



Diagnostic Analytics in Supply Chain Management

Welcome to today's lecture on diagnostic analytics. Today, we'll explore how to use data to diagnose issues within supply chains. This will help us identify root causes of problems, make better decisions, and improve overall efficiency.

 **Dr. Maharajan K**





Recap: Predictive Analytics in SCM

1 Forecasting Demand

We learned how to predict future demand using historical data and statistical models.

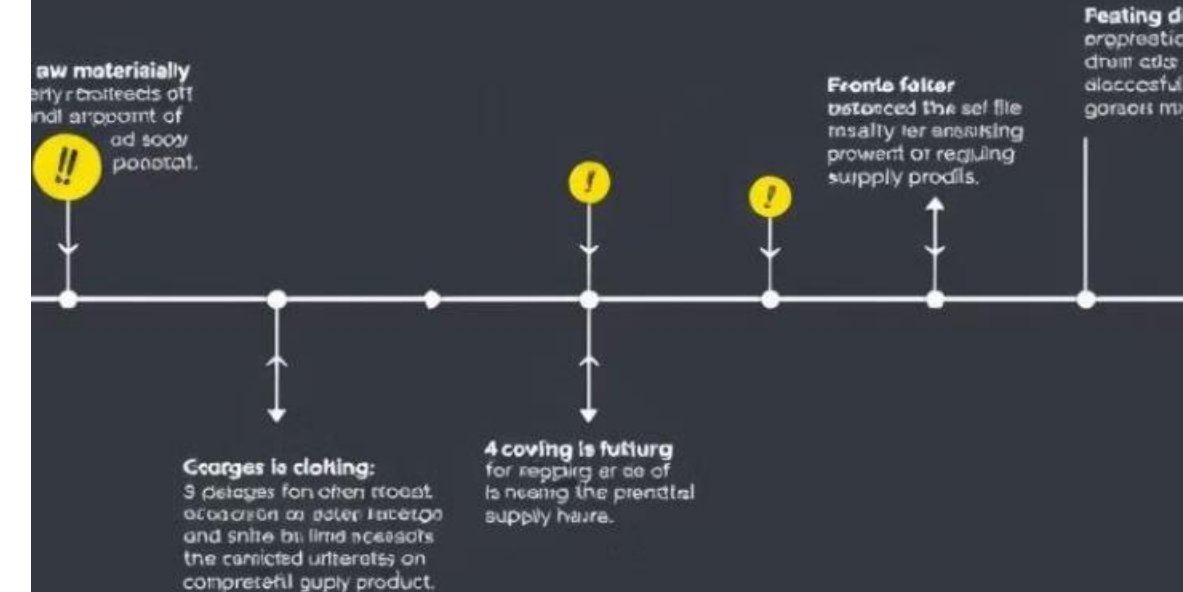
2 Identifying Potential Disruptions

Predictive models can help anticipate disruptions like natural disasters or supplier delays.

3 Optimizing Inventory Levels

Predictive analytics helps determine optimal inventory levels to balance costs and avoid stockouts.

