TurkTrade Stock Market Website and Mobile Application Development

Software Requirements Specification

Version 1.0

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Prepared for
COMP3059—Capstone Project I
Instructor: Anjana Shah
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Revision History

Date	Description	Author	Comments
November 12, 2020	Version 1	Onur Kazman, Baris Senturk, Elvin Hatamov, Ridvan Yilmaz, Dogukan Talas	First Revision of Software Requirements Specification

Document Approval

The following Software Requirements Specification has been accepted and approved by the following:

Signature	Printed Name	Title	Date
	Anjana Shah	Instructor, Comp3059	November 15, 2020

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1. Introduction

1.1 Purpose

The purpose of this document is to present a detailed description of the TurkTrade Stock Market Application. It will explain the purpose and features of the system, the interfaces of the system, what the system will do, the constraints under which it must operate and how the system will react to external stimuli. This document is intended for both the stakeholders and the developers of the system and will be proposed to instructor for its approval.

1.2 Scope

This software system will be a Virtual Stock Market Investment Platform for investors and people who want to become an investor. This system will be designed to maximize the investor’s experience by providing virtual tools and money to assist in investing in stock markets, which would otherwise have to be with real money. By maximizing the investor’s experience and minimizing the investor's risk the system will meet the investor’s needs while remaining easy to understand and use.

More specifically, this system is designed to allow an investor to invest in and follow the markets with a mobile application and a public website. The

software will provide market data and weekly, monthly reports to the investors, and the subscribes via the application and the website.

1.3 Definitions, Acronyms, and Abbreviations

Term	Definition
Investor	*A person that allocates capital with the expectation of a future financial return or to gain an advantage.*
Stock Market	*The aggregation of buyers and sellers of stocks.*
Database	*An organized collection of data, generally stored and accessed electronically from a computer system.*
Data	*Characteristics or information, usually numerical, that are collected through observation.*
Application	*A program or group of programs designed for end users.*
Virtual Investment	*A simulated trading process in which would-be investors can 'practice' investing without committing real money.*
Subscriber	*A person who receives a publication regularly by paying in advance.*
Website	*A set of related web pages located under a single domain name, typically produced by a single person or organization.*
Software Requirements Specification	*A document that completely describes all of the functions of a proposed system and the constraints under which it must operate. For example, this document.*
Stakeholder	*Any person with an interest in the project who is not a developer.*
User	*Reviewer or Investor.*

1.4 References

Software Requirements Analysis Template. (n.d.). Retrieved November 12, 2020, from www.cse.msu.edu/~chengb/RE-491/Papers/SRSExample-webapp.doc

The Needs Assessment. (n.d.). Retrieved November 12, 2020, from https://nces.ed.gov/pubs2005/tech_suite/part_2.asp

1.5 Overview

The next chapter, the General Description section of this document, gives an overview of the functionality of the product. It describes the informal requirements and is used to establish a context for the technical requirements specification in the next chapter.

The third chapter, the Specific Requirements section, of this document is written primarily for the developers and describes in technical terms the details of the functionality of the product.

Both sections of the document describe the same software product in its entirety but are intended for different audiences.

2. General Description

2.1 Product Perspective

This app will be developed for everyone who wants to invest money in the market stock. Users only need to register to log in to a game environment application. Users will be able to end their subscription and account by using stop subscription and delete account features. It will be developed to run on the android system and the web.

2.2 Product Functions

- User Profile
    - Graphical Representation of Stock (own/tracking)
    - Stock view improvement
    - Tracking list
    - Track list view improvement
- Mechanics
    - User can buy/sell shares of stocks from any company
    - User can track stocks they are interested in
    - Mechanics improvements
- Product Logo
- Game Cycle System

- Ranking System (of players total assets)
- System Controls
    - brokerage fees - commission for trades
    - users will be informed daily updated stock information

2.3 User Characteristics

Nowadays many people in the word trying to invest their money on stock market. But majority of them have not enough experience to invest their money correctly. This app will allow customers to get some experience and acknowledged about stock market. The daily updated email will provide users to control their investments.

