HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATION AND COMMUNICATION TECHNOLOGY

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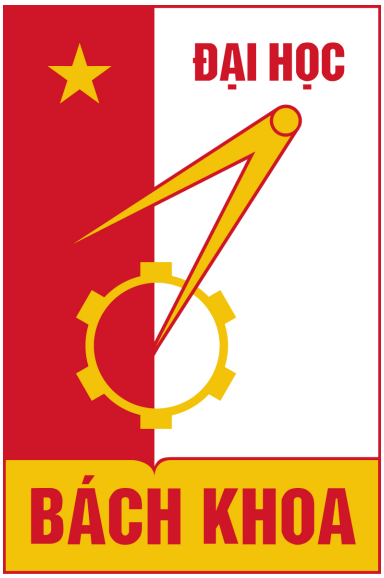

PROJECT FEASIBILITY STUDY REPORT

Subject: Introduction to Software Engineering

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I. SUMMARY OF ACTIVITIES

The user is someone who wants to get familiar with the stock market. The client is Mr. Trinh Thanh Trung's company.

The goal is to help users get acquainted with the stock market and introduce them to the brokerage company SoICT Stock. The system supports online stock trading and personal portfolio management. The objective is to digitize the stock trading process, promote the brokerage company SoICT Stock, and generate profit for them.

II. PRELIMINARY REQUIREMENT ANALYSIS

1. APPLICATION OVERVIEW

1.1. Objectives

The basic function of the software is to collect real-time information about stocks issued by virtual companies, allowing users to buy and sell these stocks. Additionally, these stocks will operate as closely as possible to real-world market conditions, helping users become familiar with the highly volatile stock market.

The software's primary function is to gather information on stocks issued by virtual companies listed on the stock exchange, allowing users to place buy and sell orders using a demo account with a predefined amount of simulated money. Additionally, it dynamically simulates stock prices to closely mirror real-world market conditions based on preset rules. This provides users with a hands-on experience, helping them adapt to the highly volatile nature of the stock market.

1.2. Business Goals

The software aims to promote SoICT Stock, create a simulated market environment for users to practice before engaging with a real trading application from the brokerage company, and help the company earn revenue from transaction commissions.

Additionally, help them generate profits through software sales or premium features within the software

1.3. Business Process

Before the advent of online trading platforms, investors who wanted to buy or sell stocks had to first open an account with a brokerage firm. They would then place orders by calling a broker, providing stock codes, the number of shares, and the desired price, or by physically visiting the brokerage office to fill out a stock order form. The broker or an employee of the brokerage firm would then manually enter the order into the trading system. This traditional process required investors to travel to brokerage offices, incurred high fees, and posed risks regarding the credibility of the brokerage firms. Additionally, completing a trade took significant time, and brokerage firms had to hire many employees to handle order entries. The new software will address these issues by providing investors with an online platform where they can complete traditional processes digitally without the need for a broker or physical visits to brokerage firms. Moreover, the software will help brokerage firms reduce staff costs and enhance their growth.

1.4. User Roles and Responsibilities

The system will have two types of users: buyers and administrators.

- Anonymous Users: Can only view stock prices.
- Signed-in Users: Can own purchased stocks, place buy/sell orders, track their investment portfolio, monitor the market, deposit funds, and link bank accounts.
- Administrators: Manage users, adjust market conditions, cancel or reset simulations, add new virtual companies, monitor unusual login activities, and open/close trading sessions.

1.5. Considerations for Deployment

- Designing and developing a centralized database system.
- Deploy on cloud platform for cost effective and easy scalable.
- The system will be designed and implemented in stages over three months before its official launch.
- The stock simulation mechanism must be carefully examined to ensure it meets expectations.

2. FUNCTIONALITY REQUIREMENTS

2.1. Functional Declaration

The system provides an interface for users to place trade orders. Users can manage their transactions through features such as viewing, buying, selling, and monitoring market fluctuations. The software will be accessible from anywhere, with an estimated concurrent usage of six users at any given time. The software must protect user information through various security measures. It should also categorize companies based on industry (healthcare, education, etc.) to help users easily choose stocks.

2.2. Security and User Access

Anonymous Users are trial users who are only allowed to view stock movements. The signed-in user must log in or register for an account before they can acquire stocks, make buy/sell orders, track their investment portfolio, monitor the market, deposit funds, or link their bank accounts. Administrators can manage users, change market conditions, cancel or reset simulations, add new virtual companies, monitor unusual login activity, and open/close trading sessions.

2.3. Reports

We aim to schedule the report at regular intervals, ideally every two weeks, as per our theoretical plan. This schedule is intended to ensure consistent progress tracking and timely updates.