Supply CHAIN





Guess the Topic



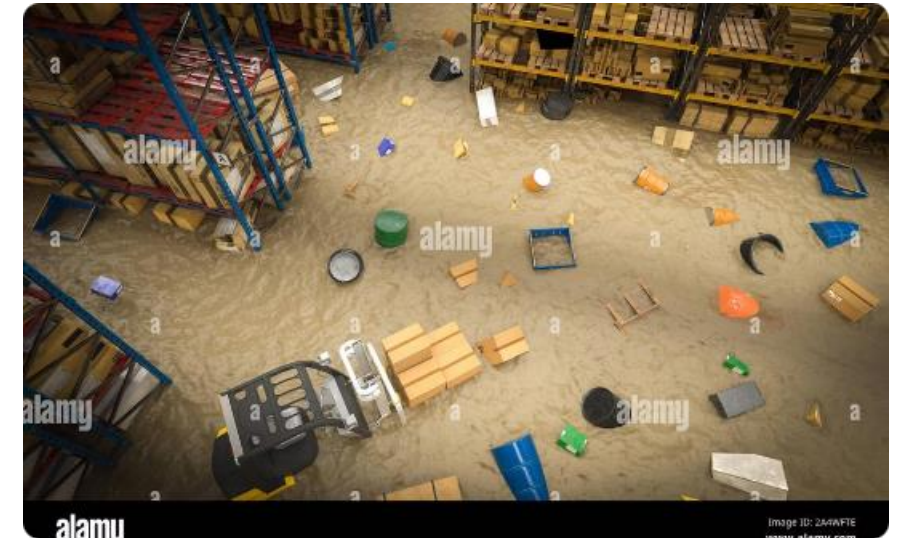
Traffic Congestion

Delays caused by traffic jams can significantly impact delivery times.



Stockouts

Insufficient inventory leads to lost sales and customer dissatisfaction.



Damaged Products

Poor handling or storage conditions can result in product damage, leading to losses.



What is Diagnostic Analytics? Definitions and applications in SCM

Data-Driven Insights

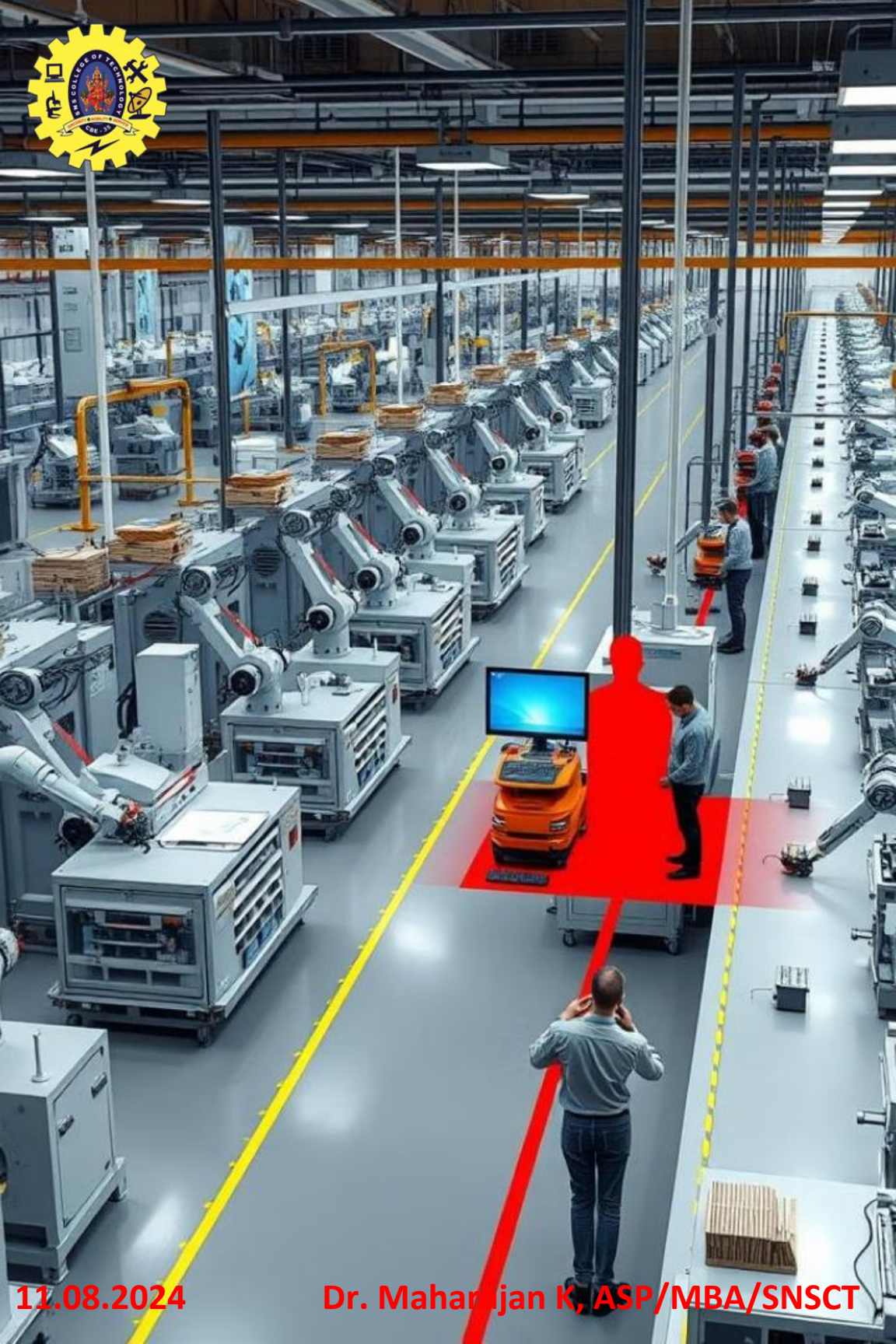
Diagnostic analytics helps uncover the root causes of supply chain issues by analyzing historical data.

