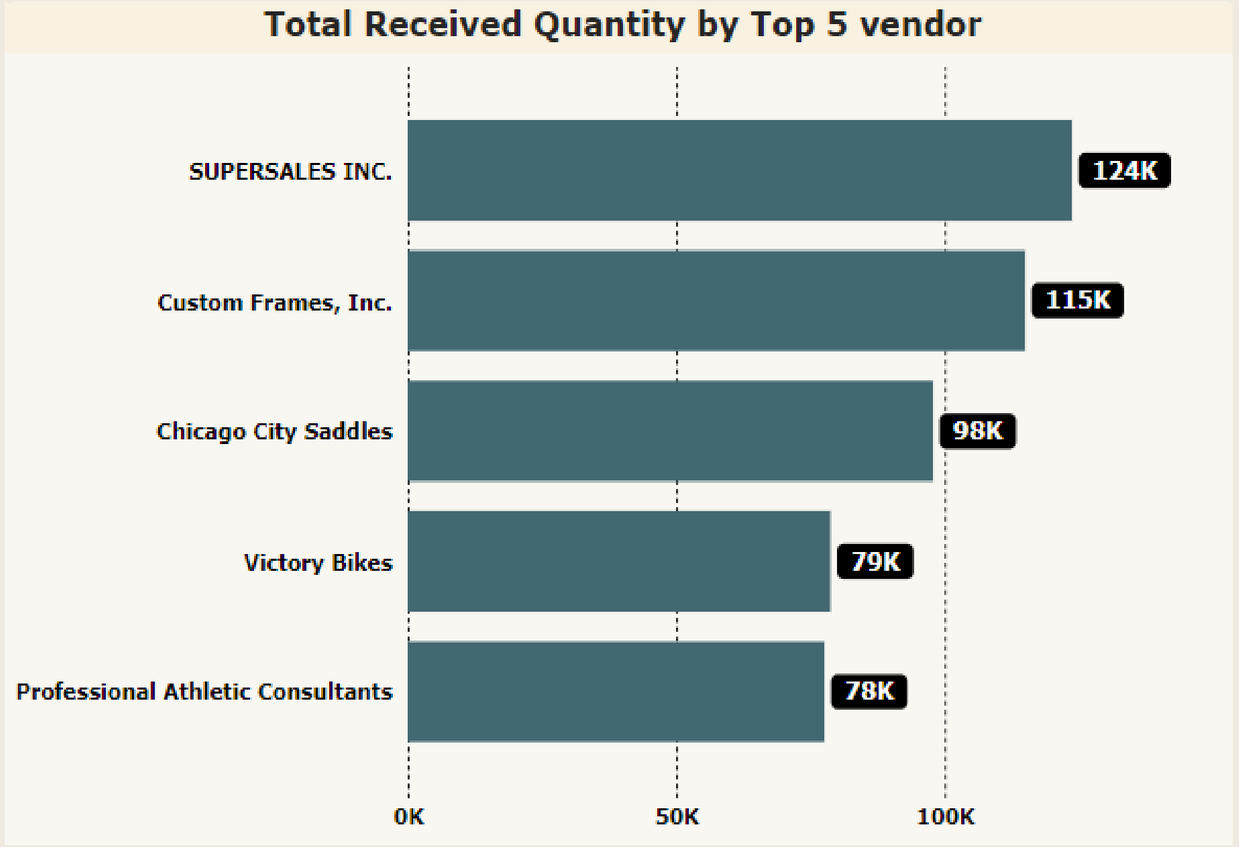


- **Assess whether increasing in-house production could reduce costs and improve quality control.**

6.7. Data Analysis & Insights:

Q7: Which vendors supply the highest quantities?

- **Answer: "SUPERSALES INC." supplies the most, with 124K units received, followed by "Custom Frames, Inc." with 115K units.**

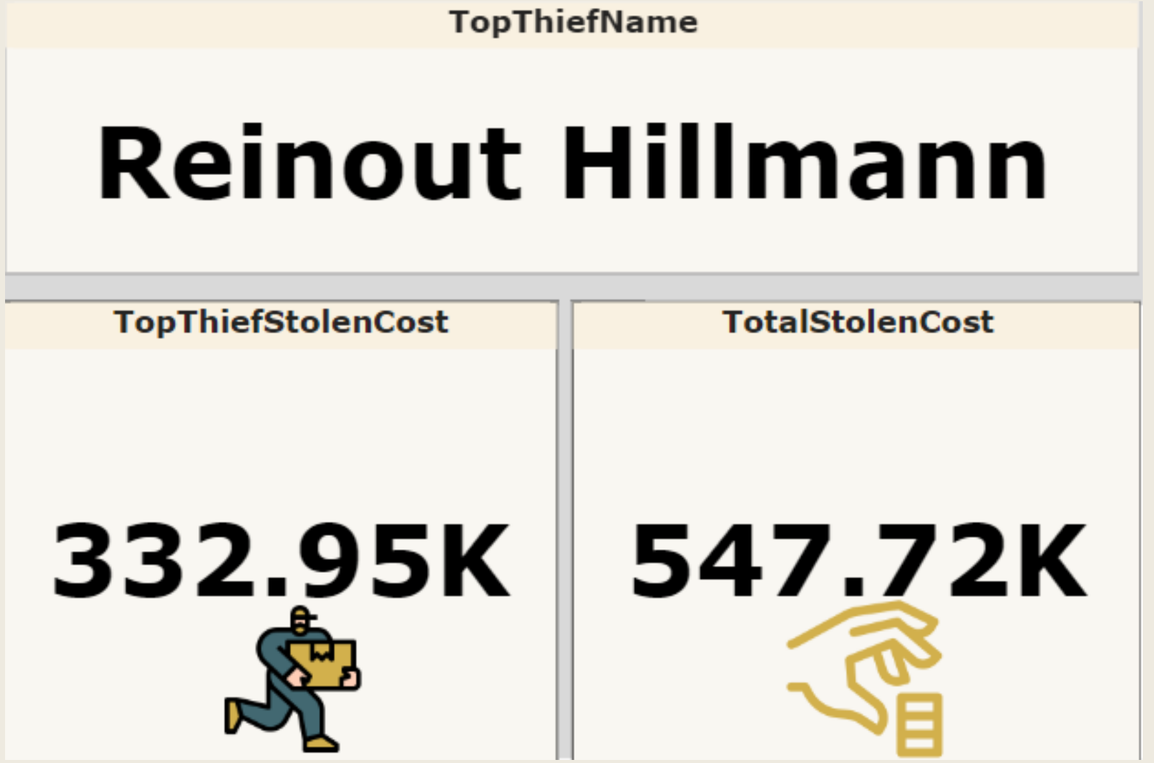


- **Monitor the performance of these top vendors to ensure they continue to meet quantity and quality standards.**

6.8. Data Analysis & Insights:

Q8: Who is responsible for the highest theft, and what is the total stolen cost?