2.4. Optional Features

- Premium accounts can access AI-based stock trading advice and recommendations, advanced charts and analysis tools.
- Leaderboards for investor competition.

- Future Trading: Take long (buy) or short (sell) assets at a predetermined price on a specific future date. This allows traders to speculate on price movements without owning the actual assets.
- Mini-games with vouchers as rewards for stock purchases.
- Cryptocurrency trading like Bitcoin, ETH
- Margin trading: allows users to borrow money to trade larger positions than their actual capital
- A general chat channel for investor communication and a forum, market related daily news for knowledge sharing.
- Personal achievement boards.

2.5. Usability

- Stock price charts must update quickly and continuously.
- Trade order placement must be convenient and efficient.

2.6. Scope

The software will operate within the legal framework of Vietnam, ensuring that unlawful activities (such as insider trading or stock dumping) cannot be performed.

This project focuses on developing a trading platform, not a stock exchange, with functionalities limited to displaying stock data and enabling users to place buy/sell orders. It will not handle real exchange-level processes like order matching, manipulate pricing, or transaction execution. While real-world platforms must work with stock exchanges like HOSE or HNX, this system will simulate order execution using simplified if-else logic based on custom rules, omitting ACID compliance and complex protocols, and the stock price is based on our own defined rules. The goal is to demonstrate core user-facing trading features without replicating actual exchange infrastructure.

III. PROCESS TO BE FOLLOWED

Agile (Scrum) will be used as the software development methodology due to the constantly changing stock market and the need to rapidly respond to user requirements. This approach allows for quick experimentation and user feedback. User stories will be used to define the main functions of the software, while a product backlog will prioritize which functions to develop first to meet customer needs.

IV. SUGGESTED DELIVERABLES

1. **Regular progress reports:** Keeping clients updated on project progress, detailing added or modified features.
2. **Periodic presentations:** Demonstrating developed and developing features visually so clients can provide feedback for necessary adjustments.
3. **User documentation:** Providing guidance on software usage, features, roles, and user permissions.

V. TECHNICAL FEASIBILITY

Technical Requirements:

1. **Realistic market rules:** Bots/virtual users will create simulated transactions with unpredictable rules. Consideration for "whale" accounts to influence and steer the market.
2. **Virtual companies:** Companies can issue stocks, generated randomly or manually by the development team.
3. **Security:** Implement password protection, hashed password storage, using HTTPs, advanced encryption algorithms and prevent SQL injection, Command injection, XSS CSRP, etc. Two-factor authentication (2FA) via email or Face ID can also be added.
4. **Performance:** Able to process a huge amount of requests within an acceptable time to ensure app responsiveness. Consider using a load balancer and a CDN for the best user experience.

A proposed development stack includes PostgreSQL for the online database, React and CSS for the frontend, and Python or Node.js for the backend. Cloud services may be considered if feasible.

VI. VISIBILITY

1. **Communication:** Meetings will take place in person at classroom D8-406 from 6:45 to 10:05 AM every Tuesday or via Teams for project updates. The class's "Discuss with Clients" channel on Teams will be used for client discussions, while Messenger, Discord, or in-person meetings will be used for internal team discussions.
2. **Interim documentation and presentations:** A final in-class presentation will be conducted at the end of the semester to report progress, along with a live demo. Clients will also receive a technical report detailing key project information.

VII. RISK ANALYSIS

1. **Time Risks** The project is expected to be completed within three months. Due to client interactions, some optional features may not be implemented.
2. **Resource Risks** If cloud services are considered, there may be financial constraints as high-performance cloud services often require fees. Using an online database may slow down trade execution, impacting user experience.
3. **Functional Risks** The system may not be optimized as expected, with minor unforeseen bugs. However, the team is confident in addressing any functional issues promptly.
4. **Risk Mitigation Management** A detailed monthly plan is being developed to ensure timely project completion. Frequent client interactions will help refine the product to meet user needs.

VIII. COMMITMENTS AND TERMS

1. **User Data Privacy:** The software will comply with national regulations to protect user rights. Personal information such as names, ages, transaction history, and linked bank accounts will be secured through industry-standard measures.

2. **Copyright and Branding:** The team will grant a limited license to SoICT Stock. Users of SoICT Stock will have access rights, and Mr. Trịnh Thành Trung will have unrestricted modification rights. The team is not responsible for any modifications after handover. However, the team retains the right to use the software demo for job applications and to showcase it as a collaborative project.

IX. CONCLUSION

Based on the feasibility analysis, the development team believes that the virtual stock trading simulation project is technically viable with the team's skill set. Given the three-month timeline, the team is confident in meeting client requirements. The final report confirms that proceeding with this software project is feasible.