

# Proposal

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## 1. Introduction

In the dynamic and competitive protective gear market of Poland, the ability to accurately forecast sales trends is a key strategic advantage. This project proposal outlines the creation of a machine learning model to predict future sales for a Polish trading company. Leveraging historical sales data and market intelligence, the model aims to empower the company with predictive insights for inventory and supply chain management, as well as strategic business planning.

### 1.1. Scope and Objectives

**Objective:** The goal is to develop a predictive analytics model that will allow the Polish trading company to forecast protective gear sales with high accuracy, aiding in efficient inventory management and strategic decision-making.

**Scope:**

- **Data Analysis:** Examination and analysis of historical sales data in correlation with market conditions.
- **Model Development:** Designing and training a machine learning model to predict sales volumes.
- **Deployment Strategy:** Formulating a deployment plan for integrating the model into the company's operational processes.

### 1.2. Primary Stakeholder

The primary stakeholder for this initiative is the Polish trading company. The company will provide the historical data required for model training.

### 1.3. Project Overview

#### 1.3.1 What?

We will create a machine learning model to forecast sales trends of protective gear by analyzing historical data provided by the trading company.

#### 1.3.2 Why?

The model is critical for managing inventory efficiently, minimizing waste, ensuring product availability, and enhancing the company's profitability and customer satisfaction.

#### 1.3.3 Who?

The project involves a collaborative effort between the trading company (data provider and model beneficiary), the project development team (responsible for creating the model), and academic advisors (responsible for methodological oversight).

#### 1.3.4 When?

The project timeline starts immediately upon approval, with the final deliverable due within the first 12 weeks of the semester.

#### 1.3.5 How?

The development will utilize Python, machine learning algorithms, emphasizing iterative development and model validation.

### 1.4. Conclusion

This project proposal sets forth a vision for a sophisticated predictive model that aligns with the strategic needs of the Polish trading company. The model is poised to deliver valuable foresight into the protective gear market, enabling the primary stakeholder to maintain a competitive edge.

## 2. Domain Understanding

### 2.1. Introduction

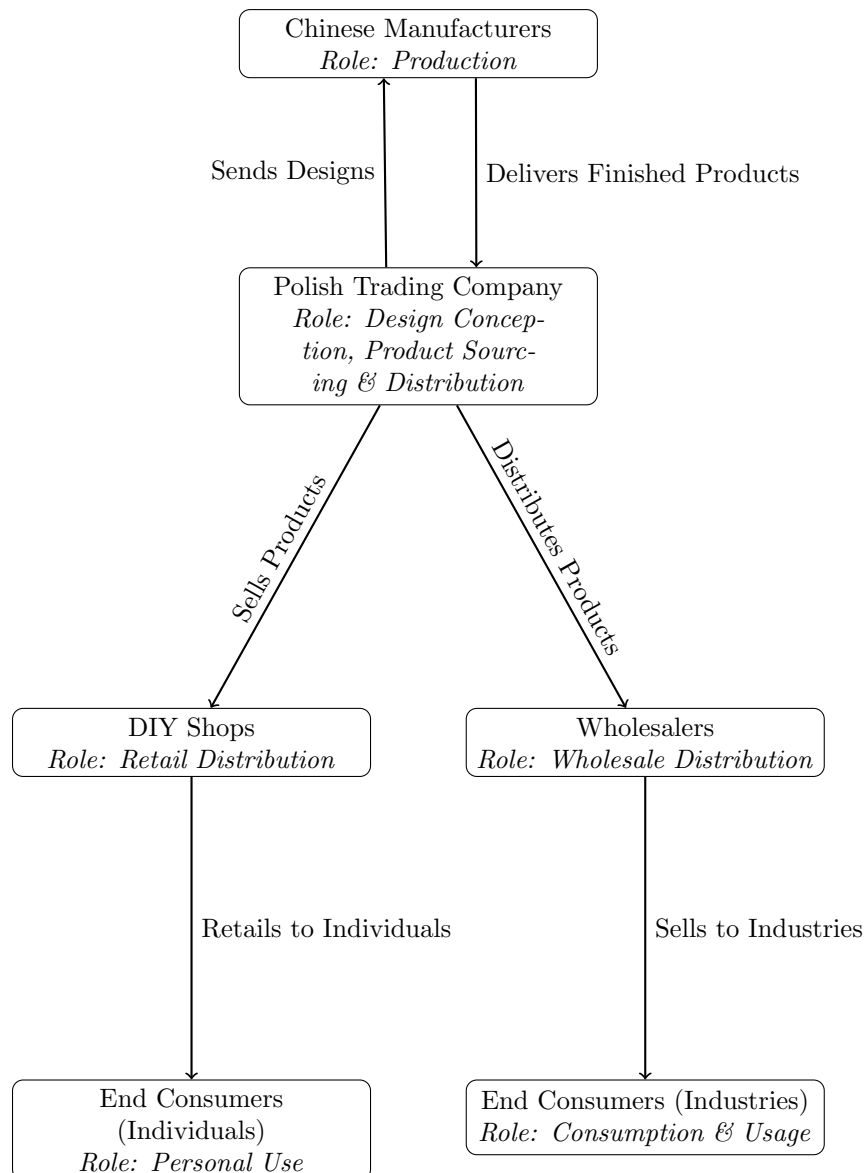
Poland's apparel market offers a wealth of opportunities for businesses. It's a vibrant and diverse landscape where tradition meets modernity. Success in this realm requires a deep understanding of product categories, effective sales strategies, and an awareness of the myriad external factors that influence sales. This document aims to provide an in-depth understanding of the various nuances of the Polish apparel market.