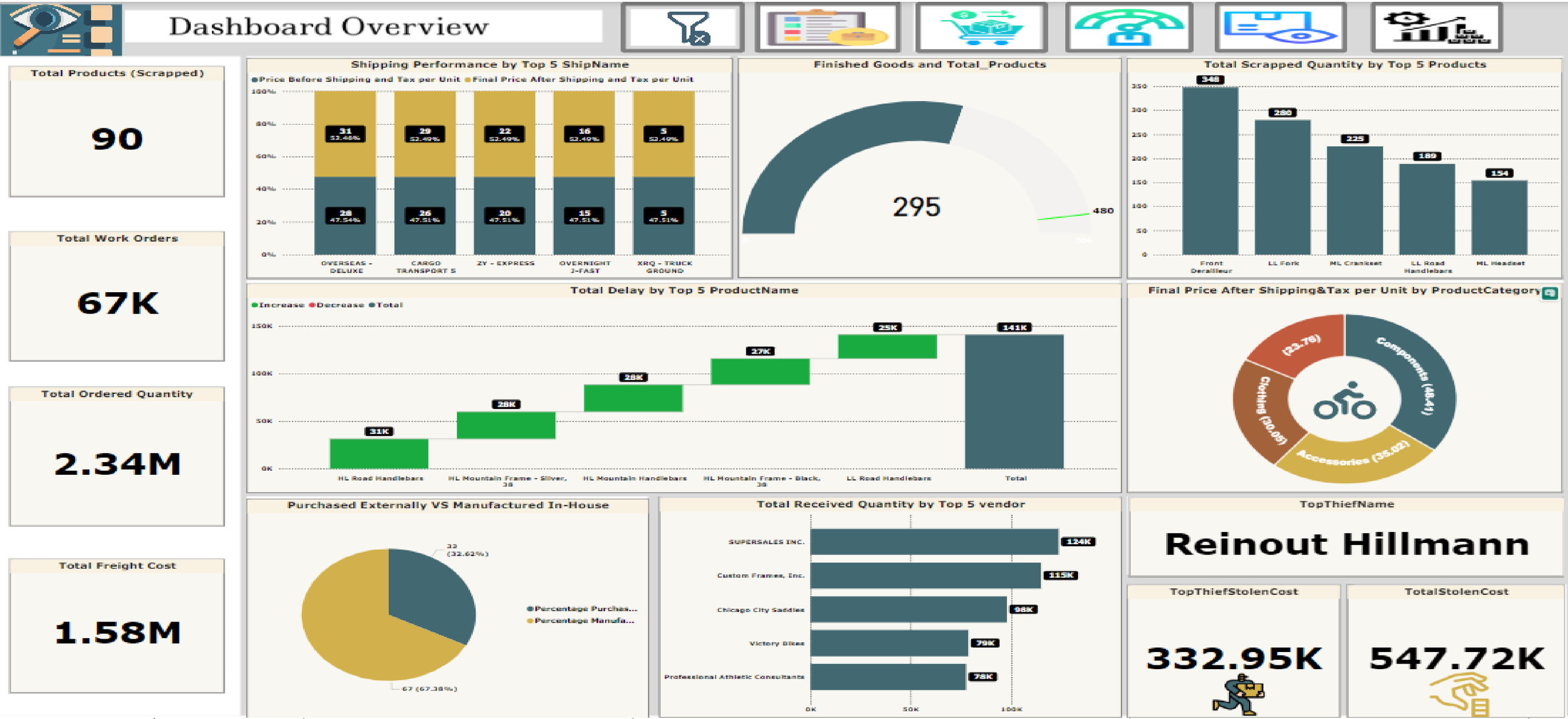
- **Answer: "Reinout Hillmann" is the top thief, with a stolen cost of 332.95K, contributing to a total stolen cost of 547.72K.**



- **Implement stronger theft prevention strategies to minimize losses, focusing on areas with the highest theft incidents.**

7. 1. Dashboard Overview:

- **In this dashboard, we are visualizing KPIs and insights related to production, procurement, shipping, and work order management. Here's a concise explanation of the dashboard and its main insights:**



7.2.Work Order Performance:

- **This dashboard focuses on Work Order Performance, showcasing critical metrics related to production efficiency, scrap rates, order quantities, and time management in various manufacturing processes.**

Work Order Performance

Location Name
- Debur and Polish
- Final Assembly
- Frame Forming
- Frame Welding

