

Pineapple

Architecture and Design
Document

Table of Contents

[1 Introduction](#)

[1.1 Purpose](#)

[1.2 Scope](#)

[1.3 Definitions, Acronyms and Abbreviations](#)

[2 Architectural Representation](#)

[3 Architectural Goals and Constraints](#)

[4 Use-Case View](#)

[5.1 Logical View](#)

[5.1 Architecture Overview](#)

[5.1.1 Frontend](#)

[5.1.1.1 jQuery](#)

[5.1.1.2 Bootstrap](#)

[5.1.2 Controller](#)

[5.1.3 Model](#)

[5.1.4 Database](#)

[5.1.5 Middleware](#)

[5.1.6 Global Artisan Commands](#)

[5.1.7 Global Laravel Framework](#)

[5.1.8 Global Helpers](#)

[6 Module Interconnection Architecture View](#)

[6.1 Model](#)

[6.1.1 Model Class Diagram](#)

[6.1.2 Database ER Diagram](#)

[6.2 Controllers](#)

[6.2.1 Show Stock Controller](#)

[6.2.2 Transaction Controller](#)

[6.3 Views](#)

[6.3.1 Stock View](#)

[6.3.2 Trade Account View](#)

[7 Deployment View](#)

[7.1.1 Desktop/Mobile Browser](#)

[7.1.2 Pineapple Server](#)

[7.1.3 Fixer.io API](#)

[7.1.4 Stock Market Company Listing](#)

[7.1.5 Yahoo! Finance and Yahoo! Finance Chart API](#)

[8 Activity Flow](#)

[8.1 User Activity Diagram](#)

[8.2 Administrator Activity Diagram](#)

[8.3 Forgotten Password Activity Diagram](#)

[Appendix](#)

[References](#)

1 Introduction

1.1 Purpose

This document provides a comprehensive architectural overview of the system, using a number of different architectural views to depict different aspects of the system. It is intended to capture and convey the significant architectural decisions which have been made on the system.

1.2 Scope

This Software Architecture Document provides an architectural overview of the Pineapple Stock Buddying Game. Pineapple is being developed by SticksAndStocks to help buddying stock market traders get a feel for the risks and rewards of stock market trading, without the use of real money.

This Document has been made directly from the Pineapple implementation that uses Laravel PHP Framework and the MySQL database.

1.3 Definitions, Acronyms and Abbreviations

Pineapple makes use of various definition, acronyms and abbreviations as follows:

- Pineapple System: A high level term used to describe the Pineapple Stock Buddying Game.
- Guest: An unregistered visitor of the Pineapple System.
- User: A registered and authenticated visitor of the Pineapple System
- Admin: A registered User that has elevated privileges inside the Pineapple System.
- Client: A term for any visitor (guest/user/admin) of the system.
- ORM: Object Relational Mapping, an abstraction of the database tables and relations into Classes that can be used by the Laravel system.

2 Architectural Representation

This document presents the architecture as a series of views; use case view, logical view, process view and deployment view. There is no separate implementation view described in this document. These are views on an underlying Unified Modeling Language (UML) model.

3 Architectural Goals and Constraints

There are some key requirements and system constraints that have a significant impact on the way that the Pineapple System was designed and implemented. These include:

- Using a common, open source, and easy to maintain framework to build the system off. Using Laravel that uses the PHP scripting language and a Model, View, Controller architecture, and using the MySQL Relational Database System, means that the system is able to be easily deployed and maintained.
- Users should be able to view the Pineapple System on any device that has a web browser. This also meant that on different device sizes the Pineapple System had to look and show the requested information properly.
- The added requirement to allow the searching, viewing, buying and selling of other stock markets meant that we had to have a very elastic system that could be easily manipulated to incorporate these changes. The use of Yahoo! Finance meant that we had such flexibility.
- Cost of development was also a major factor. We had specified that we wanted a server for the customer to view progress and provide immediate feedback if necessary. Being a PHP and MySQL framework meant that we could deploy a Linux server to host the development system that would reflect the real life implementation.

