JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

TRADELOGX: AN AI-ENHANCED AUTOMATED TRADING JOURNAL AND ANALYTICS PLATFORM FOR THE INDIAN EQUITY MARKET

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Abstract : In Indian stock market the participation of the retail traders has Increased a lot in the past few years. Recent data from the Securities and Exchange Board of India(SEBI)shows that over 90% of the traders in Future & Options(F&O)segments are in net losses.Why?Because they don't know their behavioural mistakes.This research describes a platform (TradeLogX) designed to improve the performance of retail traders in the stock market. Where, user can record their trades with important details such as emotions during the trade, trade details, key points like reason for entry and exit, strategy and outcomes. The objective is to improve trading skills and to increase the profit of trader by providing the trader's behaviour and decision-making, a deterministic "Prediction Meter" enabling better strategy development and more disciplined trading. The platform is built upon a robust MERN (MongoDB, Express.js, React, Node.js)architecture .TradeLogX has a Generative AI summariser powered by Google's Gemini API.10 by automating the trade data and providing a qualitative feedback through Large Language Models(LLMs). TradeLogX helps the retails traders to change from gambling trading to data-driven professional trading.

IndexTerms - **Artificial Intelligence, Trading Journal, Behavioral Finance, MERN Stack, Indian Stock Market, Technical Analysis, Sentiment Analysis, Risk Management, Generative AI**.

I. INTRODUCTION

A. Background

After the pandemic, Indian financial market has changed a lot. And Due to the pandemic lots of the brokers started giving discount on their platforms, many retail traders entered the market in the last few years. Trading in the market has become very easy now anyone can open an account and start trading in the market from their phone. Even after this big participation most retails trader still not get profitable. As per SEBI reports, around 90-93% of individual trader make a loss in equity

(F&O)segments between FY22-FY2024 and in derivatives loss is almost double.

The main reason behind these losses is not indicators or strategy, but psychology. As retail traders do not follow rules strictly. Many times, after a loss they do is only revenge trading so that they can recover the loss in quick time and on same day. Some traders hold the loosing trades and hoping that market will move in their favour. These are the some reason due to which losses get increased. Many traders track their trades in Excel, paper genuinely which is not enough. As these only shows numbers, not the reason behind the trade. Mostly they do not track their emotions and psychologically state. Because of this reason they are not aware of their mistakes mentally and they keep repeating the mistakes.

B. Problem Statement

In the today time tools which available for retail traders are clearly divided into two parts. Firs, most traders journalize their trade on excel or manual journaling on books which are time consuming and risk of wrong entry. These journaling methods lack analytic and emotional factors of the trades excluding the basic calculations of profits and losses. And on the other hand there are advanced platform that provide powerful insight but with higher charges. These platforms are not used by retail traders in India. There is not any system which combines the technical ,psychological factors and AI driven feedback specifically for the Indian market.

C. Objectives

TradeLogX addresses this "Feedback Gap" by leveraging Generative AI and Web Technologies. The specific objectives of this research are:

1. **To Develop a Unified Analytics Ecosystem:** MERN-based platform integrating for trade logging, technical analysis, and psychological tracking.
2. **To Democratize AI Coaching:** Utilizinng the Gemini API to provide automated, context-aware summaries of trading days.
3. **To Quantify Trading Psychology:** Introducing a methodology for tagging and aggregating emotional states to correlate psychology with P&L.

4. **To Implement Deterministic Validation:** Develop a "Prediction Meter" using algorithms like RSI and MACD for trade confirmation.

II. PURPOSE AND PROBLEM DEFINITION

A. Operational Pain Points

The primary purpose of TradeLogX is to solve the operational friction inherent while journaling.

Data Fragmentation: Currently traders switch between many trading apps, charting tools, and notebooks. TradeLogX centralizes this workflow for tracking of trades and analysis.

Calculation Errors: Manual calculation of advanced metrics like **R-Multiples** and **Expectancy** is prone to error in spreadsheets.

