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- **Problem Statement ID -** **1647**
- **Problem Statement Title -** AI-ML models for predicting prices of pulses and vegetables (onion, potato).
- **Theme -** Agriculture, FoodTech & Rural Development
- **PS Category-** Software
- **Team ID -** **FOTIH24_123**
- **Team Name (Registered on portal) -** Cluster Innovators

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AgriWatch

Real Time Price Monitoring & Forecasting

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❖ Proposed Solution

A. AI-ML Based Price Prediction Model

- **Algorithm-Driven Forecasting**: Uses advanced **AI-ML algorithms** like ARIMA, LSTM, and Random Forest for accurate price predictions.
- **Comprehensive Data Inputs**: Integrates data from **historical trends**, **seasonality**, and **market intelligence** for better decision-making.

B. Cross-Platform Availability (App & Website)

- **Real-Time Access**: The solution is accessible via a **mobile app** and **website**, allowing users to monitor prices and trends from any device.
- **User-Friendly Design**: Offers an intuitive interface for both **government officials** and **farmers**, featuring **region-specific price reports** and **visual analytics**.

❖ Innovation & Uniqueness

a. **Timely Decision-Making**: By providing **early and accurate price forecasts**, the solution helps prevent sudden price spikes or drops, allowing the government to release **buffer stocks** strategically and maintain market balance.

b. **Reduced Manual Dependency**: Automates data analysis by incorporating **AI-driven insights**, cutting down the reliance on manual methods and speeding up the response to market volatility.

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TECHNICAL APPROACH

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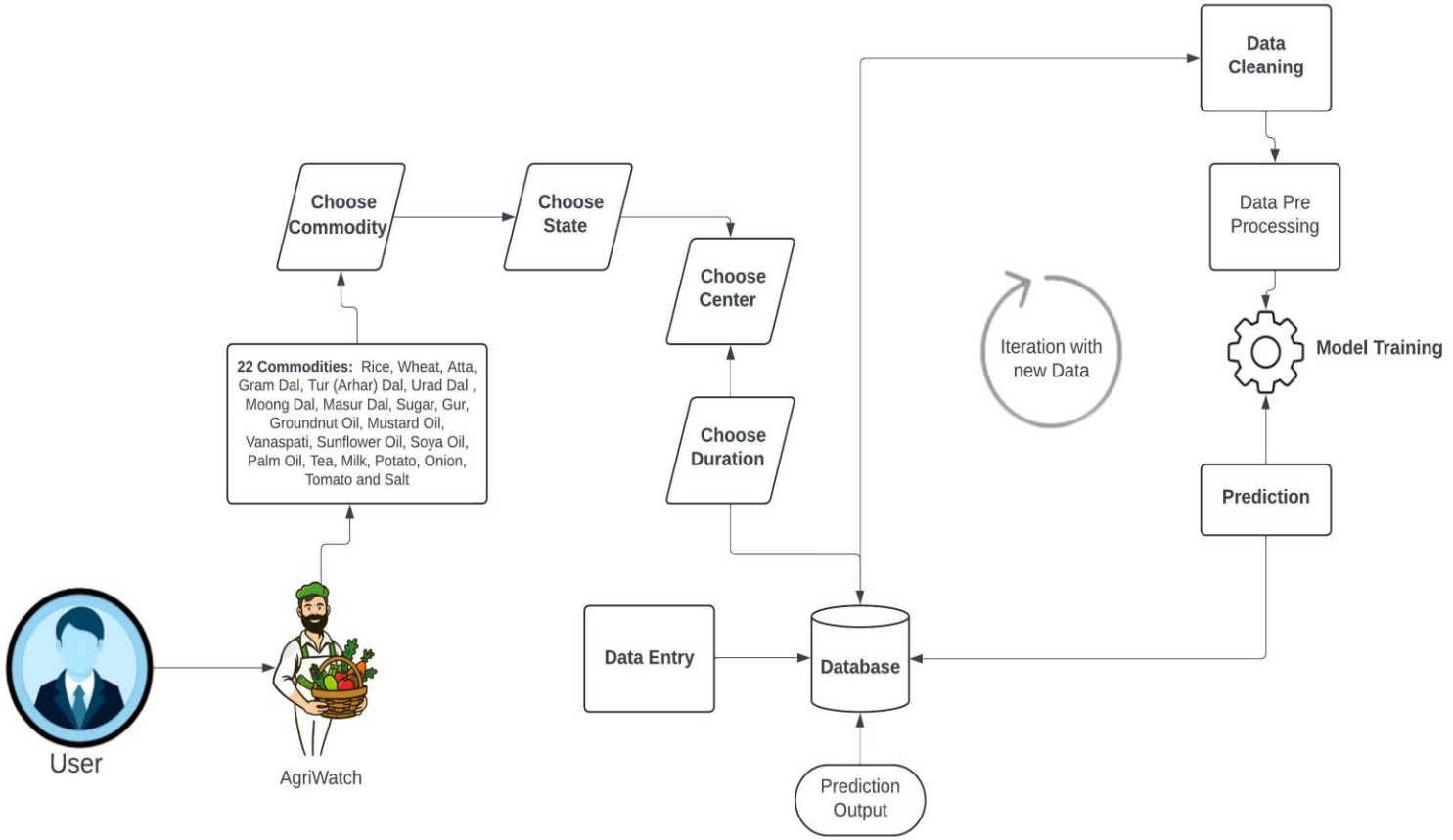
Technology Stack