2.4 General Constraints

There some general constraints are observed. They are below:

- Schedule
- Cost

2.5 Assumptions and Dependencies

The assumptions:

- Using machine learning
- The coding should be error free
- The system should be user-friendly so that it is easy to use for users
- User may access from any computer and android system.
- APIs must be used wisely. Changes in API are sudden and can impact the performance of your web app.

The Dependencies are:

- The specific software due to which product will be ready to run
- Admins have proper understanding of the product
- The system should have proper API working
- The information of all the users must be stored in a database
- Any updated is to be recorded to the database and the data entered should be correct

We have mentioned that we will use machine learning however none of us has enough machine learning experiences.

3. Specific Requirements

3.1 Functional Requirements

Log In

Introduction	User can access the interface
Inputs	User information
Processing	Verify if user information is valid
Outputs	Display a result if information is invalid; else, Display the main menu interface

Register

Introduction	User can create a new profile
Inputs	User information
Processing	Register user to the data
Outputs	Display the main menu interface

Display the Market

Introduction	User can display live stock prices
Inputs	-
Processing	Request necessary information from the api
Outputs	Display the market

Check Transfers

Introduction	User can display his/ her previous investments
Inputs	-
Processing	Request necessary information from the data
Outputs	Display user transfers

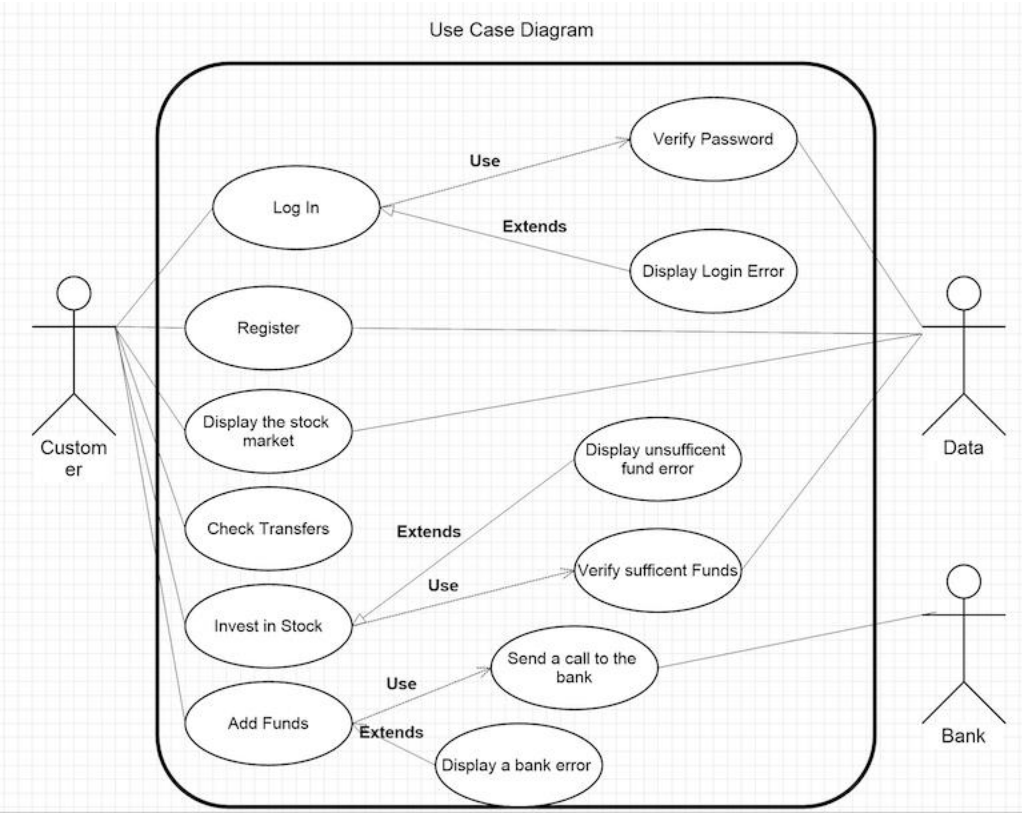
Invest

Introduction	User is able invest in stock
Inputs	Stocks that user is requesting to invest in
Processing	Verify if user has enough balance for that transaction
Outputs	Display if the transaction is successful; else, display a fund error message

