

Supply Chain Fundamentals: Demand Forecasting & Inventory Optimization

Learn to predict demand accurately and optimize inventory for better supply chain efficiency. Ideal for logistics managers and analysts.

Business Instructor: Daniel Foster • 5 sections • 51 lessons • 17.75h total

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About this course

Supply chains often struggle with inaccurate forecasts and inventory imbalances that increase costs and reduce customer satisfaction. This course addresses these common problems by teaching you how to use proven methods to improve forecasting accuracy and inventory control. You'll learn through video lessons, solve real-world problems with case studies, and gain practical skills to apply directly in your role. Topics include statistical forecasting, inventory models, and implementation strategies suitable for various industries.

Course curriculum

Getting Started with Demand Forecasting and Inventory Basics

- **Introduction to Supply Chain and Logistics (10m)**
Discover the key components of a supply chain and how they interact to move products from source to customer.
- **Understanding Demand Forecasting: Why It Matters (14m)**
Learn how accurate forecasting impacts operations, reduces costs, and improves service levels in practical terms.
- **Types of Demand Patterns and Data Sources (12m)**
Identify different demand behaviors like seasonality and trends, and find reliable data for forecasting.
- **Basic Statistical Measures for Forecasting (18m)**
Step-by-step guide to calculating measures like mean, median, and seasonal indices from historical data.
- **Inventory Fundamentals: Costs and Classifications (16m)**
Understand holding and ordering costs, and apply ABC analysis to classify inventory items effectively.
- **Setting Up Your Forecasting Environment (20m)**
Practical setup of tools and data collection processes to build a solid forecasting foundation.
- **Introduction to Inventory Replenishment Policies (15m)**
Overview of reorder points and safety stock concepts to maintain optimal inventory levels.
- **Case Study: A Retail Business's Forecasting Challenges (25m)**
Analyze a real retail case to apply basic forecasting and inventory management techniques.

Core Forecasting Methods and Inventory Models

- **Moving Averages and Exponential Smoothing (20m)**
Hands-on practice with calculating and applying these common forecasting techniques to real data.
- **Time Series Analysis for Demand Prediction (22m)**
Break down demand into trends, cycles, and irregularities to improve forecast accuracy.
- **Qualitative Forecasting: Expert Judgment and Surveys (18m)**
Learn when and how to use expert input or customer surveys alongside quantitative methods.
- **Inventory Classification with ABC Analysis (15m)**
Step-by-step categorization of inventory items using real data to prioritize management efforts.
- **Economic Order Quantity (EOQ) Model (25m)**
Calculate optimal order quantities to balance holding and ordering costs in practice.
- **Reorder Point Systems and Safety Stock Calculation (18m)**
Set reorder points and safety stock levels to avoid stockouts while minimizing excess inventory.
- **Integrating Forecasting with Inventory Planning (20m)**
Understand how forecast outputs directly drive inventory replenishment decisions in operations.
- **Handling Forecast Errors and Bias (16m)**
Measure and analyze forecast accuracy to identify and correct common biases.

- **Software Tools for Forecasting: Overview (12m)**
Introduction to popular software used in demand planning and how to get started with them.
- **Problem-Solving Session: Overcoming Data Gaps (22m)**
Practical exercises to handle missing or inconsistent data in forecasting scenarios.

Advanced Forecasting Techniques and Optimization Strategies

- **Advanced Time Series Models: ARIMA and Beyond (28m)**
Explore statistical models like ARIMA for more complex demand patterns with real data applications.
- **Machine Learning Basics for Demand Forecasting (30m)**
Introduction to using algorithms and neural networks to enhance forecast accuracy in supply chains.
- **Multi-Dimensional Forecasting: Incorporating External Factors (25m)**
Learn to include economic indicators, promotions, or weather data to refine predictions.
- **Inventory Optimization under Uncertainty (22m)**
Apply stochastic models and simulation techniques to manage inventory in volatile environments.
- **Dynamic Pricing and Inventory Interactions (20m)**
Understand how pricing strategies affect demand and inventory decisions with practical examples.
- **Sustainability in Inventory Management (18m)**
Reduce waste and environmental impact while maintaining service levels through smarter inventory practices.
- **Case Study: Advanced Forecasting in E-commerce (32m)**
Apply complex models to a real e-commerce business to solve demand forecasting challenges.
- **Workshop: Tuning Forecasting Parameters (24m)**
Hands-on practice adjusting parameters in forecasting models to optimize performance.

