**PREDICTIVE DEMAND FORECASTING FOR RETAIL BUSINESSES**

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## Introduction

The retail industry has been evolving rapidly over the past few years due to technological advancements and changes in consumer behaviour. One of the key challenges that retail businesses face is forecasting demand accurately. Traditional demand forecasting methods are often based on historical data and lack the ability to factor in market trends and other external factors. As a result, retail businesses often face the issue of overstocking or understocking products, leading to waste and lost revenue.

The goal of this business model is to provide retail businesses with an AI-based product/service for predictive demand forecasting that can help them optimize their inventory levels, reduce waste, and increase profits. This report outlines the business model and the key steps involved in developing the AI product/service.

## Customer Segments:

The AI-based predictive demand forecasting product/service will be particularly beneficial for businesses that operate in the following industries:

1. Apparel and fashion: The fashion industry is highly seasonal, with trends changing rapidly. Accurate demand forecasting can help businesses to optimize their inventory levels and avoid overstocking or understocking products.

2. Grocery and food: The food industry is highly perishable, and businesses need to manage their inventory carefully to avoid waste. Accurate demand forecasting can help businesses to optimize their ordering and inventory management processes, resulting in less waste and increased profits.

3. Electronics and technology: The electronics industry is highly competitive, and businesses need to stay on top of changing trends to remain relevant. Accurate demand forecasting can help businesses to stay ahead of the curve and make informed decisions about their product offerings.

4. Home goods and furnishings: The home goods industry is highly seasonal, with demand for certain products increasing during specific times of the year. Accurate demand forecasting can help businesses to optimize their inventory levels and avoid overstocking or understocking products.

## Value Proposition:

The AI-based predictive demand forecasting product/service will provide retail businesses with the following key value propositions:

1. Accurate demand forecasting: Accurate demand forecasting is crucial for retail businesses to optimize their inventory levels and avoid stockouts and overstocking. By using AI to analyze historical sales data, market trends, and other relevant factors, the product/service can provide accurate demand forecasts to businesses. This will help businesses plan their inventory levels and purchasing decisions more effectively, leading to reduced waste and increased profits.

2. Inventory optimization: The product/service will provide businesses with recommendations for optimizing their inventory levels based on demand forecasts. This will help businesses reduce waste by avoiding overstocking and stockouts. By optimizing inventory levels, businesses can increase their profits by minimizing the cost of carrying excess inventory while also ensuring that they always have enough stock to meet customer demand.

3. Real-time insights: In today's fast-paced retail environment, real-time insights are essential. The product/service will provide businesses with real-time insights into changing market trends and consumer behavior. This will help businesses stay ahead of the competition by quickly adapting to changes in the market and customer behavior.

4. Customizable dashboards and reports: The product/service will provide businesses with customizable dashboards and reports that can be tailored to their specific needs. This will make it easier for businesses to access the insights and data they need to make informed decisions. Customizable dashboards and reports will also help businesses identify trends and opportunities that they may have missed otherwise.

5. Seamless integration: The product/service will seamlessly integrate with existing POS and inventory management systems. This will make it easy for businesses to adopt the product/service without disrupting their existing workflows. Seamless integration will also ensure that businesses have access to all the data they need to make informed decisions

## The Revenue Streams:

The revenue streams for forecasting sales for Walmart will be generated through the subscription-based pricing model. The pricing model will be divided into different tiers based on the size of the business and the level of service required. This will ensure that the product/service is affordable for businesses of all sizes while providing Walmart with a reliable stream of recurring revenue.

The subscription model will provide customers with access to the AI-based predictive demand forecasting product/service, as well as support and training. The subscription will be renewed annually or monthly, depending on the preference of the customer.

Walmart may also generate additional revenue streams by offering customized consulting services to customers who require more personalized support. Consulting services may include customized data analysis, inventory optimization, and business strategy development. These consulting services will be provided on a per-project or hourly basis, depending on the scope of the project and the needs of the customer.

Walmart may also consider offering value-added services such as marketing analytics, pricing optimization, and customer segmentation to provide a comprehensive suite of services to its customers. These value-added services can be offered at an additional cost and will help Walmart stand out from its competitors by providing a more holistic solution to its customers.

Overall, the subscription-based pricing model will be the primary revenue stream for forecasting sales for Walmart, supplemented by additional revenue streams such as consulting services and value-added services.

## Key Resources:

In order to develop and launch the AI-based predictive demand forecasting product/service, Walmart will require a range of key resources to ensure the success of the venture. These resources include:

1. Data scientists and machine learning engineers: These professionals will be responsible for developing the machine learning algorithms and analytics tools used to analyze sales data and generate demand forecasts. They will be tasked with building a robust and reliable system that can provide accurate forecasts to businesses of all sizes.

2. Cloud-based services: The product/service will be built using cloud-based services such as AWS, Google Cloud Platform, or Microsoft Azure. These platforms provide scalable and reliable infrastructure that can support the development, deployment, and management of machine learning models and analytics tools.