Product Category
- Bikes
  - Mountain Bikes
  - Road Bikes
  - Touring Bikes

ScheduledStartDate
2011 - 2014
2011 | 2012 | 2013 | 2014

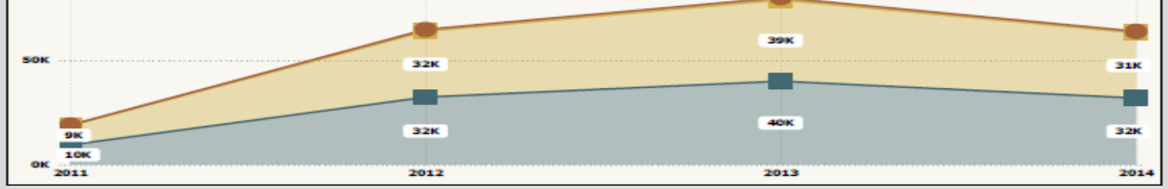
Scrapped Quantity
2796

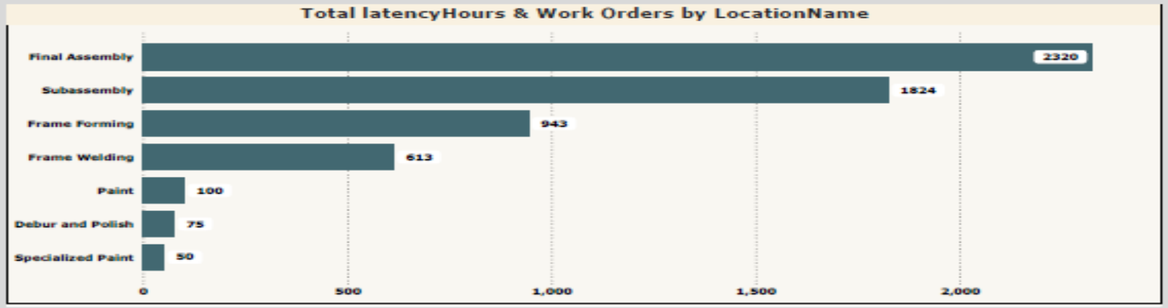
Total Actual Hours
1.19K

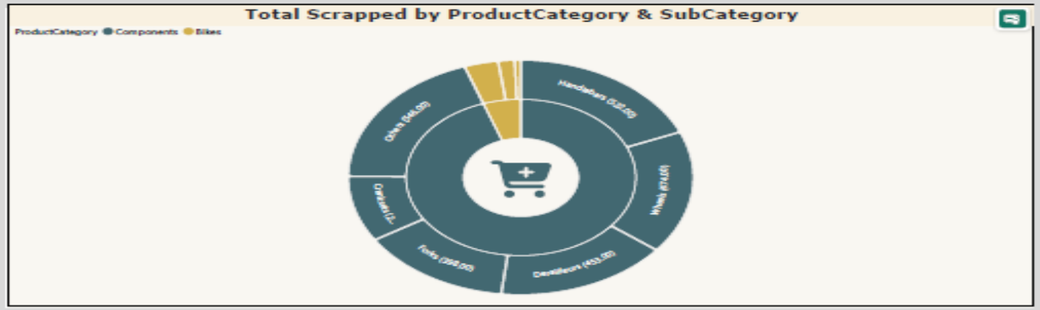
Quantity Difference
111K

Scrap Rate (%)
2.45

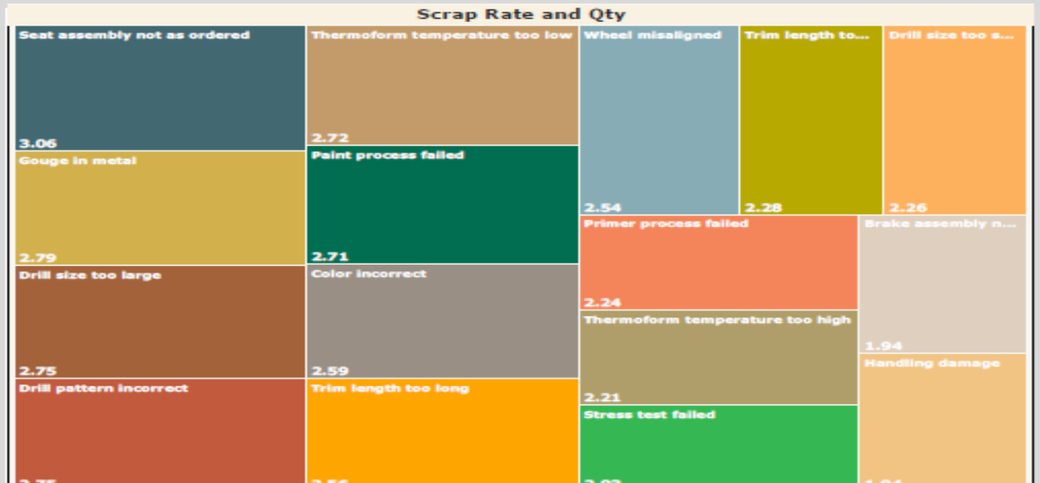
Total Work Orders
351





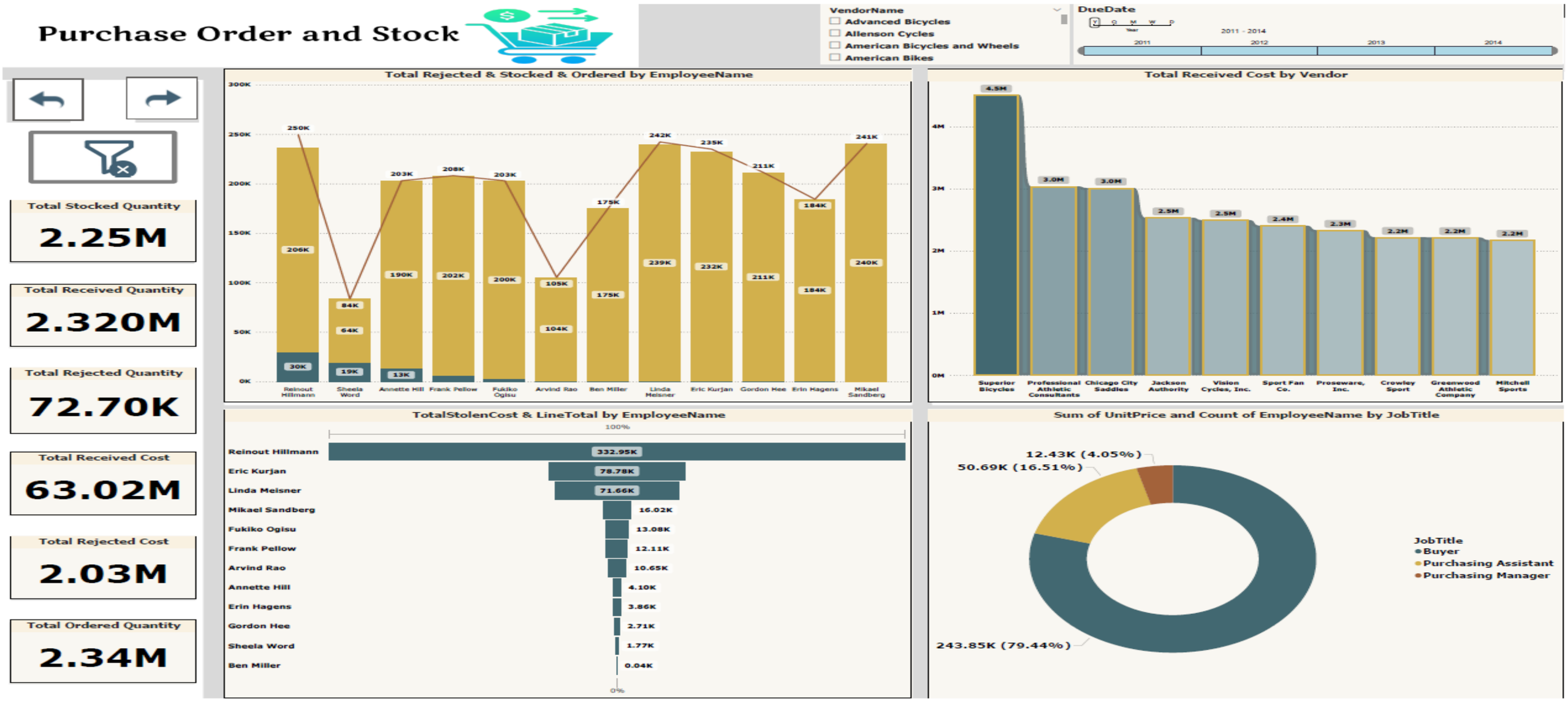


ProductCategory	ProductSubCategory	Name	LocationName	scrappedName	Total Scra
Components	Mountain Frames	HL Mountain Frame - Black, 38	Debur and Polish	Trim length too short	
Components	Mountain Frames	HL Mountain Frame - Black, 38	Final Assembly	Trim length too short	
Components	Mountain Frames	HL Mountain Frame - Black, 38	Frame Forming	Trim length too short	
Components	Mountain Frames	HL Mountain Frame - Black, 38	Frame Welding	Trim length too short	
Components	Mountain Frames	HL Mountain Frame - Black, 38	Paint	Trim length too short	
Components	Mountain Frames	HL Mountain Frame - Black, 38	Subassembly	Trim length too short	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Debur and Polish	Color incorrect	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Debur and Polish	Handling damage	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Debur and Polish	Thermoform temperature too high	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Final Assembly	Color incorrect	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Final Assembly	Handling damage	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Final Assembly	Thermoform temperature too high	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Frame Forming	Color incorrect	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Frame Forming	Handling damage	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Frame Forming	Thermoform temperature too high	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Frame Welding	Color incorrect	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Frame Welding	Handling damage	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Frame Welding	Thermoform temperature too high	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Specialized Paint	Color incorrect	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Specialized Paint	Handling damage	
Components	Mountain Frames	HL Mountain Frame - Silver, 38	Specialized Paint	Thermoform temperature too high	
Total					



7.3.Purchase Order and Stock:

- **This dashboard is designed to provide a holistic view of the purchase order and inventory process, allowing for detailed analysis of cost, quantity, and employee performance in inventory and stock management.**



7.4. Procurement and Shipping Performance:

- **This dashboard offers an overview of shipping performance, highlighting costs, carrier efficiency, and delivery trends over time to support strategic decisions.**

