

“Supply Chain Analysis of Inventories”

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ABSTRACT

Inventory analysis is the practice of identifying and cataloging the items in a company's stock. The goal of inventory analysis is to get an accurate picture of what a company has on hand so that they can make informed decisions about ordering and stocking levels. Through the lens of data analytics, the research examines key components such as inventory levels, demand patterns, supplier performance, and stock replenishment strategies. The proposed project, "Supply Chain Analysis of Inventories," aims to leverage Power BI, by harnessing Power BI's capabilities, organizations can gain valuable insights into inventory optimization, cost reduction, and operational efficiency within the supply chain. The project will also contribute the significance of leveraging data-driven approaches to streamline inventory management processes and drive strategic decision-making in today's dynamic business environment. Power BI is one of the platforms that can help convert seemingly unrelated sources of data into coherent and interactive visualizations that can be used to manage the supply chain.

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CHAPTER 1

INTRODUCTION

1. Problem Statement

Supply chain analysis inventory in Power BI could be framed around optimizing inventory management by identifying trends, inefficiencies, and opportunities for improvement within the supply chain. This could include analyzing inventory turnover rates, identifying slow-moving or excess stock, evaluating supplier performance, and forecasting demand to ensure optimal inventory levels.

1. Proposed Solution

The proposed solution is to develop a PowerBI dashboard that can analyze and visualize inventory data. The dashboard will integrate data from various sources such as Sales, Customer details, and product details. Supply chain analysis is essential for businesses aiming to optimize their operations and achieve greater efficiency. By analyzing various aspects of the supply chain, organizations can identify areas for improvement, reduce costs, optimize inventory management, and enhance customer satisfaction.

1. Feature

- **Strategic Inventory Placement:**
 - Move inventory to where it adds the most value.
 - Optimize storage locations and distribution centers.
- **Visibility Across the Supply Chain:**
 - Understand where inventory is at each stage of the supply chain.
 - Track inventory movement from suppliers to customers.
 - Ensure real-time visibility to prevent stockouts or excess inventory.
- **Customization and Communication:**
 - Customize pricing based on demand and market conditions.
 - Efficiently send quotes to suppliers and customers.
 - Track orders and manage returns seamlessly.

1. Advantages

- **Data-Driven Decision-Making:** Leverage analytics tools (such as predictive and prescriptive analytics) to make informed choices.
- **Strategic Inventory Placement:** Move inventory to where it adds the most value.
- **Integration with Logistics Management:** Collaborate with logistics teams to optimize transportation and delivery.

1. Scope

The scope of this project aims to leverage data for decision-making and customer engagement. The project can be further extended to incorporate more data sources and advanced analytics techniques, such as machine learning and artificial intelligence, to provide more sophisticated insights into customer behavior. The project also has the potential to be adapted for other sectors, such as retail, healthcare, and telecommunications, where understanding customer behavior is crucial. Furthermore, the project contributes to the broader goal of digital transformation promoting efficiency, innovation, and customer-centricity.

CHAPTER 2

SERVICES AND TOOLS REQUIRED

2.1 Services Used

- **Data Collection and Storage Services:** Banks need to collect and store customer data in real-time. This could be achieved through services like Azure Data Factory, Azure Event Hubs, or AWS Kinesis for real-time data collection, and Azure SQL Database or AWS RDS for data storage.
- **Data Processing Services:** Services like Azure Stream Analytics or AWS Kinesis Data Analytics can be used to process the real-time data.
- **Machine Learning Services:** Azure Machine Learning or AWS SageMaker can be used to build predictive models based on historical data.

2.2 Tools and Software used

Tools:

- **PowerBI:** The main tool for this project is PowerBI, which will be used to create interactive dashboards for real-time data visualization.
- **Power Query:** This is a data connection technology that enables you to discover, connect, combine, and refine data across a wide variety of sources.

