

AL-FARABI KAZAKH NATIONAL UNIVERSITY

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Strategic logistics planning and inventory management strategies

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Lecture 12. Probabilistic Models and Safety Stock"

Introduction: Probabilistic models and safety stock are important concepts in inventory management, as they help companies determine how much inventory to hold in order to minimize stockouts and overstocking. Probabilistic models use statistical techniques to model demand and safety stock is an amount of inventory held in reserve to ensure adequate stock levels.

Section 1: Probabilistic Models

Probabilistic models are statistical models that use data to predict demand. Common probabilistic models include normal distribution, Poisson distribution, and exponential distribution. These models take into account the variability of demand and help companies make informed decisions about inventory levels.

Section 2: Safety Stock

Safety stock is an additional amount of inventory held in reserve to ensure adequate stock levels in the face of uncertainty or fluctuations in demand.

Safety stock helps companies minimize stockouts, which can lead to lost sales, decreased customer satisfaction, and increased costs.

Companies must balance the cost of holding safety stock with the benefits of having adequate inventory levels.

Section 3: Calculating Safety Stock

There are several methods for calculating safety stock, including the standard deviation method, the service level method, and the normal distribution method.

Each method takes into account different factors, such as demand variability and lead time, to determine the appropriate amount of safety stock.

Companies must choose the method that best fits their specific needs and take into account changes in demand and other factors that may impact their inventory levels.

Questions:

1. What are probabilistic models and how do they impact inventory management?
2. How is safety stock defined and why is it important for inventory management?
3. What are the different methods for calculating safety stock and what factors should be considered when choosing a method?
4. How do probabilistic models and safety stock work together to minimize stockouts and overstocking in the supply chain?