Shipping Performance

ShipDate

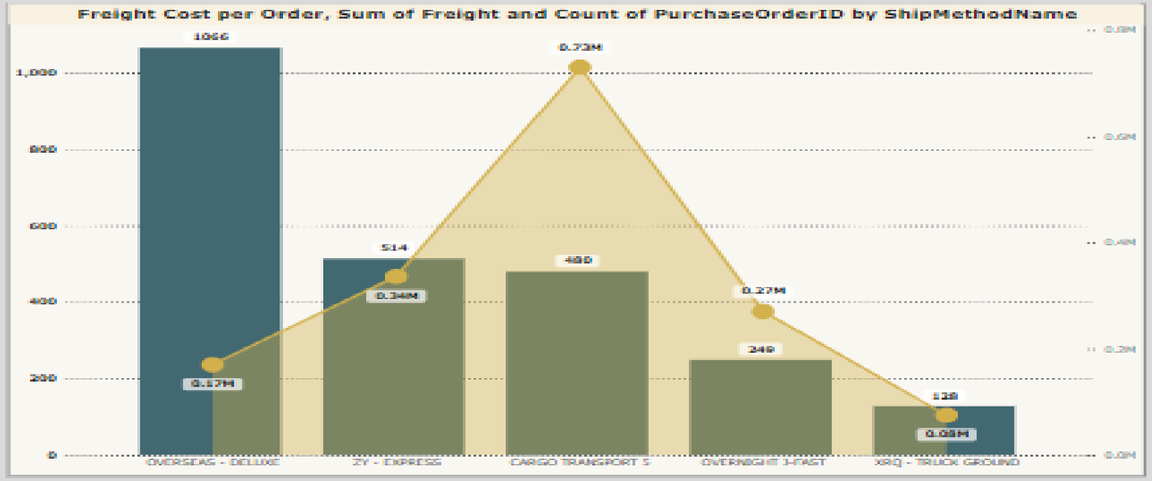
Total Vendors
86

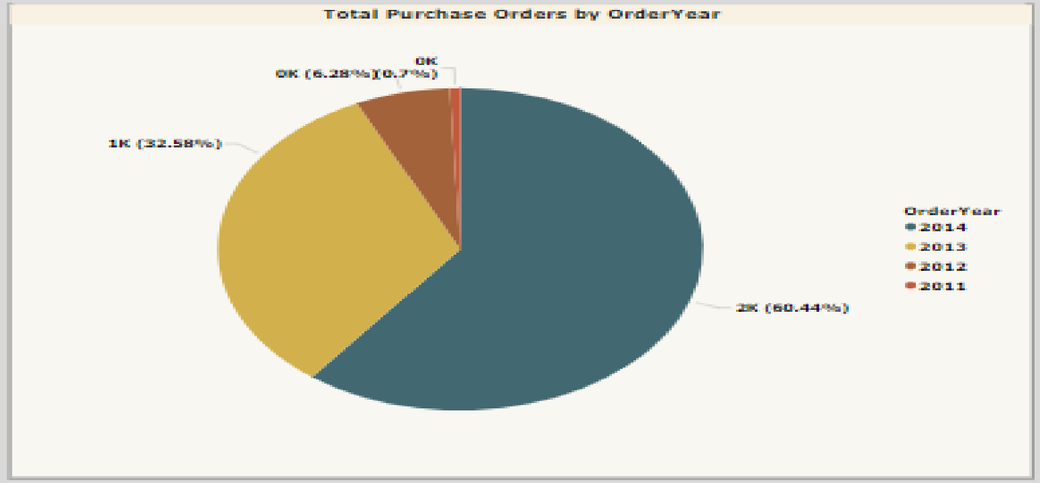
Total Purchase Orders
4012

Total Employees Involved
12

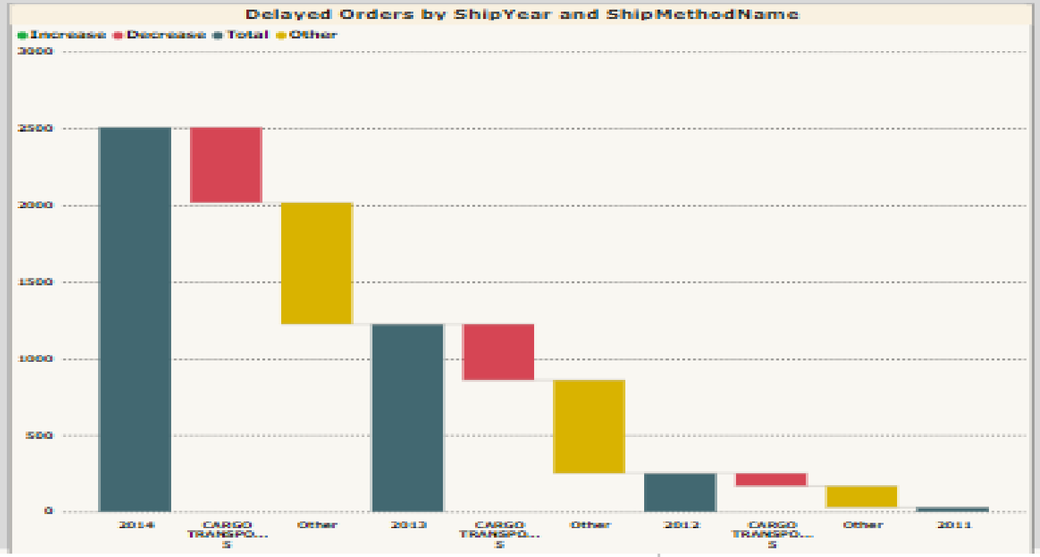
Total Freight Cost
1.58M

Total Due
70.48M





ShipMethodName	ProductName	Price Before Shipping and Tax per Unit	Final Price After Shipping and Tax per Unit
OVERSEAS - DELUXE	Long-Sleeve Logo Jersey, L	10,789.42	11,868.36
OVERNIGHT J-FAST	External Lock Washer 1	6,372.71	7,041.84
OVERNIGHT J-FAST	External Lock Washer 6	6,372.71	7,041.84
OVERNIGHT J-FAST	External Lock Washer 3	6,083.04	6,721.76
OVERNIGHT J-FAST	External Lock Washer 4	6,083.04	6,721.76
OVERNIGHT J-FAST	External Lock Washer 5	6,083.04	6,721.76
OVERNIGHT J-FAST	External Lock Washer 7	6,083.04	6,721.76
OVERNIGHT J-FAST	External Lock Washer 9	6,083.04	6,721.76
OVERSEAS - DELUXE	Men's Sports Shorts, S	3,596.47	3,956.12
OVERSEAS - DELUXE	Long-Sleeve Logo Jersey, M	3,082.69	3,390.96
ZY - EXPRESS	External Lock Washer 1	2,543.02	2,810.04
ZY - EXPRESS	External Lock Washer 6	2,543.02	2,810.04
ZY - EXPRESS	External Lock Washer 3	2,421.93	2,676.23
ZY - EXPRESS	External Lock Washer 4	2,421.93	2,676.23
ZY - EXPRESS	External Lock Washer 5	2,421.93	2,676.23
ZY - EXPRESS	External Lock Washer 7	2,421.93	2,676.23
ZY - EXPRESS	External Lock Washer 9	2,421.93	2,676.23
CARGO TRANSPORT 5	External Lock Washer 1	1,065.03	1,176.85
CARGO TRANSPORT 5	External Lock Washer 6	1,065.03	1,176.85
CARGO TRANSPORT 5	External Lock Washer 3	1,016.62	1,123.36
CARGO TRANSPORT 5	External Lock Washer 4	1,016.62	1,123.36
CARGO TRANSPORT 5	External Lock Washer 5	1,016.62	1,123.36
CARGO TRANSPORT 5	External Lock Washer 7	1,016.62	1,123.36
CARGO TRANSPORT 5	External Lock Washer 9	1,016.62	1,123.36
Total		1,304.86	1,438.62



7.5. Product Overview:

- This dashboard provides an overview of product metrics, including the total number of products, costs, and distribution across categories, aiding in the analysis of product manufacturing and inventory management.