4 Use-Case View

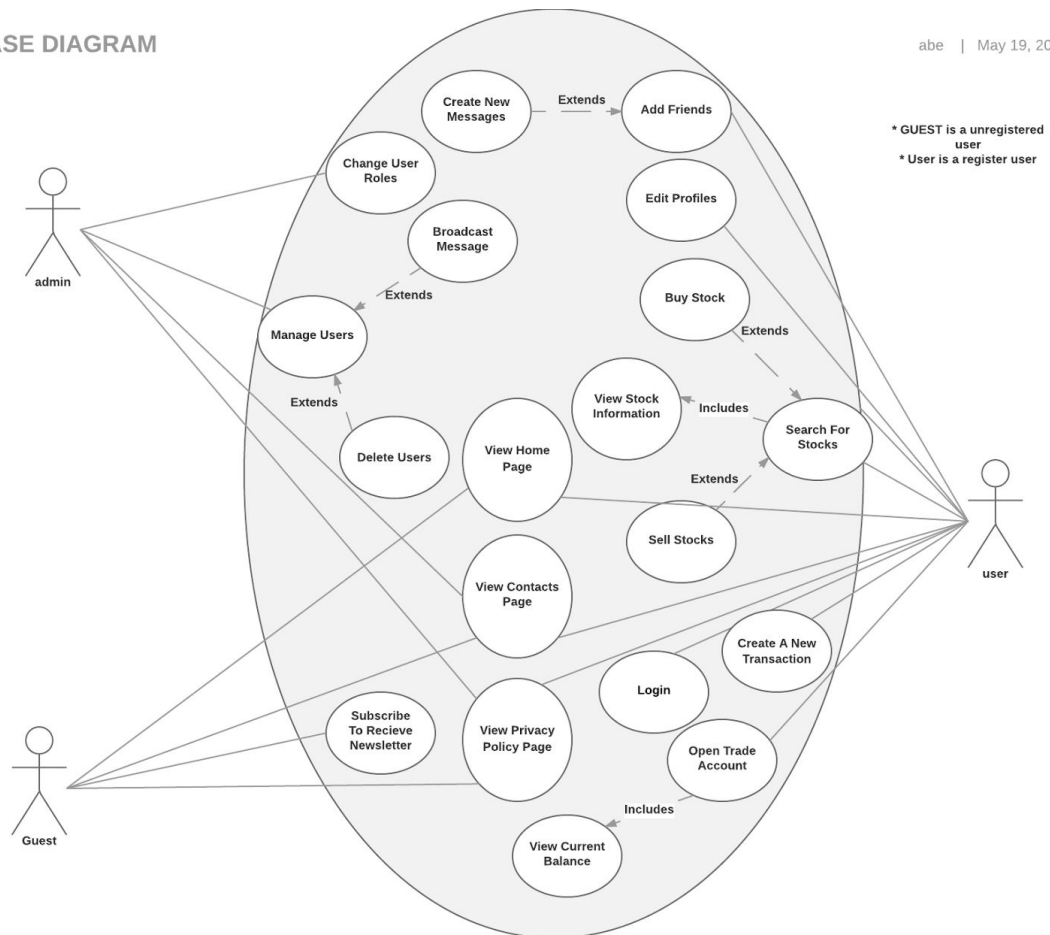
The Use Case Diagram demonstrates how different actors interacts with in the application in order to accomplish a goal.

Precondition:

- The administrator is registered actor and has elevated privileges
- User has to register in order to login and use the application
- Guest is a unregistered user that can view index page

USE CASE DIAGRAM

abe | May 19, 2017



5.1 Logical View

A description of the logical view of the architecture. Describes the most important classes, their organization in service packages and subsystems, and the organization of these subsystems into layers. Also describes the most important use-case realizations, for example, the dynamic aspects of the architecture. Class diagrams may be included to illustrate the relationships between architecturally significant classes, subsystems, packages and layers.