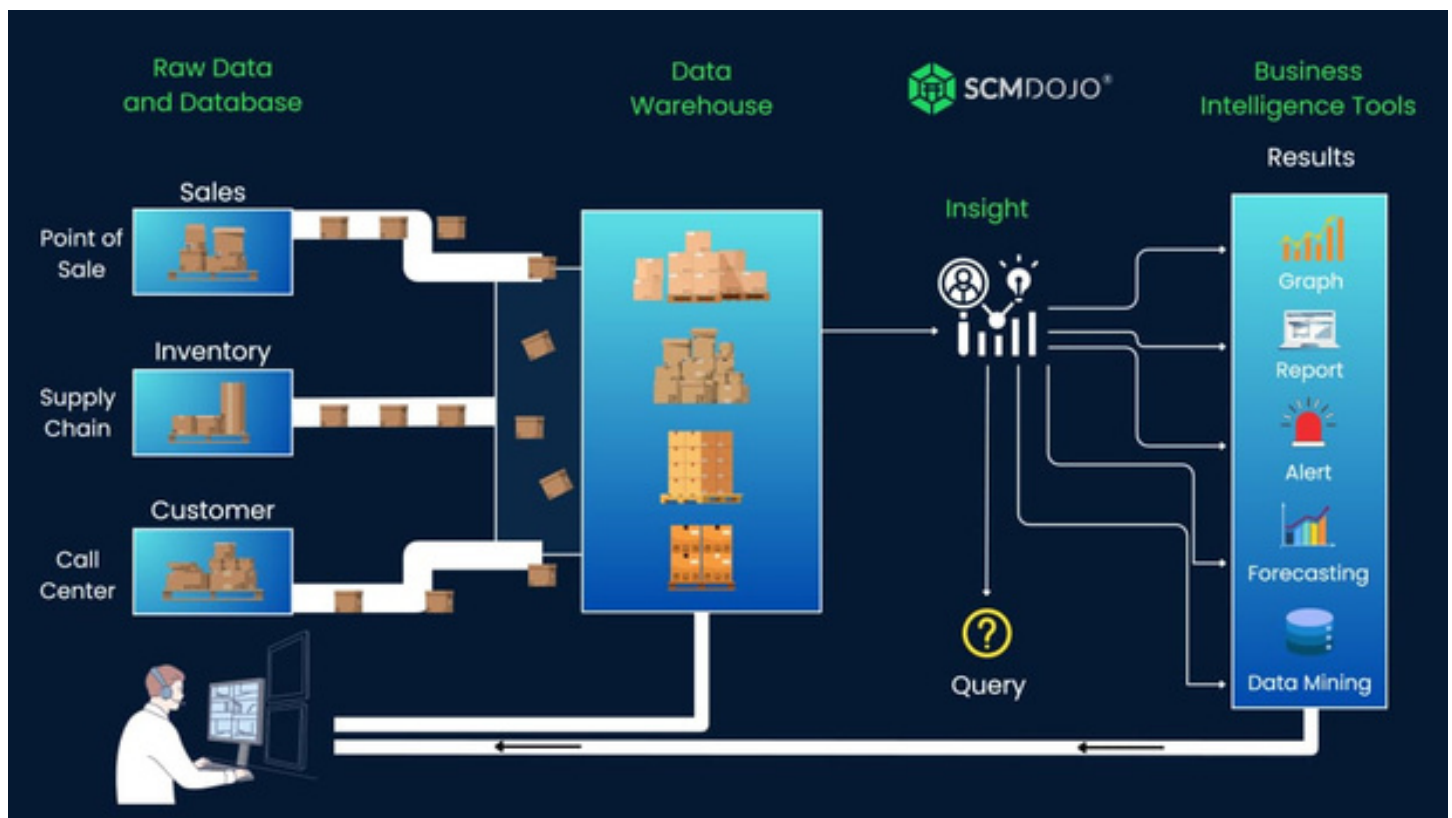
Software Requirements:

- **PowerBI Desktop:** This is a Windows application that you can use to create reports and publish them to PowerBI.
- **PowerBI Service:** This is an online SaaS (Software as a Service) service that you use to publish reports, create new dashboards, and share insights.
- **PowerBI Mobile:** This is a mobile application that you can use to access your reports and dashboards on the go.