Applying Skills in Real-World Scenarios

- **Industry-Specific Forecasting: Retail vs. Manufacturing (20m)**
Compare different approaches to forecasting in retail and manufacturing with case examples.
- **Bullwhip Effect and Supply Chain Coordination (22m)**
Identify the bullwhip effect and learn strategies to reduce variability amplification in supply chains.
- **Sales and Operations Planning (S&OP) Process (25m)**
Integrate forecasting into business planning through a structured S&OP meeting framework.
- **Inventory Benchmarking and Performance Metrics (18m)**
Use KPIs like inventory turnover and fill rate to measure and improve inventory performance.
- **Software Simulation: Using ERP Systems for Forecasting (30m)**
Demo with common ERP software to practice demand planning and inventory management tasks.
- **Cross-Functional Collaboration in Demand Planning (16m)**
Learn to work with sales, marketing, and finance for more accurate and aligned forecasts.
- **Risk Management in Supply Chain Forecasting (24m)**
Develop plans to handle disruptions and uncertainty that affect demand and inventory stability.
- **Case Study: Reducing Inventory Costs in Pharma (28m)**
Analyze a pharmaceutical company's journey to cut inventory costs through better forecasting.
- **Implementing Demand Sensing Technology (22m)**
Use real-time data for short-term demand sensing to improve forecast responsiveness.

- **Forecasting for Global Supply Chains (20m)**
Address challenges with international operations, including currency and trade factors.
- **Ethical Considerations in Forecasting and Inventory (15m)**
Understand how to avoid bias and ensure fairness in data-driven supply chain decisions.
- **Group Project: Solving a Forecasting Dilemma (35m)**
Collaborative problem-solving exercise to apply all learned concepts to a complex scenario.

Implementation and Continuous Improvement

- **Developing a Forecasting and Inventory Plan (20m)**
Step-by-step guide to creating an actionable plan for forecasting and inventory management in your organization.
- **Change Management for New Processes (18m)**
Strategies to gain buy-in and train teams for adopting new forecasting and inventory practices.
- **Setting Up Monitoring and Control Systems (22m)**
Build dashboards and alerts to track forecast accuracy and inventory performance in real time.
- **Continuous Improvement with PDCA Cycle (16m)**
Apply the Plan-Do-Check-Act cycle to refine forecasting and inventory processes over time.
- **Integrating with Other Business Systems (20m)**
Connect forecasting and inventory management with finance, procurement, and other departments.
- **Case Study: A Manufacturer's Implementation Journey (30m)**
Learn from a real manufacturer's experience in rolling out improved forecasting methods.
- **Advanced Analytics for Continuous Optimization (25m)**
Use data analytics to identify trends and opportunities for ongoing inventory improvement.
- **Customer Feedback and Demand Signal Storage (14m)**
Incorporate end-user data and feedback to enhance forecast accuracy and relevance.
- **Scalability of Forecasting Methods (18m)**
Adapt forecasting techniques as your business grows or changes market conditions.
- **Future Trends in Supply Chain Technology (22m)**
Explore emerging technologies like AI and IoT that are shaping inventory and demand planning.
- **Personalizing Your Forecasting Approach (16m)**
Tailor methods and tools to fit your specific industry, company size, and operational context.
- **Final Exam: Comprehensive Forecasting Project (40m)**
Apply all key concepts in a complete project that simulates a real-world forecasting and inventory challenge.
- **Next Steps: Resources and Professional Development (12m)**
Discover books, online communities, and further training options to continue growing your skills.

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