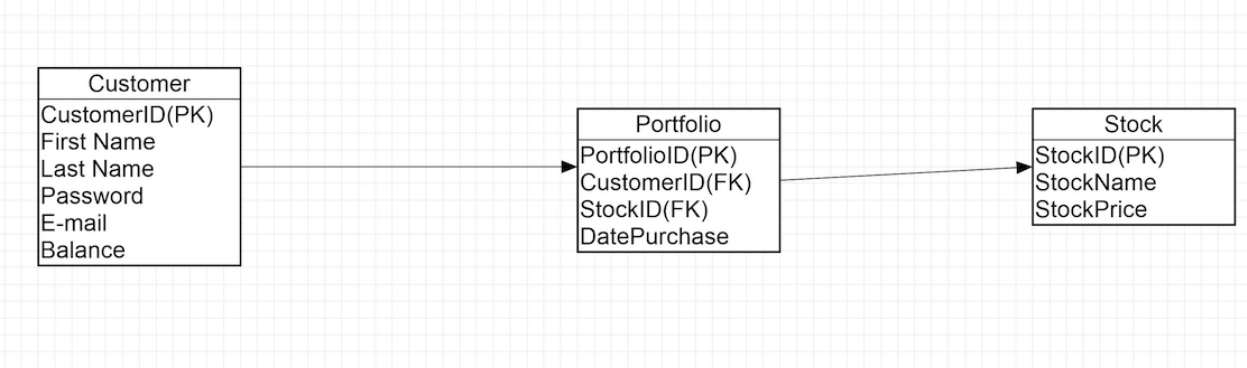
Add Funds

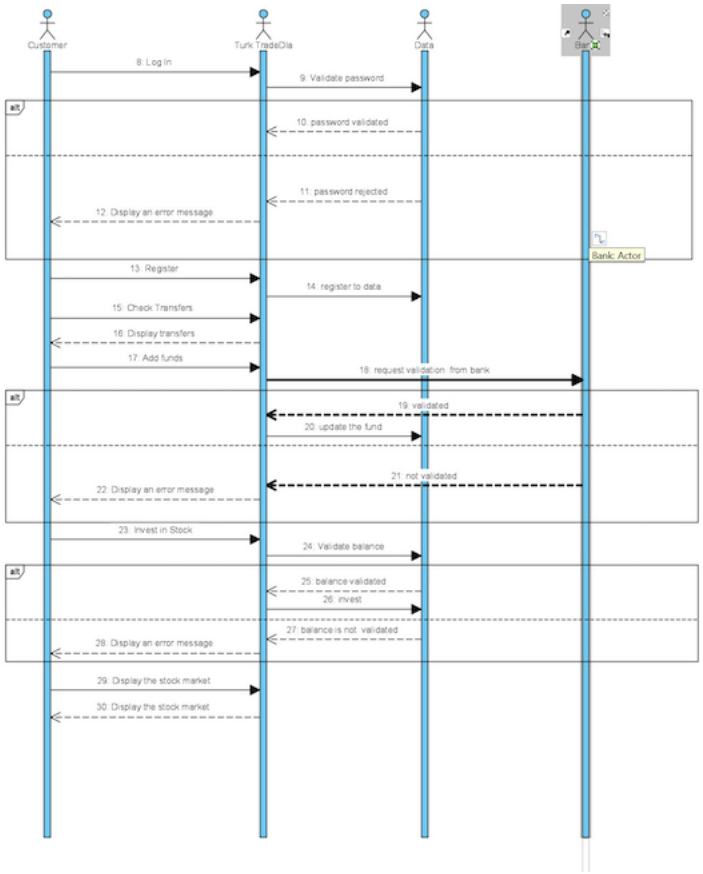
Introduction	User can add funds
Inputs	The amount user wants to add
Processing	Send a call to bank in order to verify the validity of user's bank account
Outputs	If funding is successful, display the new balance; else, display a bank error message

