

AI-Driven Supply Chain Optimization System with Real-time Tracking

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Introduction / Background

- Supply chains are the backbone of logistics.
- Traditional systems lack adaptability and real-time data.
- AI enables predictive and efficient supply chain management.
- Cloud allows real-time tracking and decision-making.

Problem Statement

- Inefficient inventory leads to high costs.
- Lack of real-time tracking affects customer satisfaction.
- Traditional systems can't handle fluctuating demand efficiently.

Objectives

- Forecast product demand accurately.
- Optimize inventory levels.
- Enable real-time tracking using cloud.
- Improve supply chain responsiveness.

Literature Review / Market Research

- Existing ERP systems offer limited AI capabilities.
- Companies like IBM and Amazon use AI in logistics.
- This system integrates forecasting with real-time tracking.

Methodology / Approach

- Data Collection → Forecasting → Optimization → Tracking
- Tools: Python, ML Models, Cloud, IoT
- Visuals: Flowcharts/block diagrams used to explain system flow

Implementation / Development

- Phase 1: Data Preprocessing & Forecasting
- Phase 2: Inventory Optimization
- Phase 3: Real-time Dashboard (Cloud)
- Phase 4: Tracking Integration (APIs/IoT)

Results / Output

- Forecast accuracy improved significantly.
- Inventory costs reduced.
- Real-time dashboard functional.
- Screenshots and graphs included.

Challenges Faced

- Incomplete or noisy data.
- Real-time data integration.
- Optimization of training time.
- Resolved with preprocessing and testing.

Future Scope

- Blockchain for data security.
- RFID/drones for logistics.
- SaaS model for industry-wide use.

Conclusion

- AI optimizes supply chains effectively.
- Real-time cloud tracking adds value.
- Demonstrated efficiency and transparency.

References / Acknowledgments

- IEEE, Springer research papers
- Tools: Scikit-learn, Pandas, Firebase
- Thanks to mentors and project guides