CHAPTER 3

PROJECT ARCHITECTURE

3.1 Architecture



Here's a high-level architecture for the project:

Supply chain analytics is the process of using a variety of Business Intelligence (BI) tools to analyze large amounts of enterprise data in order to gain insights into an organization's supply chain, manufacture, and purchasing operations. These BI tools allow businesses to link customer data with internal information such as operations, sales, and finance.

The components of BI include data warehouses, data marts, query and reporting tools, decision support systems, forecasting technology, document warehouses and management systems, knowledge management software, mapping tools and visualization technology.

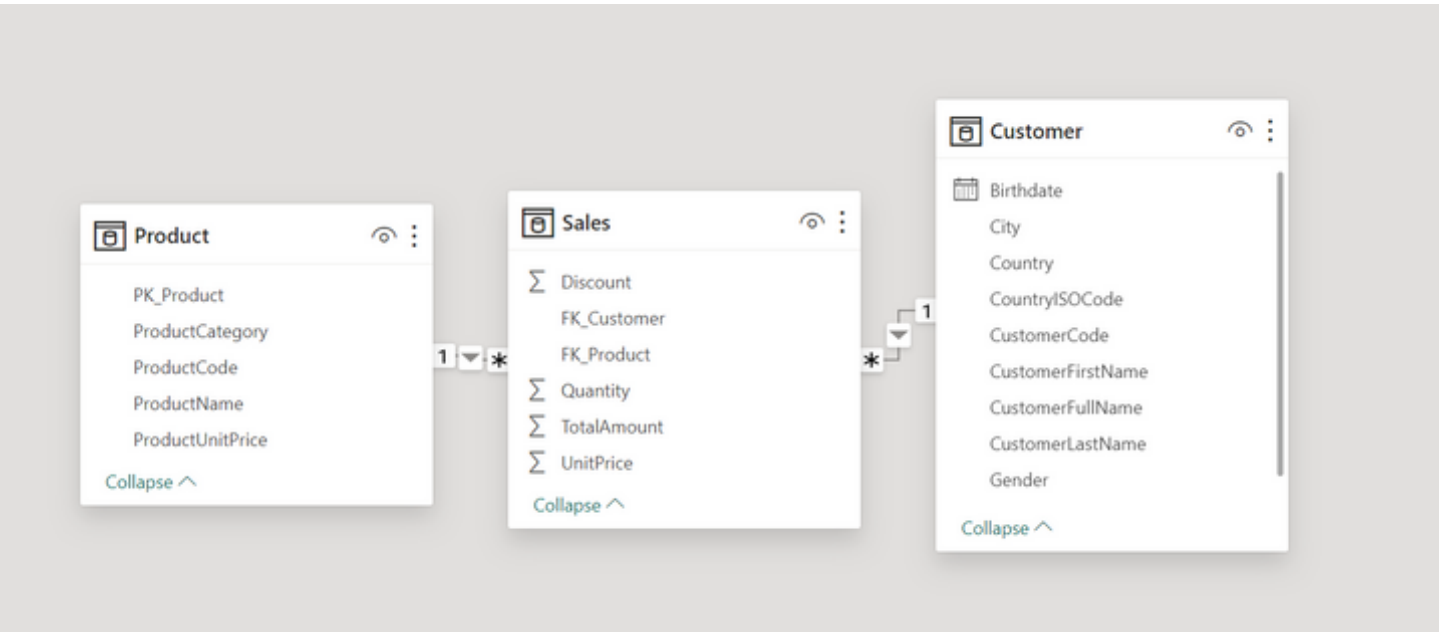
Data warehousing stores the core data needed for a SCM analytics solution; data marts are specific to the requirements of individual departments; query and reporting tools provide multidimensional views for strategic planning; decision support systems enable real-time analysis; data mining helps uncover trends from unstructured data sources; document warehouses manage document information from various sources; knowledge management platforms provide insight on how knowledgeable employees use their expertise to optimize processes.

For example, technology like this allows organizations to keep track of inventory levels in real-time for better cost optimization decisions or offer customers more accurate estimates on when their orders will arrive.