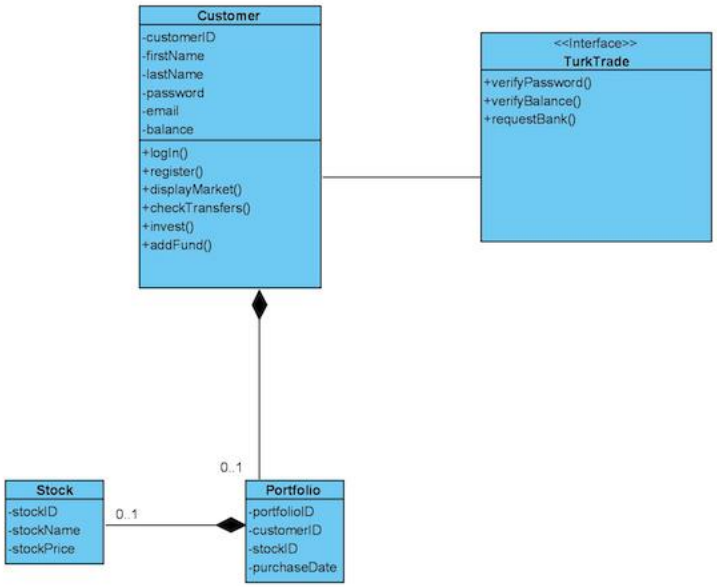
3.2 Use Cases



3.3 Data Modelling and Analysis


Customer
CustomerID(PK)
First Name
Last Name
Password
E-mail
Balance
Portfolio
PortfolioID(PK)
CustomerID(FK)
StockID(FK)
DatePurchase
Stock
StockID(PK)
StockName
StockPrice


Customer
Turk TradeDia
Data
Bank
8: Log In
9: Validate password
alt
10: password validated
11: password rejected
12: Display an error message
Bank: Actor
13: Register
14: register to data
15: Check Transfers
16: Display transfers
17: Add funds
18: request validation from bank
alt
19: validated
20: update the fund
21: not validated
22: Display an error message
23: Invest in Stock
24: Validate balance
alt
25: balance validated
26: invest
27: balance is not validated
28: Display an error message
29: Display the stock market
30: Display the stock market



3.4 Non-Functional Requirements

The stock managements system will be hosted in a ubuntu VPS server. The package of the VPS server would be 50GBs of storage and 2GBs of memory. Web designers will have access to VPS. We assume that Plesk panel would be used as server management software which provides free trial licenses every two week.

3.4.1 Performance

Server will be located at North America for faster processing times and page load times.

3.4.2 Reliability

We will choose a suitable VPS package for reliability. Our system will have sufficient memory, CPU, and storage to host our project and database.

3.4.3 Availability

Server will be up 7/24 and reachable from anywhere of the world.

3.4.4 Security

Only port numbers of 80,443 will kept open to ensure security. Security exemption will be made for web designers in the firewall. Web designers will have access to SSH, FTP and server management software interface. SSL will be used for website to prevent third persons from reaching form transfers.

3.4.5 Maintainability

Cloudflare CDN services will be used to prevent unwanted traffic and cache data. Our origin server's IP will be proxied and will not be exposed to public. In case of a disruption at our origin server, Cloudflare will show users to cached data of our website instead of an error.

3.4.6 Portability

Our product will run on both web and mobile app. Both mobile application and website will use MySQL database located at server. SQL language will help to reach to database from mobile app and web. Some APIs may be created for data exchange between web application and mobile application.

3.5 Inverse Requirements

Usernames will consist of e-mail addresses therefore providing e-mail address will be mandatory. Password of the users will be between 6 and 30 characters long and cannot include quotes to prevent SQL injection.

3.6 Design Constraints

As a design, we only will be able to use CSS, html as our team do not have sufficient information about how to create PSD files and use them. The design for the android application will be made in android studio. We may use templates from the internet.