Lack of Accountability: Without risk management, retail traders often break their own rules. AI acts as a "virtual mentor," it reviews trades and highlight deviations from the plan.

B. System Purpose

The system provide functions as a Decision support system(DSS) not just acting as a basic trade journal. Here traders are required to entry not only prices but also the strategy they were using and their emotional state at the time of entry, exit and during the trade. Over the time system provides a data of the trader performance, for example, trader was assuming that he is profitable in derivatives options but actual data is showing that he is in the breakeven point.

III. SCOPE

A. Functional Scope

Market Focus: This platform is now only for the **National Stock Exchange (NSE)** and **Bombay Stock Exchange (BSE)**, utilizing Indian Rupee (₹).

Core Modules:

- **Dashboard:** TradeLogX will Display cumulative P&L, Win Rate, and Equity Curve.
- **Journal:** System provides a CRUD interface to log their trades with rich text notes and chart screenshots.
- **AI Coach:** Generative text analysis of daily performance.
- **Prediction Meter:** Technical analysis engine.
- **Psychology Tracker:** Emotion tagging and aggregation.

B. Technical Scope

Frontend: React.js 18 (Vite), Tailwind CSS, Recharts.

Backend: Node.js, Express.js.

Database: MongoDB Atlas (Cloud).

External APIs: Google Gemini API (AI), Alpha Vantage/Yahoo Finance (Market Data).

C. Limitations

The system is designed to improve trading skills it does not place or execute any live orders in the market. Real time data usage is restricted by API rate limits. The prediction meter is strictly designed for educational purpose it should not be treated as an investment tip or any financial advice.

IV. EXISTING SYSTEM / LITERATURE REVIEW

A. Traditional Journaling

Many traders still depend on Excel or paper based journals to keep and track their trades. It is flexible but comes at a cost of data reliability. Lack the capability to analyse the inputs, making it difficult to extract behavioral or psychological patterns.

B. AI in Finance

Existing literature on the use of artificial intelligence in finance has primarily concentrated on price prediction models, particularly using LSTM networks, or on algorithmic trade execution. In contrast, the use of Large Language Models (LLMs) for behavioral coaching remains a relatively unexplored area. Recent studies indicate that LLMs such as Gemini and GPT-4 perform well in summarizing financial text and detecting sentiment, which makes them suitable for analyzing trader-written notes. TradeLogX leverages these capabilities by applying them directly to a user's personal trade journal data.

C. Trading Psychology

Overconfidence and loss aversion is the key cognitive biases in the behavioral finance research which shoes the it have a strong impact on retail traders performance in the market. However, most existing tools do not directly link these psychological factors with actual financial outcomes. TradeLogX addresses this gap through its "Psychology Meter," which translates key insights from trading psychology literature into measurable and actionable digital indicators.

V. SYSTEM DESIGN AND ARCHITECTURE

TradeLogX is built upon a **decoupled monolithic MERN-based architecture**, which provides a balanced approach to security, scalability, and maintainability within the system design.

A. Architecture Overview

1. **Presentation Layer (Client):** Built with **React.js** and **Vite** for a responsive User Interface (UI). It utilizes **Recharts** for visualizing performance data and **Tailwind CSS** for styling.
2. **Application Layer (Backend):** A **Node.js** runtime with **Express.js** handles API requests. It implements **JWT (JSON Web Token)** based authentication to ensure stateless, secure sessions.
3. **Data Layer (Database): MongoDB** (NoSQL) is used for its schema flexibility, allowing the storage of heterogeneous trade data (stocks vs. options) and unstructured JSON logs for the AI.[27]
4. **Integration Layer:** Secure interfaces for communicating with the **Google Gemini API** and market data providers.

B. Key Modules

Auth Service: Handles Registration, Login, and Password Hashing (bcrypt).

