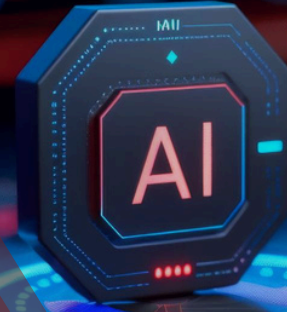


AI-Powered Commodity Price Prediction Engine

Driving Data-Led Pricing Decisions with 30-Day
Forward Visibility



Client Overview

A leading India-based integrated sugar manufacturing enterprise operating multiple production units and serving a diverse customer base including large corporates, FMCG players, beverage companies and independent traders. The business operates in a highly regulated and volatile commodity environment influenced by government quotas, seasonal cycles and fluctuating demand patterns.

Business Challenges

Delayed market visibility

Pricing decisions were based on weekly reports and retrospective analysis, creating a 3–5 day lag behind market movements

Margin erosion

Lack of forward visibility led to suboptimal pricing decisions and reduced profitability

Inefficient inventory management

Reactive decisions resulted in excess stock during price drops and shortages during spikes

Unstructured procurement timing

No systematic way to identify optimal buying windows

Regulatory complexity

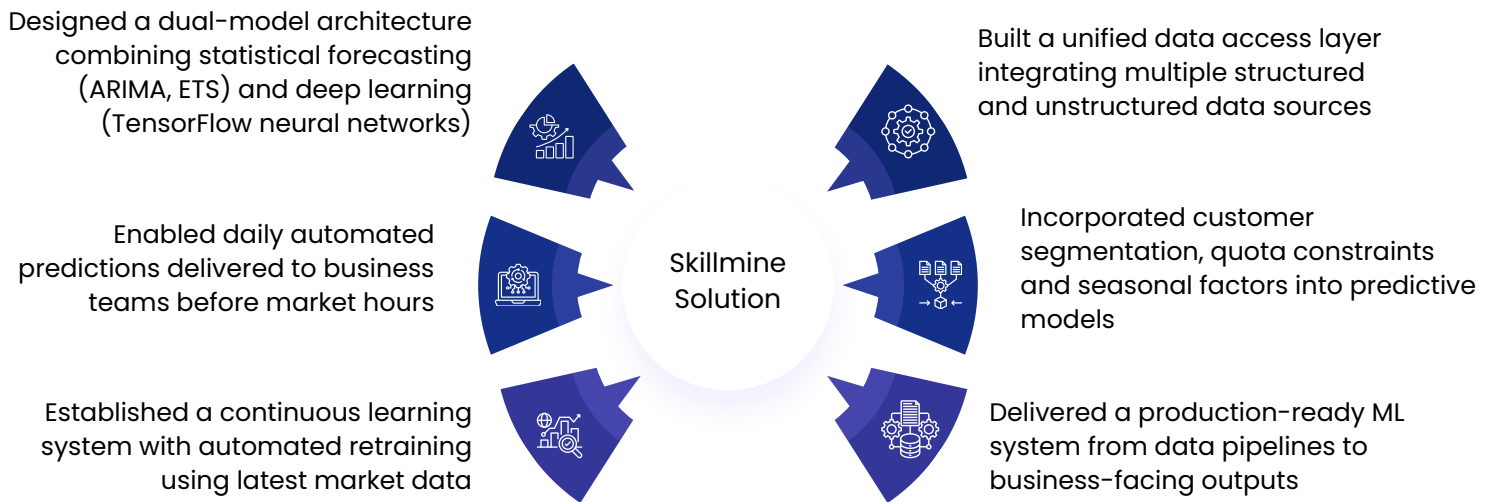
Government quota constraints were not integrated into pricing decisions