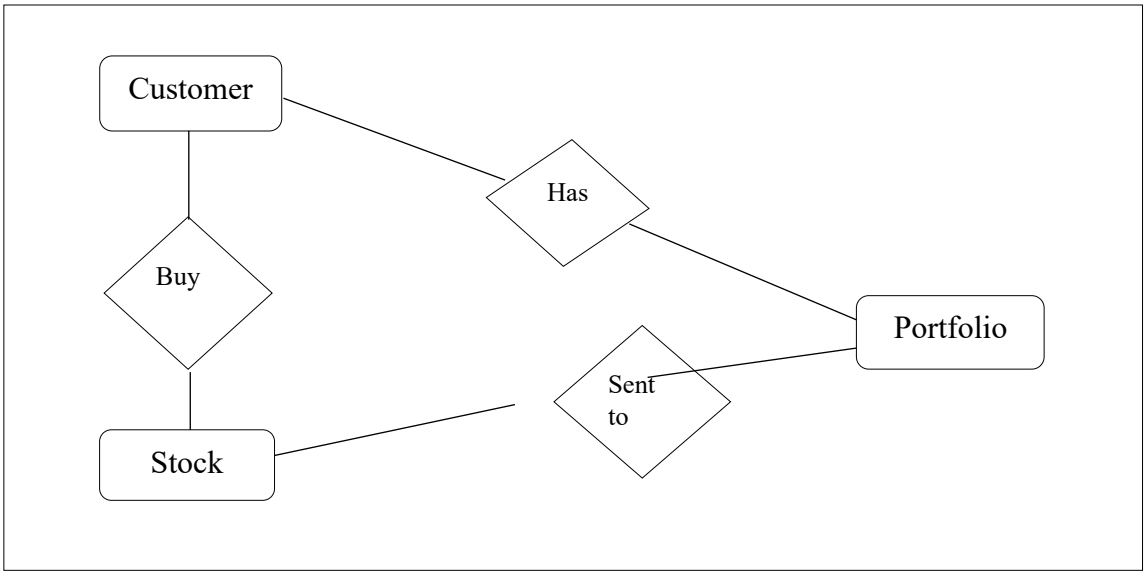
3.7 Logical Database Requirements

System will store all user data including their username, password, name, e-mail, phone number and balance information in Canadian Dollars. Users' information will be stored in a table named user. Also, there will be table named portfolio. Table will consist of users' asset records such as current possession of stocks. The portfolio table will have stock number, user's unique id, quantity of stock and date purchased columns. A MySQL database will be used for the project. Foreign keys at the child table will be created to make relationships between tables. All columns with relationships to other tables will be indexed. Storage of the database will be dependent to storage of server because database will use server's storage. All tables will have a unique id column with auto increment rule, and they will be primary keys.

3.8 Other Requirements

- Bootstrap templates
- Domain for the website
- SSL certificate for the website
- Database connection module for mobile app

4.0 Logical Database Requirements



Customer Data Entity

Data Item	Type	Description	Comment
CustomerID	INT	Primary key of Customer	
Password	VARCHAR	Characters for authenticating	
Email	VARCHAR	Internet address	
FirstName	VARCHAR	First name of Customer	
LastName	VARCHAR	Last name of Customer	
Balance	INT	The amount of customer's money	

Portfolio Data Entity

Data Item	Type	Description	Comment
PortfolioID	INT	Portfolio's primary key	
CustomerID	INT	Customer foreign key	Determination of which the portfolio belongs to customer with CustomerID
StockID	INT	Stock foreign key	Determination of which stocks are in Portfolio with StockID
DatePurchase	DATE	Date of stock purchase	

Stocks Data Entity

Data Item	Type	Description	Comment
StockID	Int	ID number of Stock	
StockName	VARCHAR	Name of Stock	
StockPrice	Int	Price of Stock	

5.0 Approval

The signatures below indicate their approval of the contents of this document.

Project Role	Name	Signature	Date
Software Developer	Onur Kazman		November 15, 2020
Web Developer	Baris Senturk		November 15, 2020
Project Manager	Elvin Hatemov		November 15, 2020
Web Developer	Ridvan Yilmaz		November 15, 2020
Software Developer	Dogukan Talas		November 15, 2020