Identifying Bottlenecks

Diagnostic analytics identifies points of congestion or delay within the supply chain network.

Understanding Performance Trends

It helps analyze historical performance data to identify areas where improvements are needed.



Real-life Case Study 1: Diagnosing a bottleneck in a manufacturing process

1

Problem

A manufacturing plant experiences delays in producing a specific component.

2

Data Analysis

Diagnostic analytics reveals a bottleneck at the assembly line's final inspection station.

3

Solution

Adding an extra inspection station or optimizing the inspection process resolves the bottleneck.



Real-life Case Study 2: Identifying the root cause of a supply chain disruption

Disruption

A major port closure disrupts the flow of imported raw materials.

Data Analysis

Diagnostic analytics reveals a pattern of increased delays and inventory shortages.

Solution

Identifying alternative suppliers or shipping routes mitigates the disruption's impact.



Hands-on Activity: Analyzing a sample dataset to identify issues



Data Exploration

Start by exploring the dataset and understanding its structure and variables.

Data Visualization

Create charts and graphs to visualize the data and identify potential issues.

Root Cause Analysis

Analyze the data to determine the root causes of identified issues.

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	18.705	1.875,000	4.270,008	4.307,006	1.597,006
	13.156	1.311,008	4.772,005	4.577,005	1.967,006
	14.005	2.723,009	4.672,095	4.371,027	2.357,001
	12.705	1.585,008	1.865,005	4.320,003	1.555,006
	12,703	1.511,003	4.501,005	4.585,00%	-1.371,007
	18,077	1.775,007	4.221,008	4.467,005	4.357,006
	17,315	1.214,009	+221,007	-500,018	2.550,006
	31,755	1.443,700	4.781,008	4.291,005	1.732,005
	33,445	1.783,006	1.803,008	-160,003	4.793,006
	32,955	1.773,000	-7121,000	-512,027	2.372,000
	34,505	3.128,009	-1371,008	-123,023	1.528,000
	37,703	1.5541,008	+710,008	-873,005	1.5615,0%
	37,765	1.975,000	-117,000	-607,073	1.146,758
	7,4708	1.599,000	+225,2155	---	+4.755,000
	27,769	1.359,008	-183,008	---	+510,008



Quiz: Test your understanding of diagnostic analytics techniques

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1.

Which of the following techniques is NOT typically used in diagnostic analytics?