Competitive disadvantage

Sales teams relied on intuition while large buyers used advanced analytics

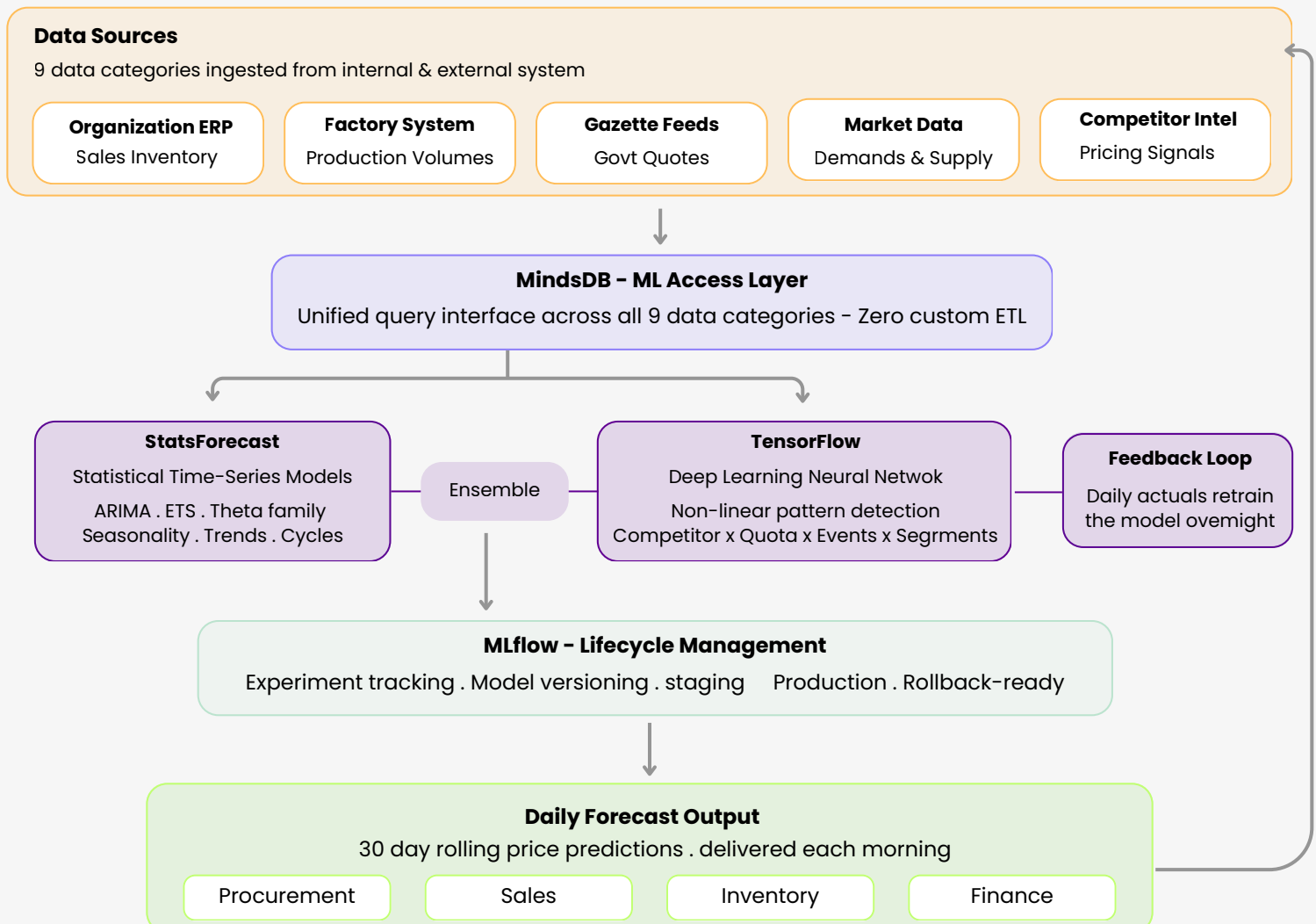
Skillmine Solution

An AI-powered daily price prediction engine delivering 30-day forward forecasts with high accuracy, enabling proactive and data-driven decision making.



