

# Ganga Diary: Empowering Village and Urban Entrepreneurs with IOT-Enabled Transparency

## Introduction

The traditional milk supply chain has plagued by opacity, unfair pricing, and middlemen exploitation. To address these challenges and create a sustainable ecosystem for both village farmers and urban entrepreneurs, our team embarked on a Flutter project leveraging cutting-edge IOT sensors.

The primary aim was to create a platform ensuring real-time measurement of milk quality, leading to fair compensation based on purity and freshness. This case study encapsulates our journey, highlighting the transformative impact of this innovative solution.

## Background

The milk industry traditionally operated with inherent inefficiencies, particularly in the determination of fair pricing. Farmers, especially in rural areas, faced challenges due to lack of transparency in assessing the quality of their produce, leading to unfair compensation. Simultaneously, urban entrepreneurs struggled to procure high-quality milk consistently, relying on intermediaries whose pricing often lacked clarity.

**Technology Used:** Flutter, Bloc, Provider, MVVM, Get Storage, SQL Lite, Dart

## Solution:

Our team conceptualized and developed a comprehensive Flutter application integrated with IoT sensors. These sensors, placed at various stages of milk production, measured crucial parameters such as fat content, freshness, and purity in real-time. The app acted as a bridge connecting village farmers directly with urban entrepreneurs, ensuring transparency and fair pricing.

## Implementation:

- IoT Integration:** We integrated state-of-the-art IOT sensors at each procuring point - from milk extraction at the farm to transportation and delivery to urban areas. These sensors continuously monitored and transmitted data regarding milk quality to the centralized app.
- Data Analytics:** Leveraging machine learning algorithms, the app processed incoming data swiftly, providing accurate assessments of milk quality. Parameters such as fat percentage, bacterial count, and temperature were analyzed in real-time, ensuring freshness and purity.
- User-Friendly Interface:** The Flutter-based application was designed with a user-centric approach, offering an intuitive interface for both farmers and urban entrepreneurs. Farmers could input data regarding their milk production, while urban users could access real-time quality reports and place orders seamlessly.
- Transparency and Fair Pricing:** By eliminating middlemen and providing direct access to quality metrics, the app ensured fair compensation for farmers based on the actual quality of their

produce. Simultaneously, urban entrepreneurs received reliable, high-quality milk at transparent prices.

### **Results:**

1. **Empowered Farmers:** Village farmers experienced a significant increase in income due to fair pricing based on the quality of their milk. This led to improved livelihoods and encouraged sustainable farming practices.
2. **Quality Assurance:** Urban entrepreneurs benefitted from consistent access to high-quality milk, thereby enhancing the quality of their products and services
3. **Elimination of Middlemen:** The removal of intermediaries minimized operational costs and ensured a more direct, transparent trade between stakeholders
4. **Sustainable Ecosystem:** The ecosystem fostered by the app promoted ethical practices, transparency, and mutual benefit among all stakeholders, fostering a sustainable milk trade.

### **Conclusion**

The integration of Flutter application and IOT sensors in our project revolutionized the milk trade ecosystem. It empowered village farmers, enriched urban entrepreneurs and fostered a transparent, equitable environment beneficial for all. By ensuring fair compensation based on real-time quality assessments, our solution redefined the way milk is traded, setting a new standard for transparency and value creation in the industry.