CASE STUDY 2: DATA ANALYSIS FOR SUPPLY CHAIN OPTIMIZATION

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**Background:** A manufacturing company is experiencing challenges in its supply chain management, resulting in inefficiencies, increased costs, and delays in delivering products to customers. They have a wealth of data related to inventory levels, production schedules, transportation, and supplier performance. The company aims to leverage data analysis techniques to identify bottlenecks, optimize inventory management, and improve overall decision-making in the supply chain.

**Objective:** The objective is to utilize data analysis to identify areas of improvement within the supply chain, optimize inventory levels, streamline production schedules, and enhance decision-making processes to reduce costs and improve operational efficiency.

**Explain the approach you will employ to achieve the objective.**

1. Define the objectives to be achieved, which are;

* Improving the supply chain.
* Optimization of inventory levels.
* Streamlining production schedules.
* Enhancing decision-making processes to reduce costs and improve efficiency.

1. Data collection. I will gather the relevant data from the reliable sources available which include inventory levels, production schedules, transportation, and supplier performance.
2. Data cleaning and pre-processing. After collecting the relevant data, I will need to clean the data so as to remove errors, inconsistencies, or missing values. I will have to check the collected data for any unnecessary values and duplicate data in the inventory levels and production schedules, and remove them. I will need to ensure the data collected from the various sources has a uniform formatting for analysis. I will also convert the data types, whereby all the text data will be categorized as such, and numerical values will be categorized with numbers. This will ensure the data is accurate, complete, and in a suitable format for analysis.
3. Exploratory data analysis. I will employ exploratory data analysis since it is important to explore and discover patterns, trends, and relationships within the data collected. I will explore the data by using descriptive statistics to calculate measures such as mean, median, mode or standard deviation to summarize and describe the available data. I will also use visualizations such as charts and graphs to visualize the patterns and trends in the data. From these measures, I will be able to gain initial insights and identify any patterns on the operational processes of the company.
4. Advanced analytics techniques. So as to uncover deeper insights and make predictions that are relevant to the objectives, I will need to conduct advanced analytics. I will apply predictive modelling, statistical techniques, or data mining to uncover deeper insights. This will offer improved forecasting, and provide strategic guidance which will enhance the company’s decision-making process.
5. Interpretation and communication. After carrying out advanced analytics, I will interpret the results of the data analysis and extract meaningful insights that will be relevant to the objectives of the data analysis. Finally, I will communicate the findings to the company’s decision-makers using visualizations, reports, or presentations for effective communication.

**What are the expected results?**

1. Decision-makers will be able to anticipate future scenarios and make proactive decisions from data analysis techniques such as predictive modelling and forecasting.
2. The data analysis will help to identify patterns, trends, and correlations within the data, providing valuable insights into the current state and potential future outcomes.
3. From the data analysis, the decision-makers will rely on objective evidence rather than subjective opinions or biases.
4. By analysing data on resource usage, costs, and performance, data analysis will enable decision-makers to allocate resources optimally and improve efficiency.
5. Data analysis will help to quantify risks and uncertainties associated with different decisions, allowing decision-makers to asses and manage them effectively.
6. Decisions will be based on data-driven insights as the data analysis provides a factual basis for decision making.
7. Data analysis will allow the decision-makers to monitor outcomes, evaluate the impact of decisions, and identify areas of improvement.