### 2.2. Business Model

The company operates based on a direct sourcing and distribution model, which can be described in the following steps:

1. **Product Design and Sourcing:** The company either sources pre-designed products or creates custom designs tailored to specific needs. For custom designs, the company conceptualizes the design and then collaborates with manufacturing entities in China to bring these designs to life.
2. **Production:** With the designs in hand, the products are then manufactured in specialized factories located in China. These factories are equipped to produce protective gear that meets both the design specifications and any required safety standards.
3. **Distribution and Sales:** Once the products are manufactured and ready for the market, the company takes on the role of distributor. They sell these products to:
  - DIY shops, like Leroy Merlin.
  - Wholesalers who specialize in the distribution of protective gear.
4. **End Consumers:** The DIY shops and wholesalers, in turn, sell these products to the end consumers. The primary target for these products are companies that require protective gear for their industrial operations. However, there is also a retail segment where individual consumers can purchase these products for personal use.

Here is visualization of above described business model:



### 2.3. Key Considerations

- **Sales Planning:** Preparation is crucial. When approaching large retail chains, businesses must anticipate their needs. This might mean bolstering their workforce in advance of significant sales events, ensuring that customer demands are met efficiently.
- **Market Trends:** Poland boasts a unique blend of local and international fashion preferences. Recognizing and catering to this balance can set a business apart, allowing them to connect more effectively with their target audience.

### 2.4. Categorizing Apparel

Understanding the different categories of apparel can help businesses strategize effectively.

#### 2.4.1 By Demand

- **Seasonal Apparel:** Products like winter jackets and summer sandals are influenced by the changing seasons. Anticipating these shifts can lead to optimized sales.
- **Evergreen Apparel:** Certain staples, such as t-shirts and jeans, are consistently in demand, making them essential inventory items.

## 2.5. By Function

- **Upper Body Wear:** This category, including jackets and shirts, is vast and caters to both daily wear and specific occasions.
- **Headgear:** From fashionable hats to protective helmets, this category serves both function and style.
- **Leg Wear and Protection:** Beyond daily wear like trousers, this category also includes specialty items like protective gear.

## 2.6. Effective Sales Approaches

- **Bundling Products:** Offering products as sets, such as a jacket with matching gloves, can enhance sales appeal. Such bundles can offer customers better value and enhance their shopping experience.
- **Identifying Target Audiences:** A clear understanding of the target market, whether it's the general public or niche groups, can lead to more tailored and effective sales strategies.

## 2.7. Influences on Sales

Numerous external factors can sway consumer purchasing decisions.

- **Economic Climate:** The broader economic health can influence consumer spending habits, with downturns leading to more conservative buying behavior.
- **Fashion Shifts:** The ever-evolving world of fashion can drastically impact the popularity of certain apparel items.
- **E-commerce Trends:** As the digital age progresses, online shopping continues to reshape traditional buying patterns.
- **Regulatory Environment:** Changes in government regulations, trade policies, or import/export tariffs can affect both sales and manufacturing practices.
- **Sustainability Concerns:** With increasing global emphasis on eco-friendly practices, sustainable and ethically-produced apparel is gaining traction.

## 2.8. Understanding Sales Data

Data-driven insights can greatly benefit businesses.

- **Data Source:** The sales data under discussion originates from a specific trading company, providing a snapshot of its market performance.
- **Leveraging Data:** Analyzing this data can offer invaluable insights into consumer behavior, future trends, and areas of improvement. This allows businesses to refine their strategies and anticipate market shifts.

## 2.9. Conclusion

The apparel market in Poland is both challenging and rewarding. For businesses to thrive, they must stay informed, adaptable, and proactive. With the right blend of market understanding, sales strategy, and responsiveness to external influences, success is not just possible—it's probable.

### **3. Data Sourcing**

#### **3.1. Objectives**

#### **3.2. Data Requirements**

#### **3.3. Data Sources**

#### **3.4. Data Legality and Ethics**

#### **3.5. Data Diversity**

#### **3.6. Version Control**

### **4. Analytic approach**