3. Development tools: The product/service will be developed using Python, which is a popular language for data analysis and machine learning. Walmart will require a team of skilled developers who are proficient in Python to build and maintain the product/service.

4. Sales and marketing professionals: The team will be responsible for promoting the product/service and generating new business. Walmart will require a team of experienced sales and marketing professionals who can effectively communicate the value proposition of the product/service to potential customers.

5. Customer support and training: The team will be responsible for providing ongoing support and training to customers. This will include answering questions, providing technical support, and ensuring that customers are able to make the most of the product/service.

Overall, the key resources required to develop and launch the AI-based predictive demand forecasting product/service for Walmart include a team of data scientists and machine learning engineers, cloud-based services, development tools, sales and marketing professionals, and customer support and training. By leveraging these key resources, Walmart can ensure the success of the venture and provide its customers with a valuable and reliable predictive demand forecasting product/service.

## Key Activities:

Additionally, some key activities involved in the AI-based predictive demand forecasting product/service can be listed as follows:

1. Data Collection: This involves collecting relevant data from various sources such as point-of-sale systems, inventory management systems, market trends, and consumer behavior.

2. Data Preparation: This activity involves cleaning and preparing data for analysis, which may include removing irrelevant data, handling missing data, and normalizing data.

3. Data Analysis: This activity involves using machine learning algorithms to analyze historical sales data, market trends, and other relevant factors to generate accurate demand forecasts.

4. Platform Development: This activity involves developing and maintaining the platform, which includes developing new features, fixing bugs, and ensuring security and scalability.

5. Marketing and Sales: This activity involves promoting the product/service to potential customers through various channels such as digital marketing, trade shows, and industry events.

6. Customer Support: This activity involves providing ongoing support to customers through online tutorials, webinars, and personalized consulting services to ensure customer satisfaction.

7. Training: This activity involves providing training to customers to ensure that they can effectively use the product/service to generate accurate demand forecasts and optimize their inventory levels.

## Channels:

Walmart can leverage its existing channels to promote and distribute the AI-based predictive demand forecasting product/service. Walmart can use its existing network of retail businesses as potential customers, offering the product/service as a value-added service to improve their business operations. Walmart can also leverage its online marketplace to promote the product/service, as well as its physical stores by showcasing the benefits of the product/service to its customers.

Walmart can also collaborate with other companies in the retail industry, such as point-of-sale system providers, inventory management software providers, and logistics companies. By partnering with these companies, Walmart can offer the predictive demand forecasting product/service as an integrated solution, making it easier for retail businesses to adopt and use the product/service. This can also help Walmart expand its customer base and increase revenue streams.

## Cost Structure:

The cost structure for developing and launching the AI-based predictive demand forecasting product/service will include the following costs:

1. Data storage and computing costs: The product/service will be built using cloud-based services, which will incur ongoing storage and computing costs.

2. Personnel costs: The team will require data scientists, machine learning engineers, sales and marketing professionals, and customer support and training staff.

3. Development tools: The product/service will be developed using Python and other data analysis and machine learning tools.

4. Overhead costs: The business will incur ongoing overhead costs

## key metrics:

To elaborate further on key metrics for the AI-based predictive demand forecasting product/service for retail businesses, the following KPIs could also be considered:

1. Revenue growth: Measuring the revenue growth of the business will help determine the effectiveness of the product/service in increasing profits.

2. Customer satisfaction: Measuring customer satisfaction through surveys and feedback will help understand if the product/service is meeting customer needs and expectations.

3. Time to value: Measuring the time it takes for customers to see value from the product/service will help determine if the onboarding and training process is efficient and effective.

4. Conversion rate: Measuring the conversion rate of leads to customers will help determine the effectiveness of the marketing and sales strategy.

5. User engagement: Measuring user engagement through metrics such as active users, frequency of use, and time spent using the product/service will help understand how customers are using the product/service and identify areas for improvement.

6. Return on investment (ROI): Measuring the ROI of the product/service will help determine if the benefits outweigh the costs for customers and the business.

## Conclusion:

In the case of Walmart, the implementation of this product/service could lead to significant cost savings and revenue growth. By accurately forecasting demand, Walmart could reduce its inventory levels and avoid stockouts, leading to cost savings. In addition, the product/service could help Walmart identify new market trends and consumer behaviour, leading to new revenue opportunities.

The key to success will be ensuring the accuracy of the demand forecasts and providing a seamless user experience for customers. This can be achieved by investing in data scientists and machine learning engineers to develop and refine the machine learning algorithms, as well as investing in customer support and training to ensure customers are effectively using the product/service.

Overall, the potential benefits of the AI-based predictive demand forecasting product/service for Walmart and other retail businesses are significant, and the business model outlined in this report provides a solid framework for developing and launching this product/service.

References:

Kaggle. (n.d.). Walmart Recruiting - Store Sales Forecasting. Retrieved from

https://www.kaggle.com/c/walmart-recruiting-store-sales-forecasting/data

GitHub Link –

https://github.com/akshaykaradkar/Feynn_labs_intern/blob/main/Task_0/Predictive_Sales_Analysis_Walmart.ipynb