FINSIGHT AI: CONVERSATIONAL FINANCIAL MARKET INTELLIGENCE ENGINE

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Abstract:

FinSight AI is an NLP-based system designed to extract insights from unstructured financial text such as news, reports, and market commentary. It integrates sentiment analysis, topic modeling, named entity recognition, emotion detection, and a retrieval-based chatbot. Using ML models like TF-IDF, Logistic Regression, spaCy, and NMF, the system identifies market sentiment, themes, entities, and emotions. It enables faster, intelligent decision-making through a conversational AI interface.

PROBLEM STATEMENT:

Financial markets generate huge volumes of text data every day—too complex and time-consuming to analyze manually.
Organizations need automated tools to:

- Understand market sentiment
- Discover trending financial topics
- Identify important entities (companies, CEOs, currency values)
- Detect public emotions around events
- Provide instant, interactive insights to users

OBJECTIVES/USE CASES:

- Detect sentiment (positive, neutral, negative)
- Extract key entities (ORG, PERSON, MONEY, DATE)
- Identify trending topics in financial news
- Detect emotions like fear, anger, trust, joy
- Build an Retrieval-based chatbot for financial explanations

METHODOLOGY

Data Preprocessing:

Cleaning → Tokenization → Stopword removal → Lemmatization → TF-IDF

NLP Techniques

- NMF (Topic Modeling)
- spaCy (NER)
- TF-IDF

ML Models Used:

- Logistic Regression
- LightGBM
- SVM
- Naive Bayes

RESULTS & INSIGHTS

- Sentiment Analysis achieved strong performance (~85–90% accuracy), correctly identifying positive, negative, and neutral market tones.
- Topic Modeling (NMF) revealed major financial themes such as market volatility, company earnings, stock performance, and crypto trends.
- NER (spaCy) accurately extracted key entities including companies, CEOs, dates, and monetary values, enabling structured financial insight.
- Emotion Detection captured investor emotions like fear, joy, anger, and trust, especially around major financial events.
- Support Chatbot showed high semantic-matching accuracy, providing clear explanations for financial terms and user queries.

CONCLUSION & FUTURE WORK

FinSight AI successfully demonstrates how multiple NLP models can work together to automate the understanding of financial text.

It improves the speed and accuracy of financial decision-making by generating sentiment, topics, emotions, entities, and intelligent responses via a chatbot.

Future Enhancements:

- Integrate FinBERT and transformer-based models
- Real-time live news processing
- Deploy using Flask / FastAPI

THANK YOU