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**Project Definition Document (PDD)**

**Degree title:** BSc. Computer Science

**Project name:** Forcastock

**Project title:** Machine Learning-Enhanced Predictive Trading: Developing an Educational and User-Centric Stock Market Prediction Simulation Application for Enhanced Financial Literacy and Decision-Making

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***Arrangements for proprietary interests:*** *None*

**Word count:**

# Problem to be solved

The challenge addressed by this project includes the need to provide an engaging environment for individuals interested in (day-) trading. Current trading platforms may lack features that promote regular participation, skill development, and sustained user engagement. Key issues include:

1. **Insufficient Day Trading Practice Tools:**
   * Existing trading platforms may not adequately cater to users seeking a dedicated space for day trading practice and skill enhancement.
2. **Lack of Daily Educational Engagement:**
   * Users may face challenges in accessing consistent and engaging educational content related to day trading, hindering their continuous learning and improvement.
3. **Motivational Gaps:**
   * The absence of gamified elements and motivational structures may lead to a lack of sustained interest and commitment among users to regularly participate in day trading simulations.

Solving the above three issues aims to transform day trading practice into a dynamic and educational experience, motivating users to develop their skills and stay engaged with the platform daily while increasing their knowledge on how to increase financial capital. Furthermore, the stock prediction will involve machine learning techniques to ensure reliable test results. Users will not only enhance their day trading skills but also gain insights into market trends, contributing to a comprehensive and dynamic learning experience.

# Objectives

## Single Main Objective

The main objective of this project is to apply machine learning for live market stock prediction and provide users with a simulated trading experience on a demo account which can be initiated by the user.

Sub Objectives

The end product will be a web app designed to provide users with a seamless experience in simulated stock trading. Users will have the ability to securely log in using their email addresses and create a personalized demo trading environment. Within this environment, users can actively engage by placing trades and interacting with the dynamic stock market while also receiving stock price predictions for the selected stock. The platform aims to offer a user-friendly interface and a comprehensive set of features to mimic real-market scenarios, allowing users to refine/practice their trading strategies in a risk-free setting. The ultimate goal is to deliver an immersive and educational experience that combines the excitement of trading with the practicality of learning, fostering a deeper understanding of financial markets.

*Project Beneficiaries*

The trading application outlined in this project will benefit various stakeholders.

1. **End Users (Individual Traders):**
   * *How They Benefit:* Individual traders will experience an enriched trading experience with access to a platform powered by machine learning for live stock predictions. The simulated trading environment on the demo account enables risk-free skill development, strategy testing, and continual learning, enhancing their proficiency in day trading.
2. **Developers in Financial Technology and Machine Learning:**
   * *How They Benefit:* Developers specializing in financial technology and machine learning will gain valuable insights and hands-on experience in implementing innovative features. The project involves intricate technical aspects, contributing to the growth of expertise within the developer community.
3. **Academic Community:**
   * *How They Benefit:* The academic community gains from the practical application of machine learning in financial technology. The project results contribute to academic endeavours, serving as a valuable resource for students, researchers, and projects exploring the intersection of machine learning and stock trading.
4. **Stock Market Enthusiasts:**
   * *How They Benefit:* The community of stock market enthusiasts benefits from the trading application's features, including educational content, advanced analytics, and simulated trading. The project aims to elevate the overall understanding of day trading and market dynamics, catering to the interests of a broad audience.

# Work Plan

The development of this project will be guided by the Agile software development methodology. The project will be organized into sprints, each lasting between 10 to 14 days, to accomplish specific project goals within these defined timeframes. Throughout the entire project duration, notes will be taken during consultations, research findings, and discussions on programming methodologies. Regular testing of the Forcastock software will be conducted, with detailed documentation of the testing process.

I plan to write and update the final project report after the completion of each sprint. This iterative reporting process ensures a real-time reflection on progress, challenges faced, and lessons learned during the development phases.

While I am confident in the feasibility of this project, I acknowledge the necessity for thorough research on frameworks, particularly Django used for this project, and machine learning models.

The Gantt Chart and associated dates provide a visual representation of the project timeline. The order of responsibilities with shown dates is respective to the bar order displayed on the Gantt Chart.

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*Project Risks*

There are several project risks when it comes to developing Forcastock:

1. **Technical Complexity:** The integration of machine learning models and real-time market data into the platform may introduce technical complexities. Unforeseen challenges in implementing these technologies could delay the project.
2. **Research of new Technologies:** While it is highly unlikely that I have underestimated the time required to learn specific aspects of the project if this occurs, there may be a need to prioritize the essential features of the platform, potentially sacrificing additional functionalities like adding streaks or additional trading functionality to ensure a minimum viable product
3. **Data loss:** Over the whole course of the project, the code will be constantly pushed to a private GitHub repository
4. **Lack of Expertise:** If the developer lacks experience in financial markets, trading, or machine learning, there is a risk of overlooking critical aspects of the project. I believe to have sufficient knowledge to implement this platform as I have some experience as a trader and have navigated the real market before.
5. **User Financial Risk Considerations:** Forcastock poses no risk to its potential users. However, should users interpret its predictions as financial advice and make consequential decisions, such as investments, there is a potential risk of financial loss. To mitigate this, it will be explicitly communicated that Forcastock is designed as an educational tool and should not be seen as an encouragement for users to make investment decisions based on its findings.

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26/01/2024 PDD and Gantt Chart

Today I have written up some of the PDD and also initiated the work plan which is the Gantt chart for all the tasks that need to be solved. Created the cover page

27/01/2024 Gantt chart started watching Django/react tutorials for development

28/01/2024 Worked on the login page with basic Django templates, still need to apply css to style respective pages

29/01/2024

Django implemented custom usermodel “pip install django-use-email-as-username” to only have email authentication. Managed to make email authentication (registration) work. Now login needs to be fixed to ensure that the user logs in as well.

30/01/2024

*References*