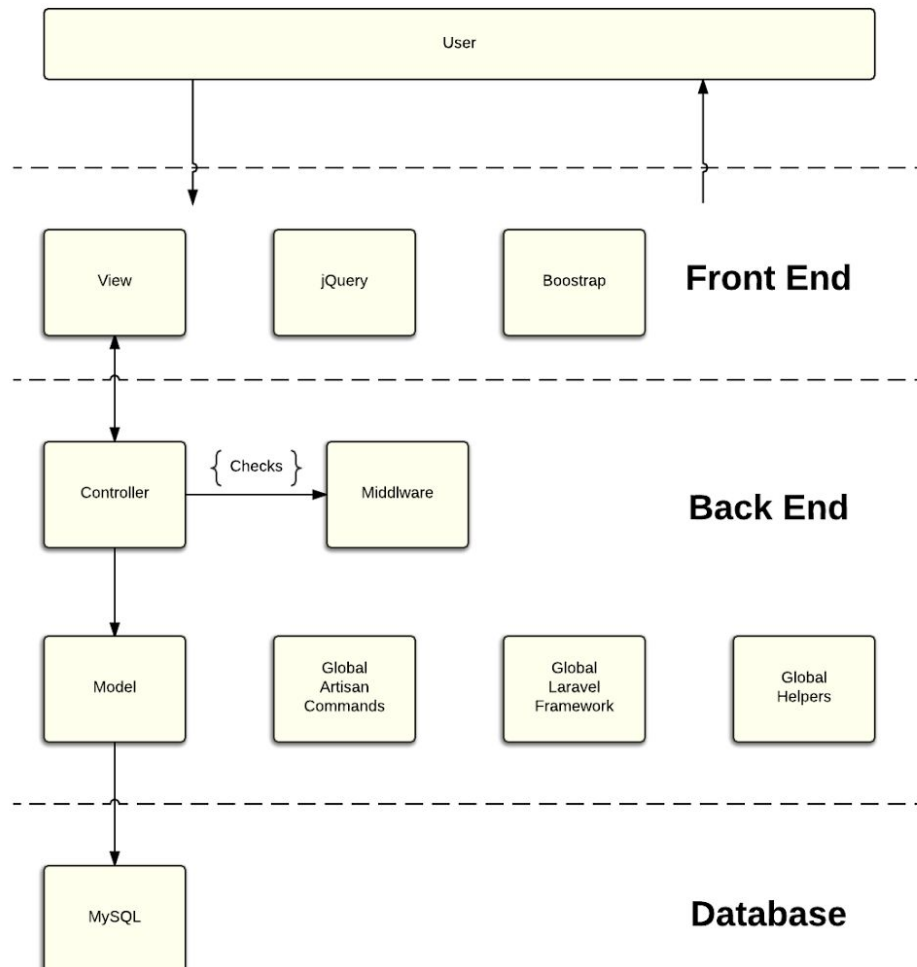
The logical view of the Pineapple Game is comprised of 3 main packages: Model, View, Controller. There is also 4 sub main packages that help control system management, including Global Reusable functions and classes: Artisan Commands, Laravel Framework, Custom Middleware and Custom Helpers.

The Model Package contains classes for interfacing to the database through ORM and providing convenience functionality for Controllers and Views to get data dynamically. This package is also responsible for providing an abstraction layer to model the external data collected from external APIs.

The View Package contains classes and a rendering engine (called Blade) that pre-renders Model data into HTML DOM and/or Javascript objects. This provides a very easy and convenient way to organise data representation to the Guest/User/Admin of the client device.

The Controller Package contains classes that act as a intermediary between the Model and the View packages. This package controls the client's interaction to the model, through manipulation and validation the Controller package makes sure that the View that the client interfaces to cannot directly manipulate data on the Model. The Controller Package also manipulates data from the Model through to the view, providing a business logic layer.

5.1 Architecture Overview



5.1.1 Frontend

Layer

Represents the HTML/CSS/Javascript to be rendered on the client's browser. Provides a pre-rendering engine to interface to Model components.

5.1.1.1 jQuery

Library

A Javascript library that runs inside the view. Provides convenience functionality for common tasks such as AJAX API calls, autocomplete and other dynamic features.

5.1.1.2 Bootstrap

Library

CSS/Javascript library to help make styling easier, and is driven by a mobile first approach, meaning that it is designed with responsive functionality inbuilt.

5.1.2 Controller

Layer

Represents client actions, responses and data transfer between the Model and View layers.

5.1.3 Model

Layer

An ORM representation of the Database, with validation of passed data. Provides abstract functionality to insert/update/read/delete objects in database.

5.1.4 Database

Layer

Represents the database implementation.

5.1.5 Middleware

Layer

The wrapping layer used by the Controller to restrict access to certain functionality of the Pineapple System.

5.1.6 Global Artisan Commands

Layer

Laravel provided abstraction of server functionality. Provides ways to add custom commands for use system wide at a command line level.

5.1.7 Global Laravel Framework

Layer

Overriding framework that the Pineapple System organisation.

5.1.8 Global Helpers

Global Functions and Classes

Represents the functions and classes that are used system wide, but do not require the use of low level system calls provided by the Artisan Commands.

