SMART INDIA HACKATHON 2024

Problem Statement ID:1647

Problem Statement Title: Development of AI-ML based models for predicting prices of agri-horticultural commodities such as pulses and vegetable (onion, potato, onion)

Theme: Agriculture, FoodTech & Rural Development

PS Category: Software

Team ID:5

Team Name: Prune

Development of AI-ML based models for predicting prices of agri-horticultural commodities such as pulses and vegetable (onion, potato, etc,)

AI-ML models can reduce price volatility in agricultural commodities, improving market predictions and decision-making for stakeholders.

Unique Value Proposition

The AI-ML dynamic model combines weather and market data for accurate price forecasts, reducing volatility and improving decision-making in India's agricultural market.

How is it solving the problem

Price prediction model:

Time Series Analysis:

Integration of Market and Weather Data:

Proposed Algorithms

- Long Short-Term Memory Networks (LSTM)
- Temporal Fusion Transformers (TFT)
- Hybrid Models (e.g., CNN-LSTM)
- Gradient Boosting Machines (GBMs)

Cost-effectiveness:
Due to the automation and scalability, AI-ML models are more affordable over the long run, but they may require large upfront expenditures in data infrastructure and model training.

Practicality:
The increasing digitisation of agriculture in India makes it possible to integrate meteorological and market data through technological breakthroughs, the Internet of Things, and government efforts.

Market Demand:
Frequent price volatility is the cause of the significant need for price prediction tools, making the solution essential for traders, farmers, and policymakers.

Challenges & Mitigation Strategies:
Data Accessibility: Accuracy may be impacted by partial or inconsistent meteorological and market data.
Strategy: For real-time, comprehensive data, collaborate with public and private data providers.

Black Marketing: The possibility of using black marketing or market manipulation to take advantage of price fluctuations.
Strategy: Integrate government regulations with real-time monitoring and transparency tools, and maintain ongoing oversight to identify and stop manipulation.

Impact and Benefit on users

Improved decision-making: The tool's accurate predictions and predictive features allow users to buy, sell, and store commodities with more knowledge.

Reduced risk: By providing insights on market trends and potential disruptions, the tool can help lower the risks associated with fluctuations in commodity prices.

Enhanced effectiveness: Resource allocation and waste can be minimised with the use of inventory management solutions.

Enhanced transparency: The large amount of data and government monitoring capabilities may lead to a more fair and transparent commodity market.

Possible Advantages

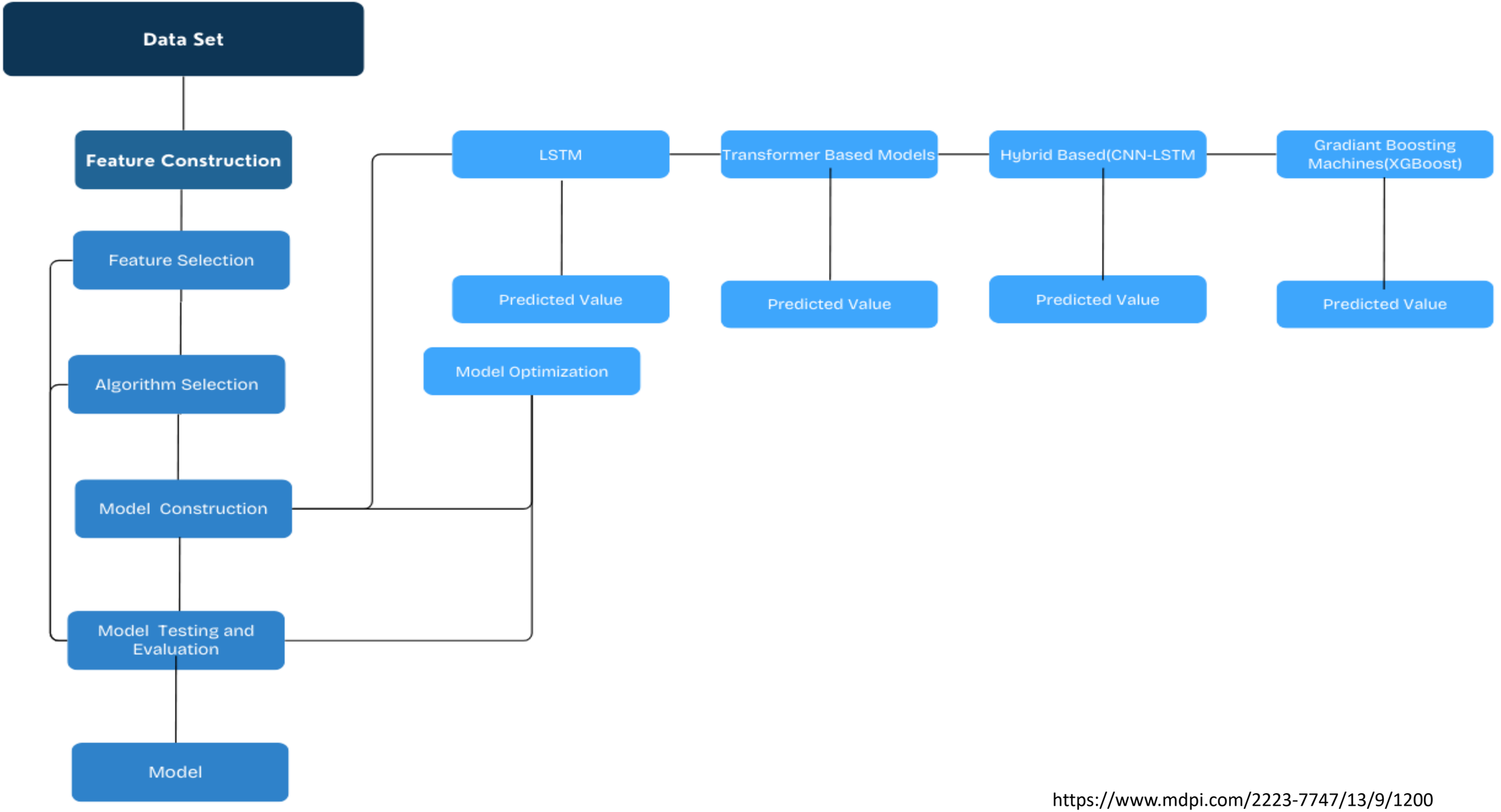
Decision Making: More precise predictions and insights for better decision-making.

Lower risk: Reducing the dangers associated with changes in pricing.

Enhanced effectiveness: Enhanced inventory control.

Increased openness: Promotes a more equitable market.

Sustainability in the economy and environment: Encourages sustainable behaviour.



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