Sales Forecasting Using Blockchain and AI-Driven Automation

Abstract

Sales forecasting is an essential aspect of business strategy, allowing companies to optimize inventory, manage supply chains efficiently, and enhance customer satisfaction. Traditional forecasting techniques rely on historical sales data and statistical models, which often fail to adapt to real-time market changes. In this project, we propose an advanced **AI-driven sales forecasting system** that integrates **Blockchain technology, Predictive Analytics, and Cloud-based Machine Learning Models** to enhance accuracy, transparency, and automation.

The system leverages **Deep Learning models (LSTMs, Transformer-based models like Time-Series BERT)** to analyze historical sales patterns and predict future demand. **Blockchain technology** ensures transparency and security in data sharing among suppliers, retailers, and manufacturers. Smart contracts built on **Ethereum or Hyperledger Fabric** automate the tracking of sales transactions, preventing data manipulation and fraud.

The model is trained using **Google AI Platform (AutoML), AWS Forecast, and Microsoft Azure ML**, allowing for real-time cloud-based analytics. It incorporates **external factors such as economic indicators, social media sentiment, and competitor pricing** to make more accurate predictions. **Reinforcement Learning (RL)** is implemented to fine-tune inventory management strategies dynamically, ensuring optimal stock levels.

To improve decision-making, an **AI-powered chatbot assistant** provides real-time sales insights and forecasting reports to business stakeholders. Future work includes the integration of **Edge AI devices for IoT-based inventory monitoring** and **Federated Learning to allow multiple businesses to collaborate on AI models without sharing sensitive data**.