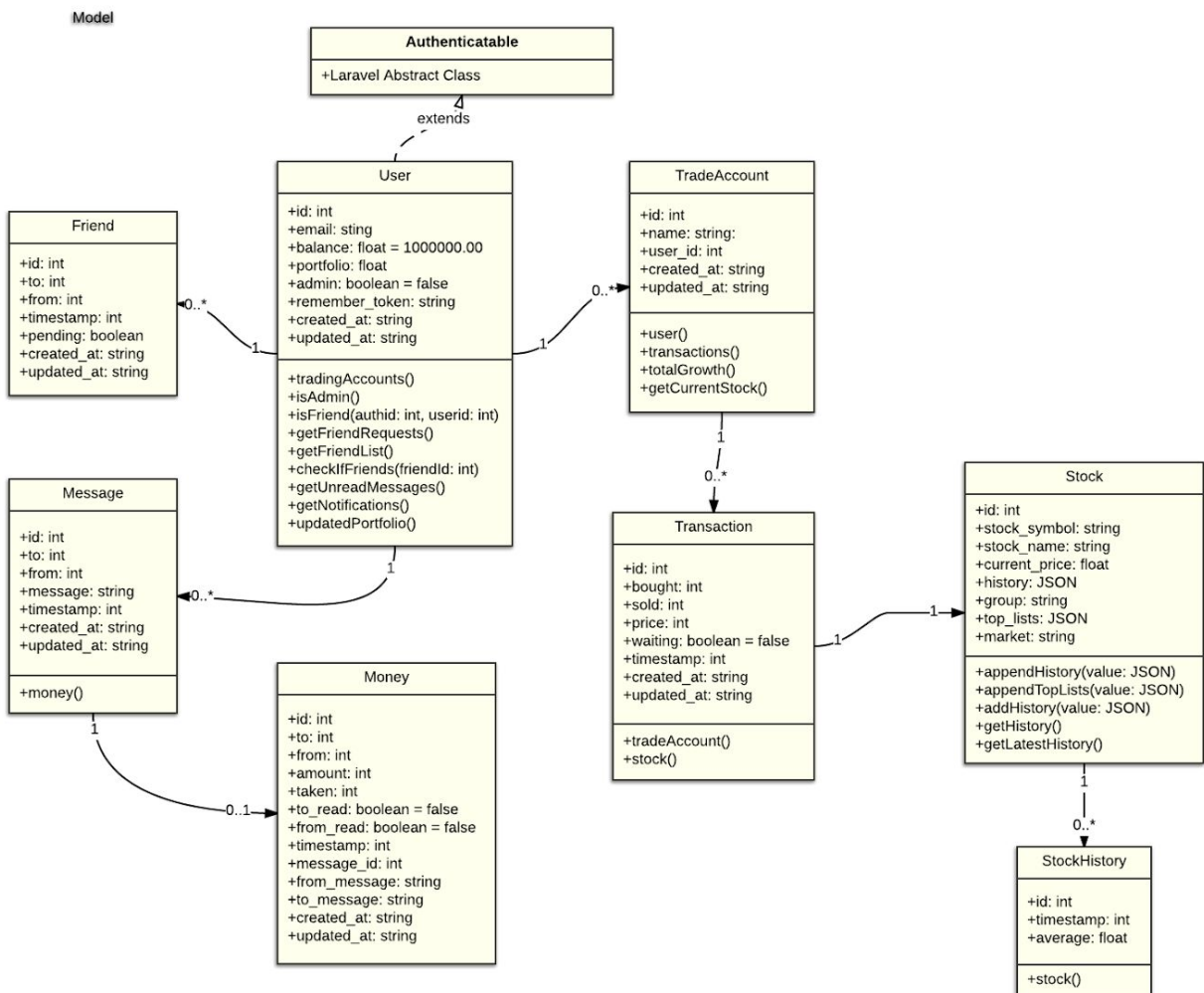
6 Module Interconnection Architecture View

A description of relationships using Class Diagrams of the three major elements (Model, View and Controller), and the major sub components (Middleware, Artisan Commands and Global Helpers).