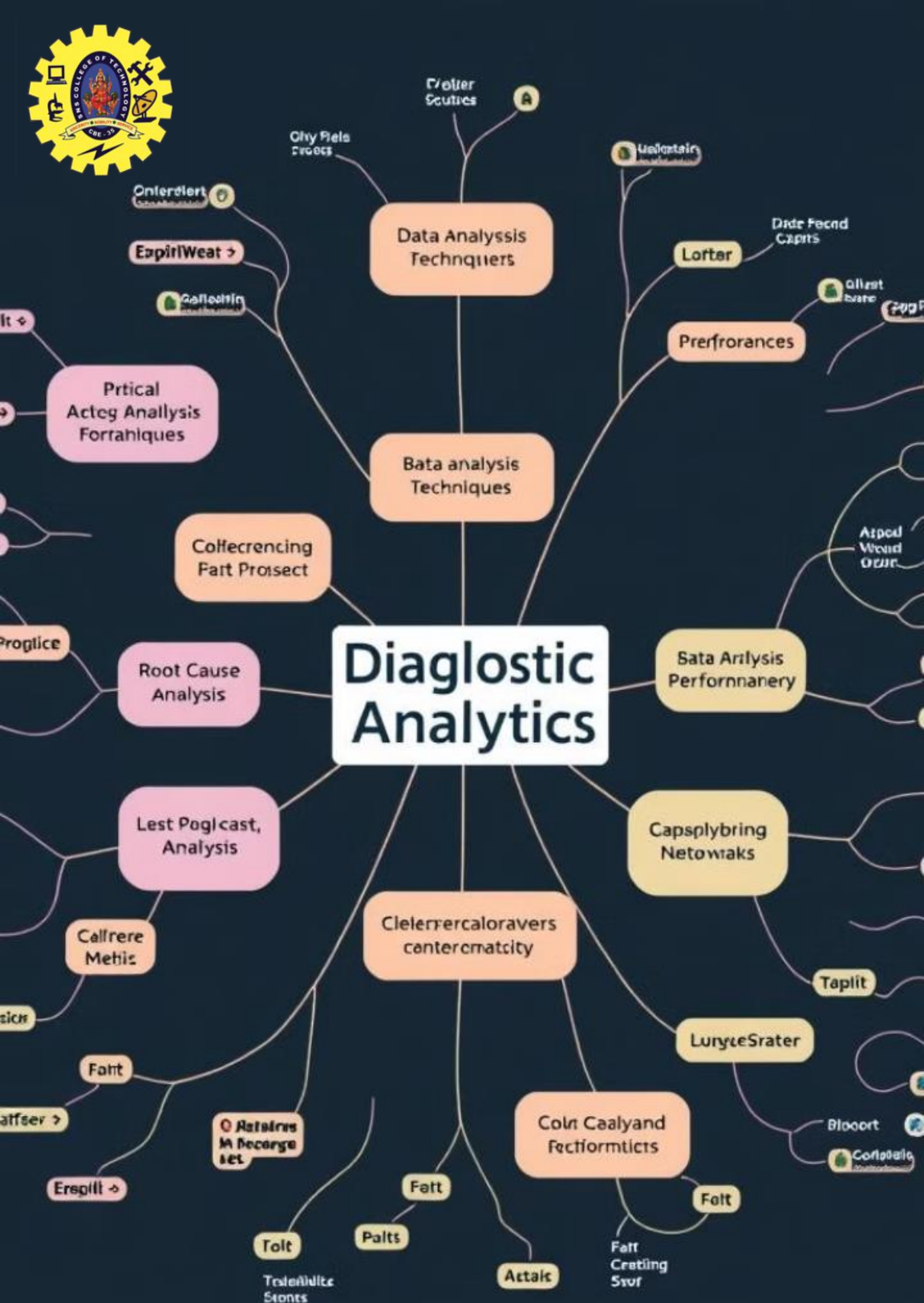
- A. Regression analysis
- B. Time series analysis
- C. Machine learning classification
- D. Root cause analysis

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Summary of Key Concepts and Techniques



Data Collection & Preparation

Gather relevant data and prepare it for analysis.



Data Visualization

Create charts and graphs to identify trends and anomalies.



Root Cause Analysis

Investigate the underlying reasons behind supply chain issues.



Actionable Insights

Develop solutions and implement improvements based on the findings.



References: Books and online resources

- Supply Chain Management: Strategy, Planning, and Operations by Chopra and Meindl
- Business Analytics: Data Analysis and Decision Making by Albright, Winston, and Zappe
- Harvard Business Review articles on supply chain analytics
- McKinsey & Company reports on digital supply chains