Work Flow Diagram



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FEASIBILITY AND VIABILITY

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❖ Feasibility

- **Technological Feasibility**: The solution uses **proven AI-ML models** like ARIMA, LSTM, and Random Forest, which are well-established in time-series forecasting and can be easily implemented with existing data.
- **Data Availability**: With access to **550 price reporting centers** and historical data on commodities, there's a reliable data foundation to build accurate models.

❖ Potential Challenges and Risks

- **Data Gaps and Inconsistencies**: Inconsistent or missing data from some price reporting centers could impact the accuracy of predictions.
- **Market Volatility**: Sudden, unexpected market factors (e.g., natural disasters, international price fluctuations) may cause prediction inaccuracies.

❖ Strategies for Overcoming These Challenges

- **Data Validation & Preprocessing**: Implement data cleaning techniques and use **machine learning algorithms** that can handle missing or noisy data.
- **Adaptive Algorithms**: Employ **real-time learning models** that continuously adapt to new data, making the system responsive to sudden market changes and improving the reliability of predictions.

IMPACT AND BENEFITS

❖ Positive Impact on the Target Audience

- **Government Decision-Makers**: Provides real-time insights for **strategic market interventions**, leading to better **management of buffer stocks** and stabilization of commodity prices.
- **Farmers and Consumers**: Farmers can **optimize crop selling times**, while consumers benefit from **stable food prices**, reducing the risk of sudden price hikes

❖ Benefits of the Solution

- **Economic Benefits**: Reduces **price volatility**, stabilizing markets and protecting both **farmers' incomes** and **consumer purchasing power**.
- **Social Benefits**: Ensures **food security** by maintaining stable prices of essential commodities, positively affecting **household food budgets** and preventing inflation.
- **Environmental Benefits**: Encourages more **sustainable farming practices** by helping farmers plan crop cycles based on market demand, potentially reducing **wastage** and **overproduction**.

RESEARCH AND REFERENCES

- https://www.data.gov.in/catalog/dailyweekly-wholesale-prices
- Kaur, M., Gulati, H., & Kundra, H. (2014). Data mining in agriculture on crop price prediction: Techniques and applications. *International Journal of Computer Applications, 99*(12), 1-3. https://doi.org/10.5120/17422-8273
- Santosa, E., Taufik, M., & Fadhil, A. (2023). Agricultural price prediction models: A systematic literature review. *ResearchGate*. Retrieved from https://www.researchgate.net/publication/375503481_Agricultural_Price_Prediction_Models_A_Systematic_Literature_Review