Product Overview

Total_Products

504

Total Standard Cost

130.34K

Total List Price

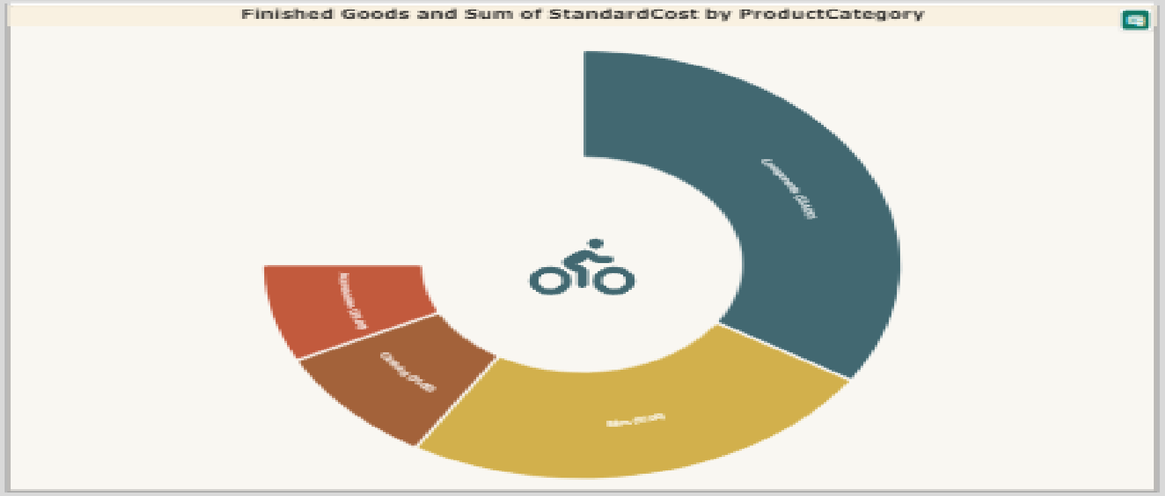
221.09K

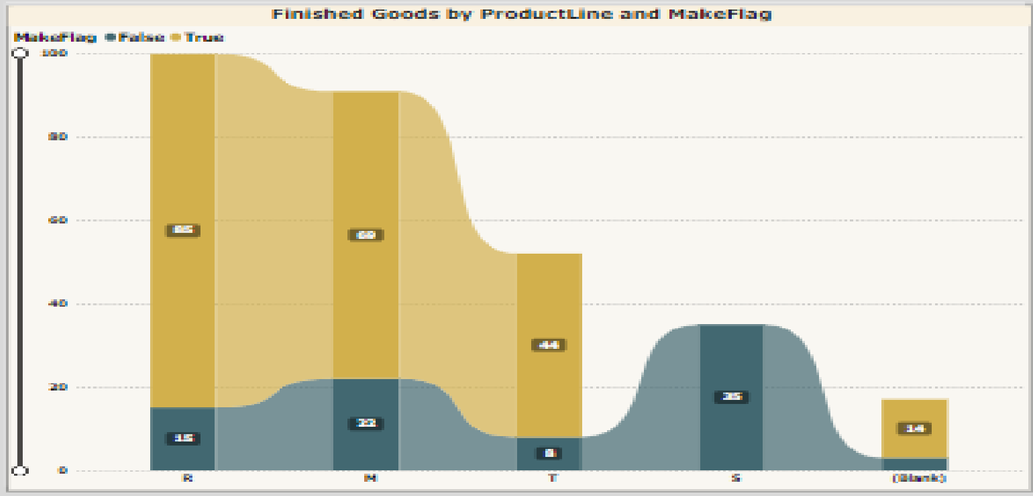
Total Finished Goods Cost

129.28K

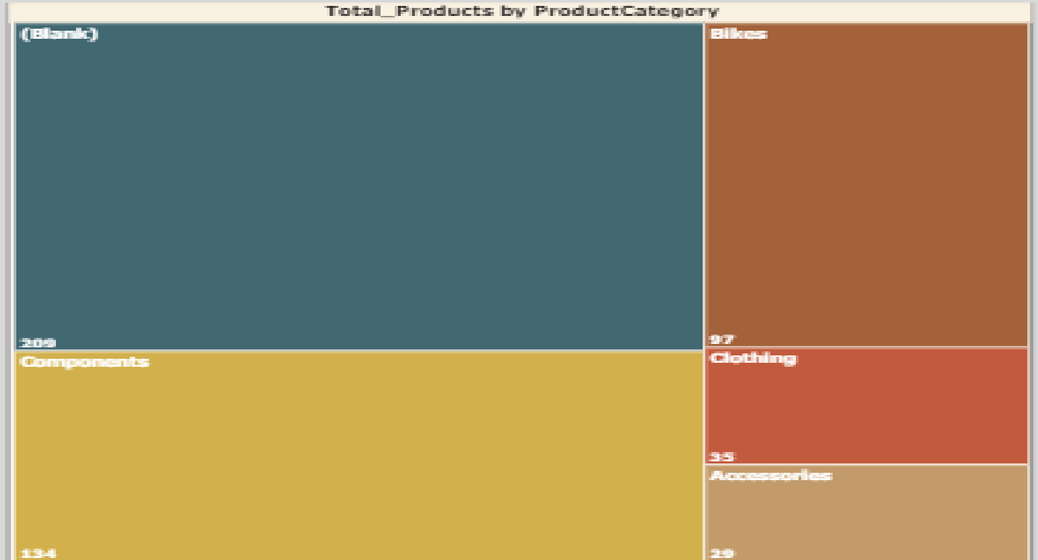
Cost of Manufactured

128.62K



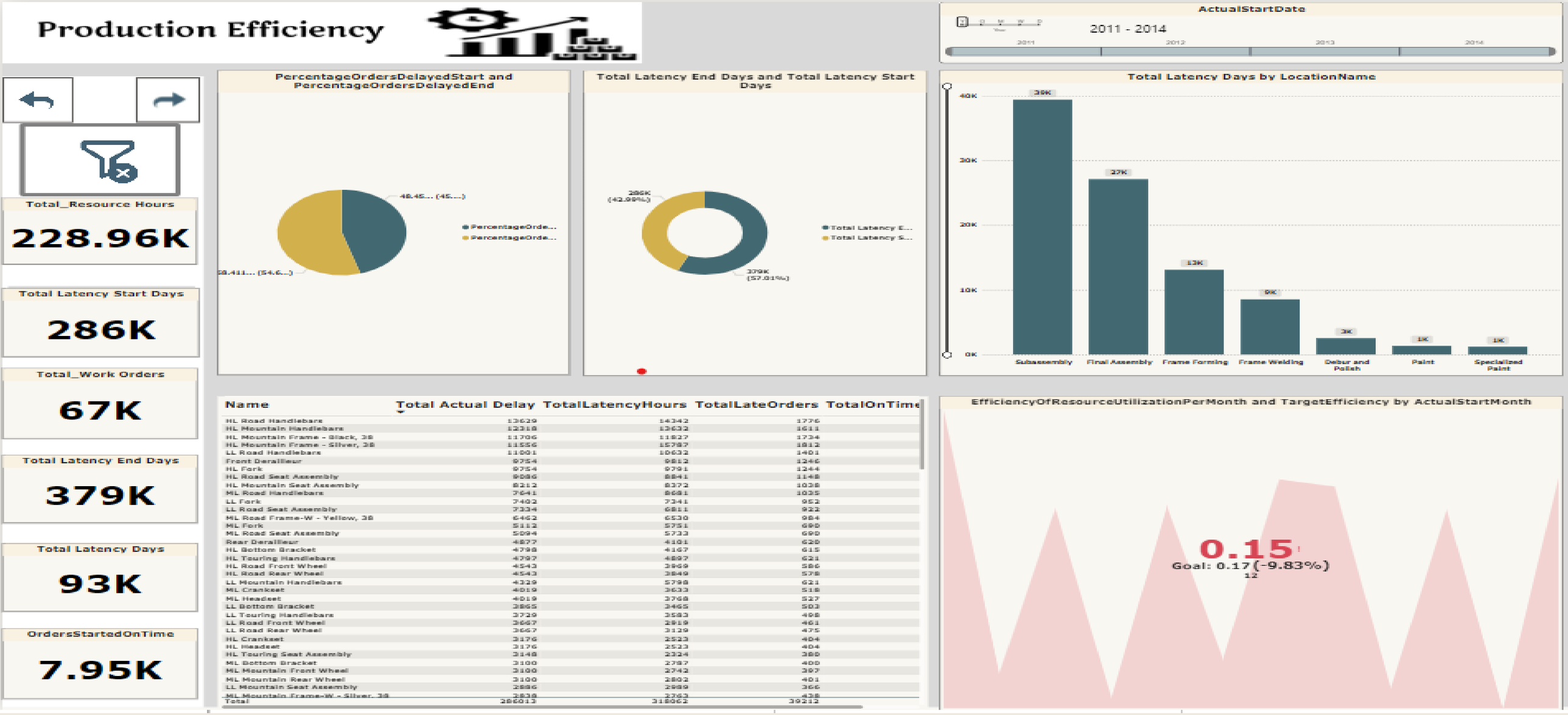


ProductName	SubCategoryName	Sum of ListPrice	Sum of StandardCost	MakeFlag	Fini
Adjustable Race		0.00	0.00	False	False
All-Purpose Bike Stand	Bike Stands	159.00	59.47	False	True
AWC Logo Cap	Caps	8.99	6.92	False	True
Ball Bearing		0.00	0.00	True	False
Bearing Ball		0.00	0.00	False	False
Bike Wash - Dissolver	Cleaners	7.95	2.97	False	True
Blade		0.00	0.00	True	False
Cable Lock	Locks	25.00	10.31	False	True
Chain	Chains	20.24	8.99	False	True
Chain Stays		0.00	0.00	True	False
Chainring		0.00	0.00	False	False
Chainring Bolts		0.00	0.00	False	False
Chainring Nut		0.00	0.00	False	False
Classic Vest, L	Vests	63.50	23.75	False	True
Classic Vest, M	Vests	63.50	23.75	False	True
Classic Vest, S	Vests	63.50	23.75	False	True
Cone-Shaped Race		0.00	0.00	False	False
Crown Race		0.00	0.00	False	False
Cup-Shaped Race		0.00	0.00	False	False
Decal 1		0.00	0.00	False	False
Decal 2		0.00	0.00	False	False