6.1 Model

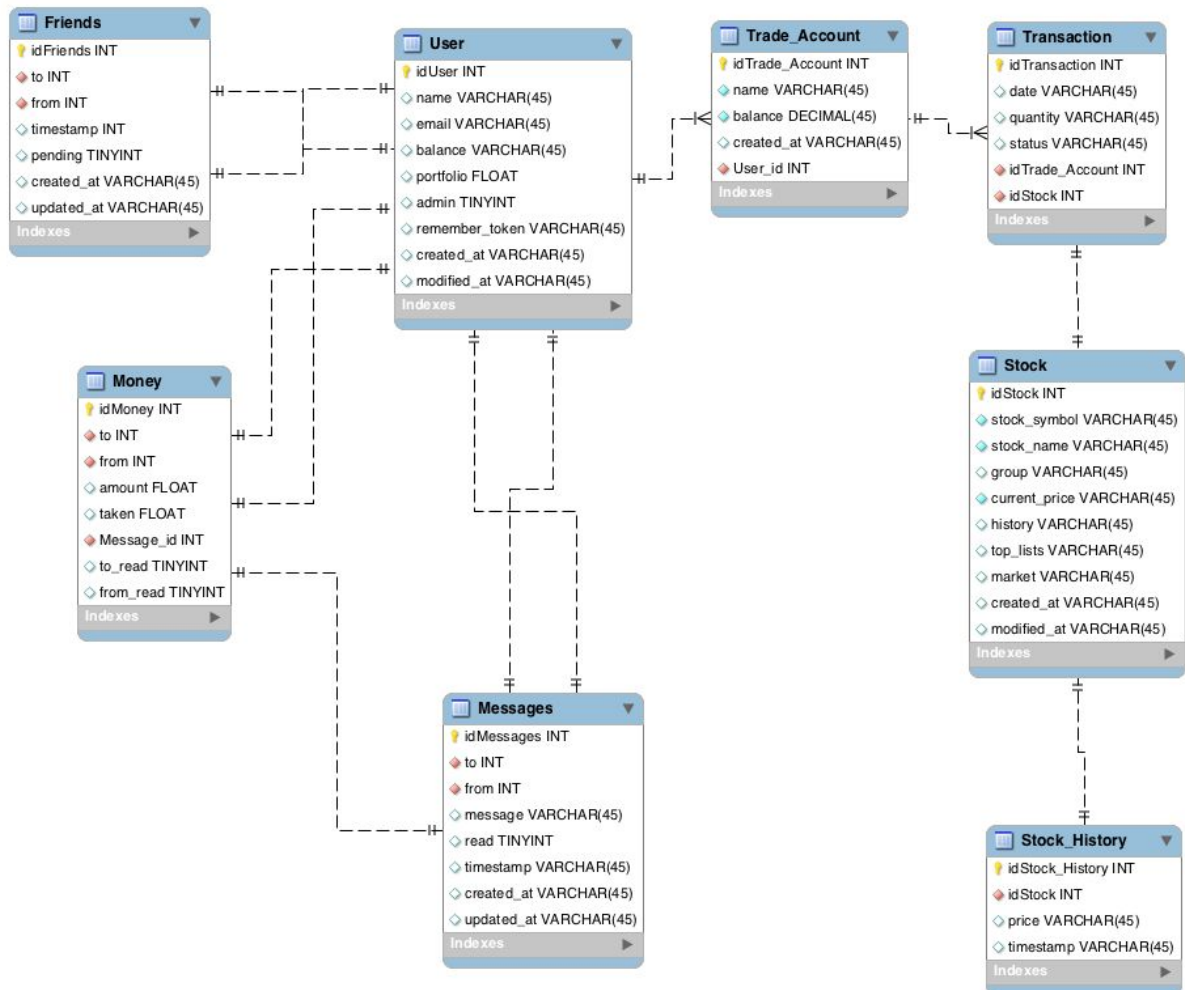
6.1.1 Model Class Diagram

Show the layout of the Model that maps through an ORM to the database. Model controls the constraints and validation of the data relating to the database. The Model also provides functions and methods to Controllers and Views to easily and clearly retrieve and model data from the database.



6.1.2 Database ER Diagram

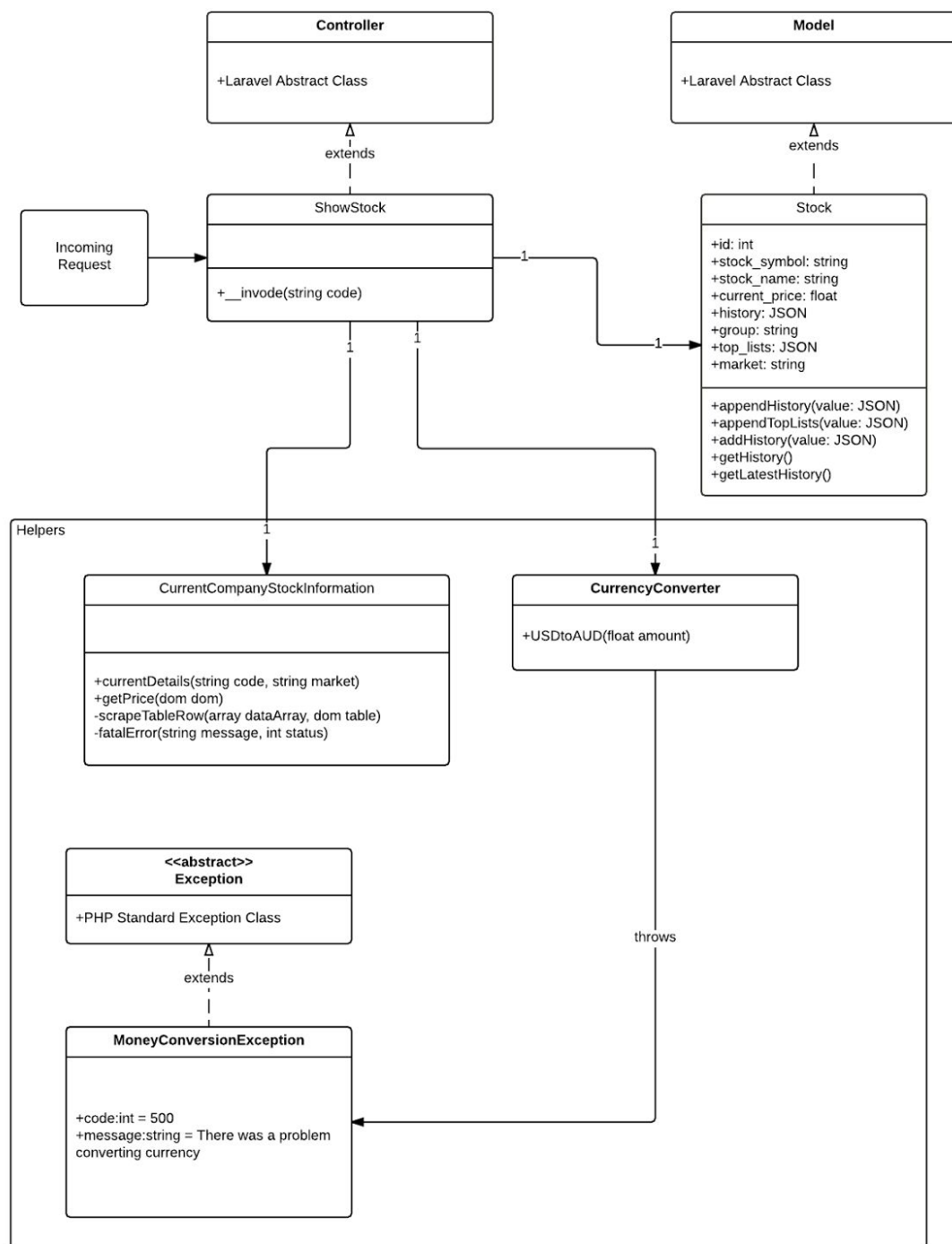
Shows the layout of the database and the relationships between tables. This maps one-to-one with the Model diagram, thus completing the ORM.



