

Final Project Proposal

Group Members

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Description of the Problem

With the growing popularity of online furniture shopping, ensuring successful and timely deliveries has become a critical area of focus for retailers and logistics providers. Various factors, such as product category, brand, price, shipping cost, requested assembly service, and delivery window, play a significant role in determining whether an order is delivered successfully and on time.

By analyzing these factors, we can gain valuable insights into how different order attributes contribute to delivery success. This study aims to develop a predictive model that can assess and forecast delivery outcomes based on product, order, and logistics characteristics. By leveraging data-driven techniques, the model will analyze historical order data to identify patterns and relationships between order attributes and delivery performance.

The goal is to create a reliable system that can provide early risk flags for at-risk deliveries, helping businesses take proactive action (e.g., route optimization, carrier prioritization, better inventory allocation) and ultimately improve customer satisfaction and reduce operational costs.

Thus, the key objectives of this project are to:

1. Analyze how various product and logistics-related attributes influence delivery success rates.
2. Develop a predictive model to estimate the probability of successful delivery based on order features such as product category, shipping cost, delivery window, and assembly service request.

Description of the Dataset

The dataset contains 1,938 records and 14 variables, with 6 categorical and 8 numerical features. The categorical variables describe order details such as product category, subcategory, brand, assembly request, delivery status, and payment method. The numerical variables include product price, shipping and assembly costs, total amount, delivery window days, and customer rating. The target variable, delivery success, is derived from delivery status and indicates whether an order was successfully delivered or not.

Dataset: <https://www.kaggle.com/datasets/pratyushpuri/online-furniture-orders-delivery-and-assembly-2025/data>