Down Tube		0.00	0.00	True	False
External Lock Washer 1		0.00	0.00	False	False
External Lock Washer 2		0.00	0.00	False	False
External Lock Washer 3		0.00	0.00	False	False
External Lock Washer 4		0.00	0.00	False	False
External Lock Washer 5		0.00	0.00	False	False
External Lock Washer 6		0.00	0.00	False	False
External Lock Washer 7		0.00	0.00	False	False
External Lock Washer 8		0.00	0.00	False	False
External Lock Washer 9		0.00	0.00	False	False
Fender Set - Mountain	Fenders	21.98	8.22	False	True
Flat Washer 1		0.00	0.00	False	False
Flat Washer 2		0.00	0.00	False	False
Flat Washer 3		0.00	0.00	False	False
Flat Washer 4		0.00	0.00	False	False
Flat Washer 5		0.00	0.00	False	False
Flat Washer 6		0.00	0.00	False	False
Total		221,087.79	130,325.89		



7.6. Production Efficiency:

- This dashboard provides a comprehensive analysis of production performance, highlighting key metrics and visualizations that offer insights into resource utilization, start and end delays, and overall operational efficiency.



7.7.Product Components and Assembly:

- This dashboard offers a detailed analysis of component and assembly data, highlighting key metrics such as total product assemblies, component utilization, and manufacturing distribution.