CHAPTER 4

MODELING AND RESULT

Manage relationship



Column of Customer:

PK_Customer	CustomerCode	CustomerFirstName	CustomerLastName	Country	CountryISOCode	City	Gender	Birthdate	CustomerFullName
1	N79H709	Arnaud	Gastelblum	Belgium	BE	Mouscron	M	Friday, April 9, 1982	Arnaud Gastelblum
2	Z92R903	Pauline	Peanut	France	FR	Villefranche sur mer	F	Wednesday, June 23, 1993	Pauline Peanut
3	H59L252	Antoine	Legrand	Nederland	NL	Rotterdam	M	Friday, June 8, 1984	Antoine Legrand
4	O30R794	Coralie	Brent	Nederland	NL	Maastricht	F	Friday, April 20, 1962	Coralie Brent
5	B42W912	Julien	Pomodoro	France	FR	Roubaix	M	Wednesday, November 27, 1985	Julien Pomodoro
6	I85S191	Sarah	Croche	France	FR	Paris	F	Monday, May 11, 1959	Sarah Croche
7	L75A698	Mike	Jeff	Nederland	NL	Amsterdam	M	Sunday, December 12, 1976	Mike Jeff
8	K49A336	Amina	Loo	Belgium	BE	Brussels	F	Wednesday, October 23, 1940	Amina Loo
9	Q44B467	Bjorn	Bio	Belgium	BE	Charleroi	M	Thursday, August 23, 1945	Bjorn Bio
10	Z91K849	Lisa	Daqusti	Belgium	BE	Antwerp	F	Thursday, November 28, 1957	Lisa Daqusti
11	K74L961	Theresa	Limande	France	FR	Strasbourg	F	Wednesday, June 12, 1974	Theresa Limande
12	V17E452	Hilde	Vanderelst	Nederland	NL	Amsterdam	F	Sunday, October 19, 1969	Hilde Vanderelst

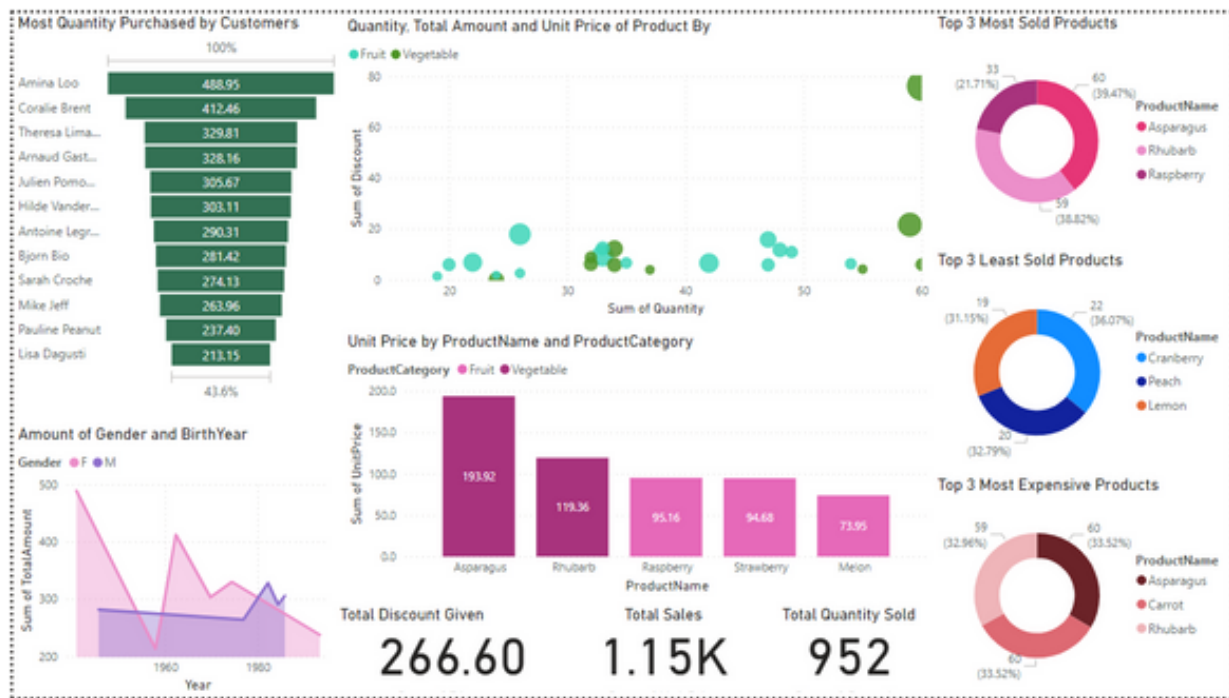
Column of Products:

PK_Product	ProductCode	ProductName	ProductCategory	ProductUnitPrice
1	APP	Apple	Fruit	1.13
2	APR	Apricot	Fruit	2.2
3	BAN	Banana	Fruit	2.04
4	CRA	Cranberry	Fruit	11.34
5	KIW	Kiwifruit	Fruit	3.24
6	LEM	Lemon	Fruit	1.5
7	MAN	Mango	Fruit	4.58
8	ORA	Orange	Fruit	1.4
9	PIN	Pineapple	Fruit	2.55
10	STR	Strawberry	Fruit	10.52
11	PAP	Papaya	Fruit	1.95
12	MEL	Melon	Fruit	4.93
13	RAS	Raspberry	Fruit	7.32
14	TOM	Tomato	Fruit	1.8
15	PEA	Peach	Fruit	3.88
16	ASP	Asparagus	Vegetable	12.12
17	BRO	Broccoli	Vegetable	3.73
18	BRU	Brussels sprout	Vegetable	5.81
19	CEL	Celery	Vegetable	1.3
20	LET	Lettuce	Vegetable	5.95
21	ONI	Onion	Vegetable	0.8

Column of Sales:

FK_Customer ▾	FK_Product ▾	Quantity ▾	UnitPrice ▾	Discount ▾	TotalAmount ▾
FK_Customer	6	1	1.5	0	1.5
1	7	1	4.58	0	4.58
5	8	4	1.4	0	5.6
9	17	2	3.73	0	7.46
11	23	6	4.13	0	24.78
2	8	1	1.4	0	1.4
12	18	3	5.81	0	17.43
1	6	3	1.5	0	4.5
8	7	6	4.58	0	27.48
9	14	3	1.8	0	5.4
1	12	4	4.93	0	19.72
5	21	5	0.8	0	4
9	24	6	1.79	0	10.74
9	3	2	2.04	0	4.08
5	14	2	1.8	0	3.6
2	14	1	1.8	0	1.8
11	11	6	1.95	0	11.7
5	22	5	7.46	0	37.3
9	18	4	5.81	0	23.24
7	13	2	7.32	0	14.64
10	24	6	1.79	0	10.74

Dashboard



CONCLUSION

The project "Supply Chain Analysis of Inventories" using PowerBI has successfully demonstrated the potential of data analytics. The supply chain analyst ensures proper

flow of goods through each channel of the supply chain by gathering and analyzing data for each channel specifically, reducing any inefficiencies along the way, solving any problems, and establishing a profitable flow of the product to the end consumer

FUTURE SCOPE

The future scope of this project is vast. With the advent of advanced analytics and machine learning, PowerBI can be leveraged to predict future trends based on historical data. Supply chain analytics is a relatively new field that is rapidly growing in popularity. With the advent of big data, there is an increasing demand for professionals who can analyze large data sets and identify trends and patterns. Furthermore, PowerBI's capability to integrate with various data sources opens up the possibility of incorporating more diverse datasets for a more holistic view of customers. As data privacy and security become increasingly important, future iterations of this project should focus on implementing robust data governance strategies. This would ensure the secure handling of sensitive customer data while complying with data protection regulations.

REFERENCES:

1. [How to Create a Supply Chain Analysis Report in Power BI - Zebra BI](#)
1. [Power BI for Supply Chain and Retail Analysis: Full Guide \[+ report templates\] - ZoomCharts Power BI Custom Visuals Blog](#)

Case Study Report **Tech Saksham**

Data Analytics with Power BI