6.2 Controllers

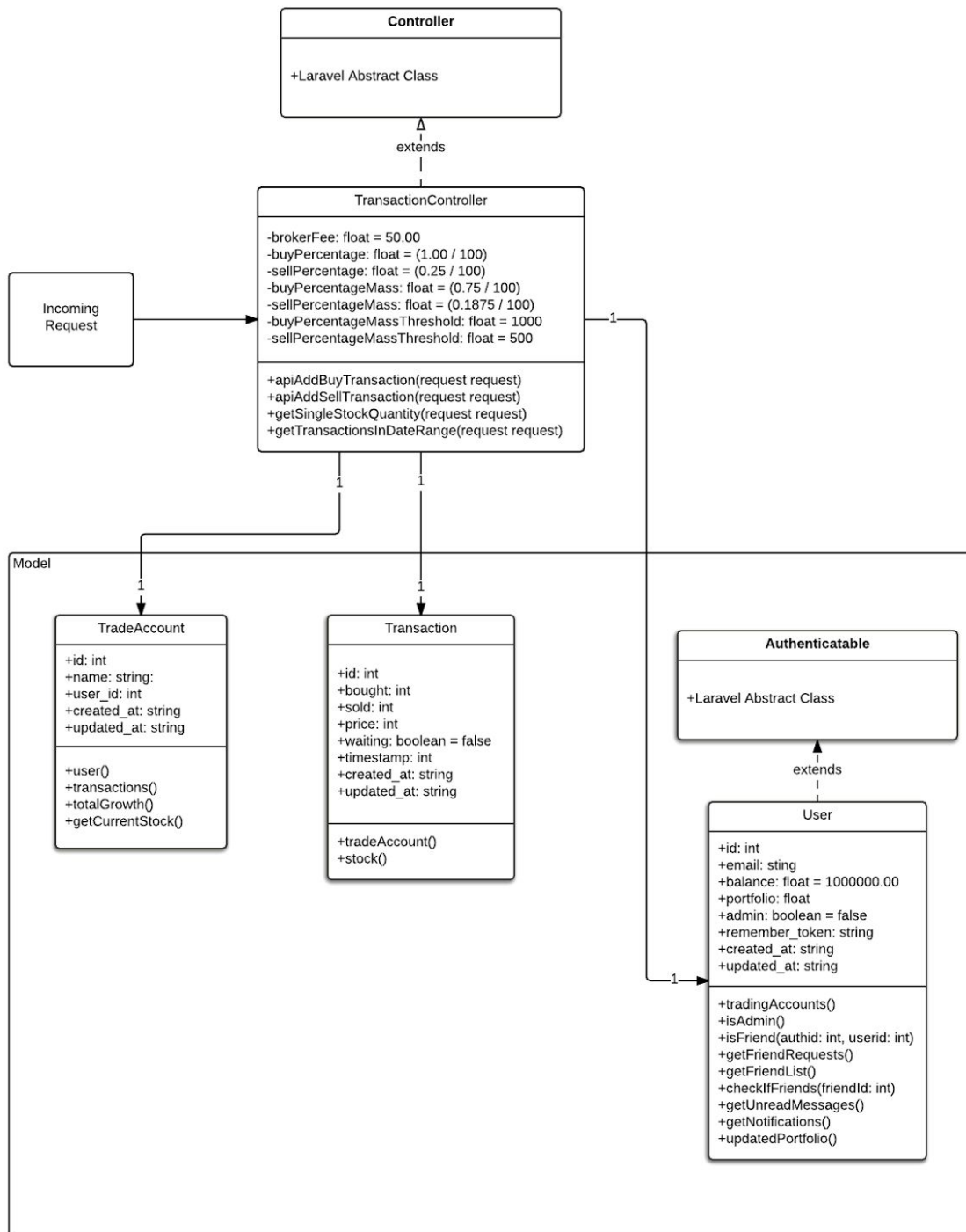
6.2.1 Show Stock Controller

Shows the interaction between classes when an incoming request asks for information on a Stock Company. This only shows the internal workings of getting Stock, not the API calls as they are contained within the functions of the classes shown.



6.2.2 Transaction Controller

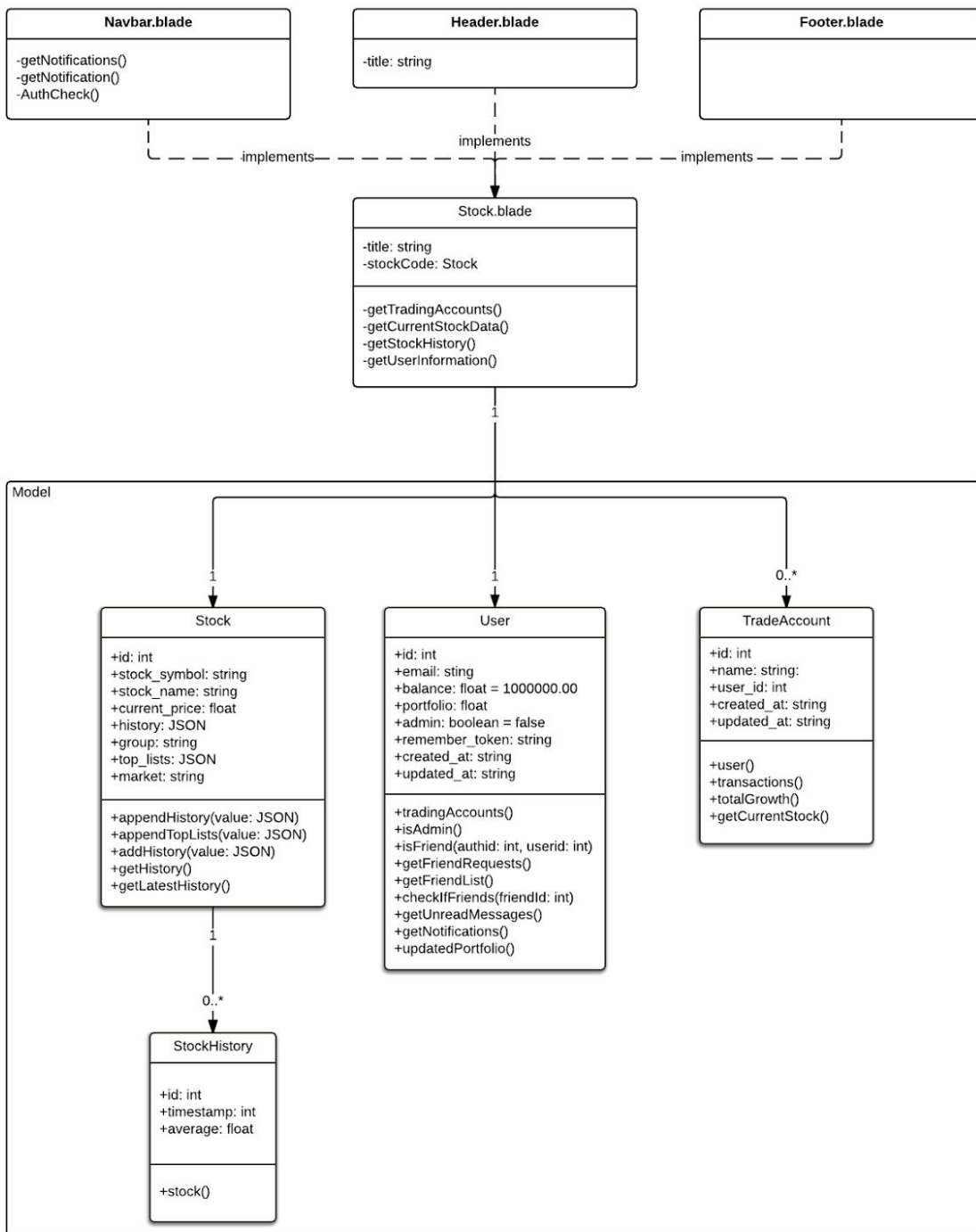
Show the class interaction when buying and selling shares, how it interacts with the Model to update User and Trade Account information. The Transaction controller mediates the data manipulation and model abstraction, with data and user validity checking. The class diagram for both buying and selling are identical, as such they also share common functionality and implementation to help with maintainability.