Trade Service: Manages CRUD operations and calculates P&L automatically upon saving.
AI Service: Sanitizes trade data and constructs prompts for the Gemini API.
Analytics Engine: Aggregates data using MongoDB pipelines to calculate Win Rate, Average Risk-Reward, and Profit Factor.

VI. METHODOLOGY & ALGORITHMS

A. AI Summarizer (Generative Analysis)

The core innovation is the integration of the Gemini API to act as a qualitative analyst.
Data Serialization: The system converts the day's trade records into a structured JSON string.
Prompt Engineering: A specific "System Instruction" is used: "You are an experienced trading psychologist and risk manager. Analyze the following JSON trade logs. Be critical but constructive. Focus on risk management violations.".
Output: The LLM generates a Markdown-formatted report highlighting key strengths and weaknesses.

B. Psychology Tracking Algorithm

Users tag trades from a controlled vocabulary: Fear, Greed, FOMO, Revenge, Boredom, Confident.
System calculates the Emotional Expectancy (E_{tag}):
$$E_{tag} = \frac{\sum (\text{P\&L of Trades with Tag})}{\text{Count of Trades with Tag}}$$
This metric mathematically reveals which emotions are most costly to the trader.

C. Performance Analytics

We implement institutional metrics to measure efficiency:
R-Multiple: $R = \frac{\text{Exit} - \text{Entry}}{\text{Entry} - \text{StopLoss}}$. This normalizes performance across different stock prices.
Profit Factor: $\frac{\text{Gross Profit}}{\text{Gross Loss}}$. A value > 1.5 it typically indicate a profitable system.

D. Prediction Meter (Technical Validation)

The Prediction Meter provides a Weighted Composite Score based on standard technical indicators:

1. RSI Component: If $RSI < 30$ (Oversold) $\rightarrow$ Bullish Signal.
2. MACD Component: If MACD Line crosses above Signal Line $\rightarrow$ Bullish Momentum.
3. Trend Component: If Current Price > 50-day SMA $\rightarrow$ Uptrend.

The final score (0-100%) acts as a confluence check for the trader.

VII. IMPLEMENTATION DETAILS

A. Tech Stack

Frontend: React 18, Vite, Lucide-React (Icons), Axios.
Backend: Node.js v18, Express.js.
Database: MongoDB Atlas.
AI: Google Generative AI SDK (@google/generative-ai).

B. Security Practices

JWT Authentication: Stateless tokens are used for managing the session of users, preventing the need for server-side session
Environment Variables: Sensitive keys (Gemini API Key, Mongo URI) is securely via .env files and kept out of codebase.
Input Validation: strict Mongoose schema validation is applied to enforce data types and protect against NoSQL injection attacks.