Component & Assembly

Class: H | L | M

Manufactured In-House
67

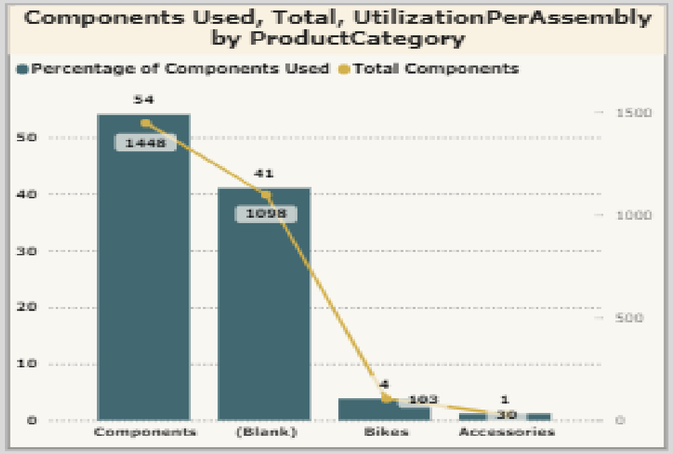
Total Product Assemblies
239

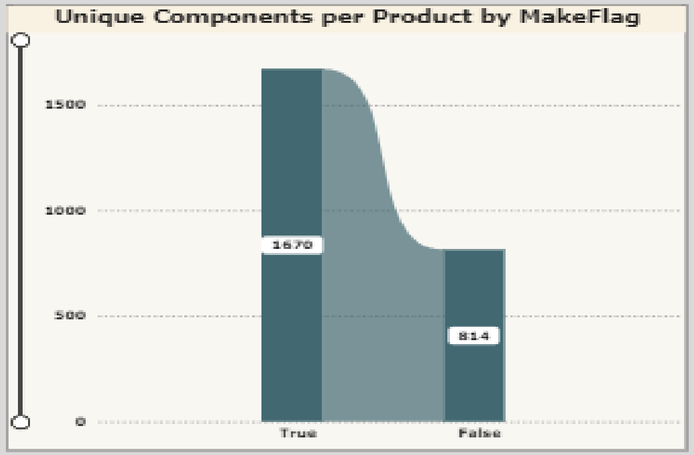
DistinctComponents
325

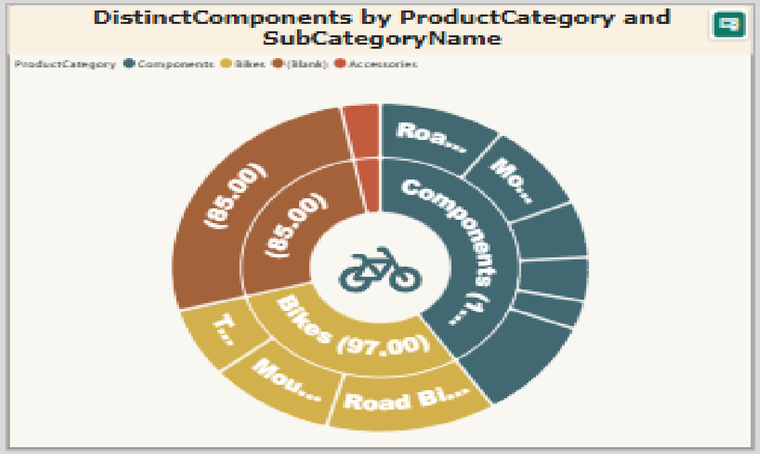
Total Components
2679

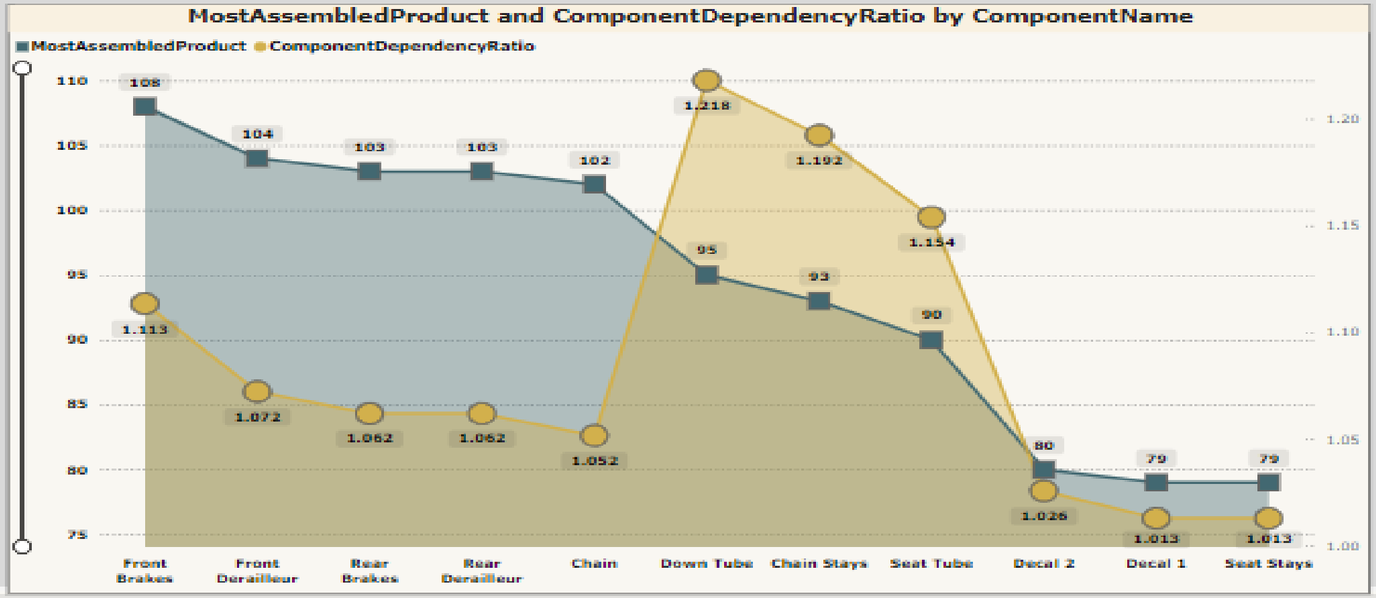
TotalCostComponents
130K

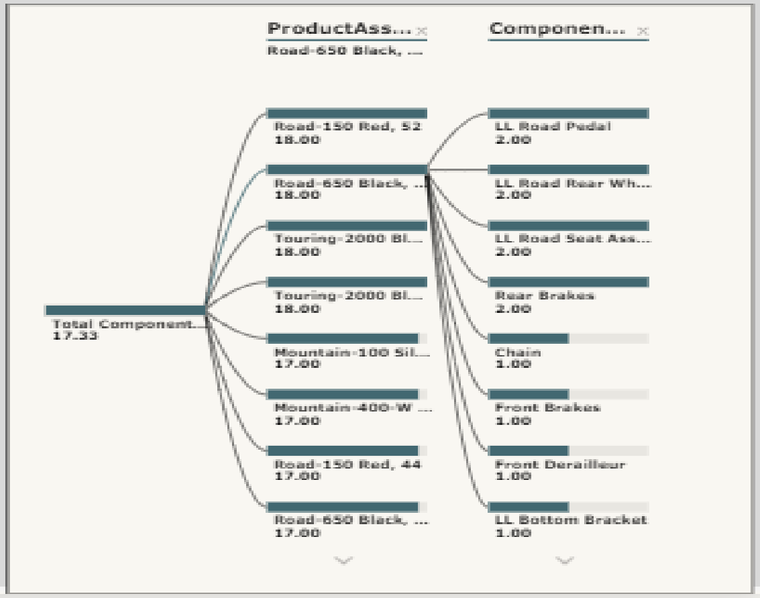
ComponentUtilization
2.68K











8. Recommendations:

- **Reduce Waste:** Focus on products with high scrapping rates and investigate root causes.
- **Optimize Shipping Costs:** Consider revising contracts with "OVERSEAS - DELUXE" or finding alternatives to cut shipping costs.
- **Tackle Delays:** Prioritize reducing delays in high-impact products like "HL Road Handlebars" through process improvement or better scheduling.
- **Improve Security:** Address theft by enforcing stricter controls and monitoring over the employees responsible for inventory.

9. Conclusion:

- **Summary of Key Findings:** The analysis identified significant inefficiencies in production, including delays and discrepancies in stock management. Addressing these issues can help the company reduce costs and improve production efficiency.
- **Importance of the Analysis:** This analysis provides actionable insights that can help the company streamline its production processes, reduce losses due to theft, and enhance overall efficiency.
- **Next Steps:** Based on these findings, the company can take steps to improve both production and inventory management, which will ultimately lead to better operational outcomes. Future analyses could focus on optimizing specific production stages or further investigating purchasing discrepancies.

10. Q&A:

THANK YOU!