Chapter 4
AI-Driven Demand Forecasting and Inventory Management

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ABSTRACT

Overall, successful sustainability companies exist across all industries. Two of the most fundamental components of an inventory management system are deeply interconnected and are essential for balancing customer demand with product availability, minimising costs, improving customer satisfaction, and enhancing operational efficiency. Demand forecasting involves historical seasonal patterns, relevant data, and allows businesses to inform production planning, levels, staffing, and distribution. The ability to anticipate helps companies avoid both understocking, holding costs, waste, and obsolescence. With globalisation and increased competition, crucial to align their resources with market requirements and remain agile in

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a rapidly changing environment. Several methods and technologies are employed in demand forecasting, ranging from qualitative techniques like using time-series analysis, AI, and predictive significantly improve demand insights proactive.

INTRODUCTION

The Importance of Demand Forecasting and Inventory Management in Supply Chain Management

Overall, successful sustainability companies exist across all industries. Two of the most fundamental components of an inventory management system are deeply interconnected and are essential for balancing customer demand with product availability, minimising costs, improving customer satisfaction, and enhancing operational efficiency. Demand forecasting involves historical seasonal patterns, relevant data, and allows businesses to inform production planning, levels, staffing, and distribution. The ability to anticipate helps companies avoid both understocking, holding costs, waste, and obsolescence. With globalisation and increased competition, crucial to align their resources with market requirements and remain agile in a rapidly changing environment. Several methods and technologies are employed in demand forecasting, ranging from qualitative techniques like using time-series analysis, AI, and predictive significantly improve demand insights proactive. These tools help companies not only forecast demand more accurately but also respond swiftly to market fluctuations, disruptions, and changes in consumer behaviour. On the other hand, inventory management refers to the supervision and control of goods and materials that a company holds in stock. Effective inventory to meet customer demand without incurring unnecessary costs. It involves activities such as ordering, storing, tracking, and replenishing inventory. Inventory working capital, service levels, and operational efficiency practices stockouts. The synergy is essential to provide the foundation upon which inventory decisions are made. When demand is forecasted accurately, companies can optimise they're. This alignment ensures that production and distribution schedules are efficient, customer expectations are met, is more resilient and responsive. Moreover, effective demand forecasting and inventory management and the carbon footprint associated with unnecessary production and storage. They also enhance financial performance by lowering inventory carrying costs, improving cash flow, and increasing turnover rates. In retail, manufacturing, and e-commerce, product availability is critical. The COVID-19 pandemic provided a stark reminder of the need for agile and data-driven supply chain strategies. Companies with accurate forecasting and flexible inventory systems were better positioned to navigate disruptions, meet surges in demand for essential products,