VIII. RESULTS AND DISCUSSION

A. Qualitative Results

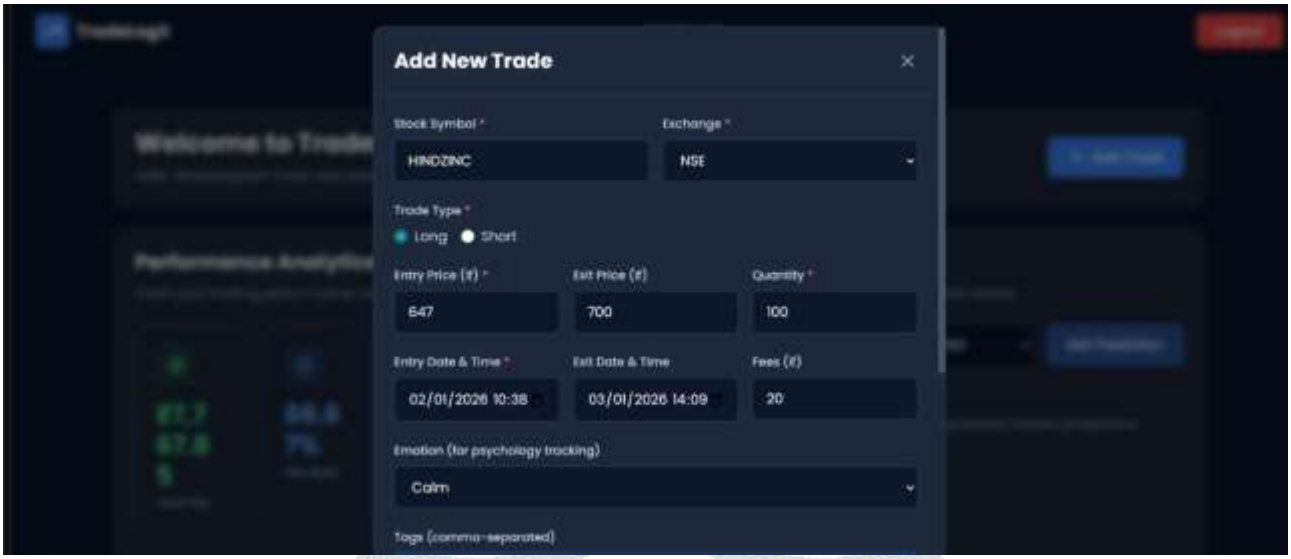
While tagging the emotions in each trade entry it create psychological pause which reduces the unwanted, unplanned, fear of missing out(FOMO), fear, greed and poor trades based on emotions. The AI Summarizer make the trader accountable, which is similar to having a human mentor for reviewing work.

B. Result

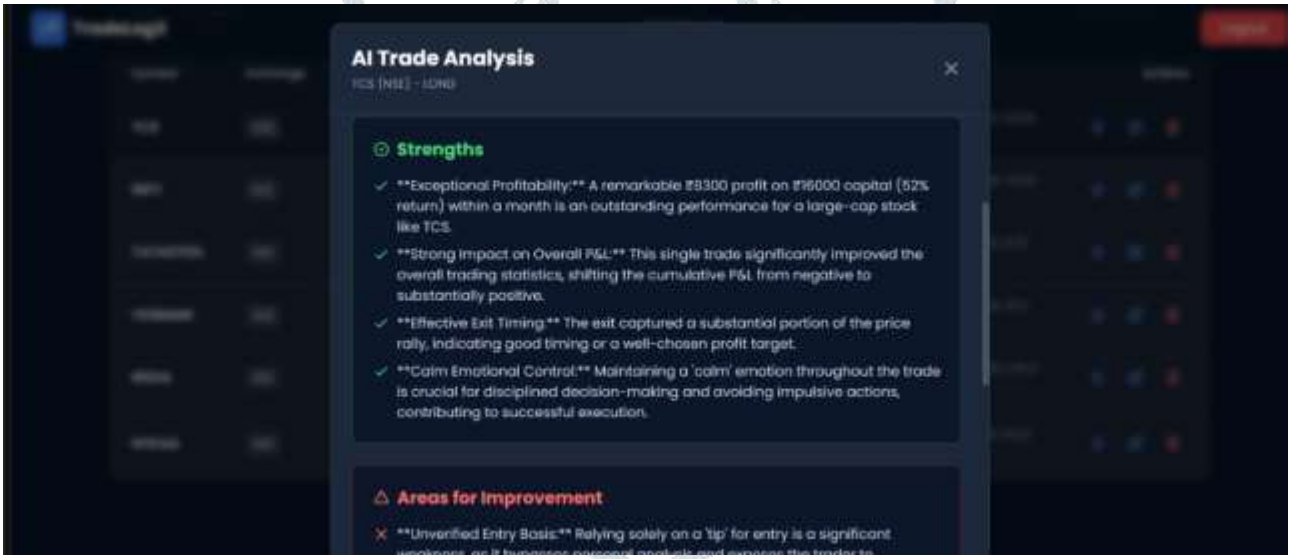
Traditional spreadsheet-based journals is not that worth ,on the other hand TradeLogX automates repetitive journaling tasks and integrates intelligent analysis to enhance trader self-evaluation