Solution Architecture

AI-Powered Daily Sugar Price Prediction Engine



Implementation Approach



Data Consolidation

- Aggregated 9 critical data categories including demand, supply, competitor pricing, quotas and seasonal influences
- Built a standardized and unified data schema across legacy systems



Feature Engineering

- Developed advanced features such as supply-demand ratios, competitor price gaps, seasonal indicators and quota utilization metrics
- Applied normalization, encoding and derived feature creation for model readiness



Model Development

- Statistical models to capture trends, seasonality and cycles
- Neural network models to capture non-linear relationships
- Ensemble approach to improve prediction accuracy



Validation & Testing

- Backtesting across historical datasets and multiple market scenarios
- Continuous performance tracking using MAE and MSE



Production Deployment

- Automated daily retraining using latest available data
- Real-time prediction delivery to procurement and sales teams
- Version-controlled and scalable ML lifecycle

Challenges Overcome



Data Standardization Across Sources

Resolved inconsistencies in formats, units and definitions by building a centralized validation and normalization layer



Customer Segmentation Insight

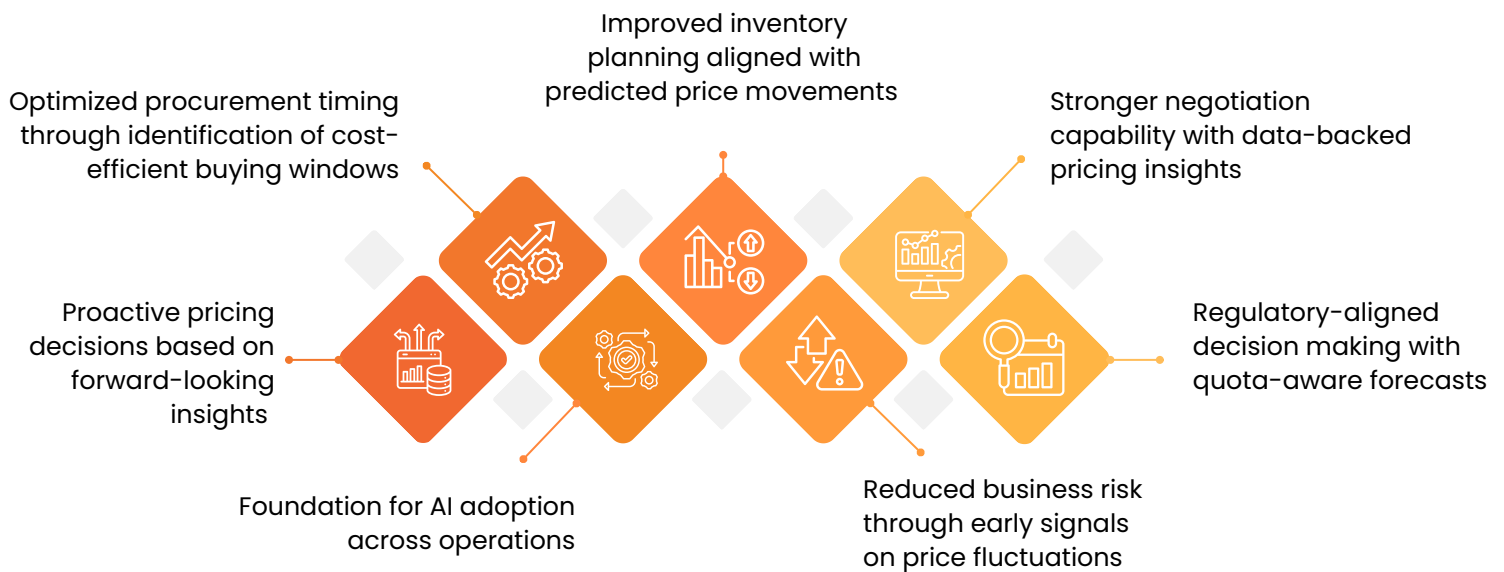
Improved model performance significantly by incorporating customer-specific behavior patterns into predictions



Dynamic Quota Adjustments

Enabled real-time reflection of quota changes through an adaptive adjustment layer without delaying predictions

Business Benefits



Key Data Points

97%

prediction accuracy on out-of-sample data

30 days

forward forecast horizon updated daily

9 data

integrated across the ecosystem

5

competitors tracked for pricing signals

12 weeks

from concept to production deployment

1

production system enabling daily automated retraining

Technology Stack

TensorFlow

StatsForecast
(ARIMA, ETS) orFlow

MindsDB

MLflow

Capability & Competency

- ☒ Time-Series Forecasting & Predictive Analytics
- ☒ Multi-source Data Integration
- ☒ Deep Learning Model Development
- ☒ Production ML Deployment
- ☒ Feature Engineering & Data Transformation
- ☒ Commodity Pricing Intelligence

For more information
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