Adding Trade details

Fig. VIII.1



AI Trade Analysis



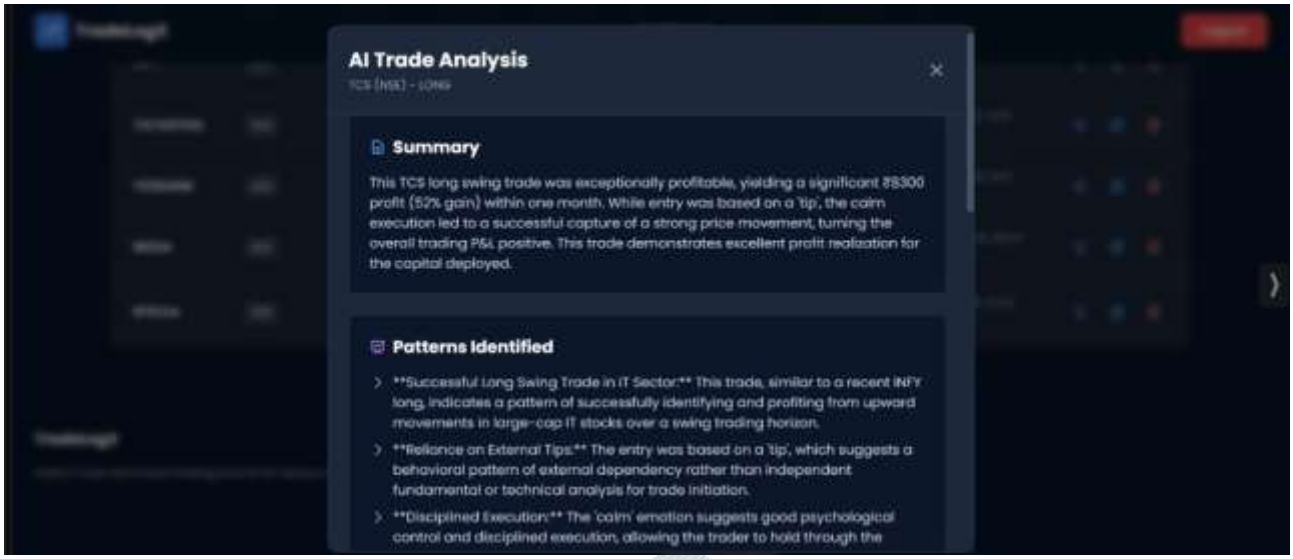


Fig. VIII.2

IX. CHALLENGES AND SOLUTIONS

A. AI Hallucinations

Large Language Models (LLMs) may occasionally misinterpret numerical data. To mitigate this limitation, TradeLogX performs all financial computations—such as profit and loss (P&L) and win rate—deterministically within a Node.js backend. These computed values are then supplied to the LLM as fixed factual inputs, constraining the model's role to qualitative analysis and commentary.

B. Data Privacy

For addressing data privacy concerns, system anonymizes all information transmitted to the Gemini API by removing user-identifying attributes and encrypts all stored data at rest within MongoDB.

X. CONCLUSION AND FUTURE WORK

TradeLogX demonstrates the applicability of modern software engineering techniques to behavioral finance challenges. By integrating the MERN stack with generative AI, the system extends beyond passive data recording to provide actionable insights that support improved trading discipline and decision-making among retail traders.

In Future we will develop a React Native–based mobile application to enable on-the-go journaling and the integration of broker APIs, such as Zerodha, to facilitate real-time trade data acquisition.

XI. ACKNOWLEDGMENT

We express our sincere gratitude to our project guide, **Mr. Pratharv Surve**, for his continuous support and valuable insights. We also thank **Department of Information Technology** at **ZSCT's Thakur Shyamnarayan Degree College** for providing the necessary infrastructure.

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