6.3 Views

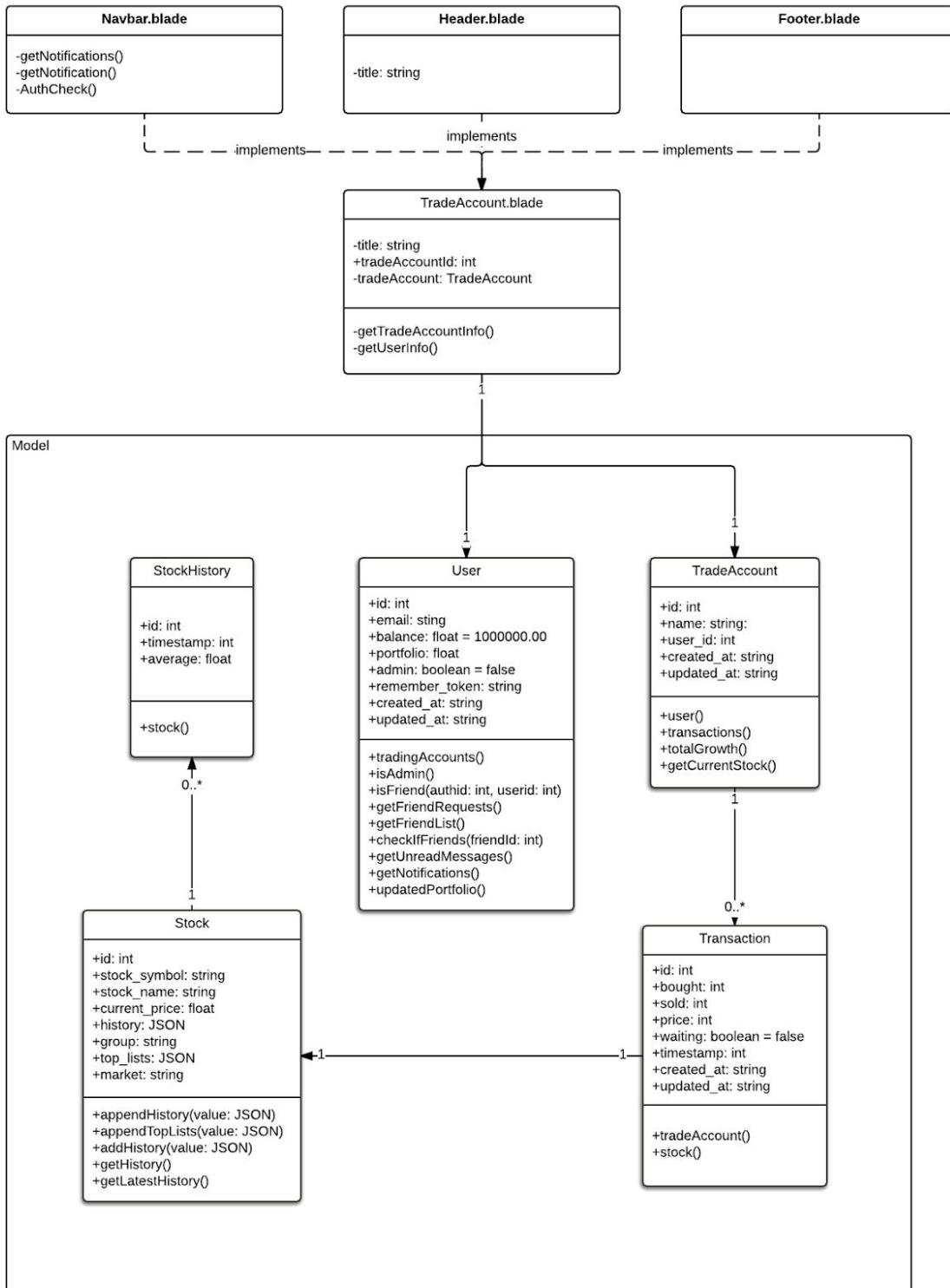
6.3.1 Stock View

Describes the class interaction between the Stock.blade class, the included files and the calls to the Model. This does not cover API or AJAX calls directly, however it does include the collection of all information that is required to perform all of these tasks.



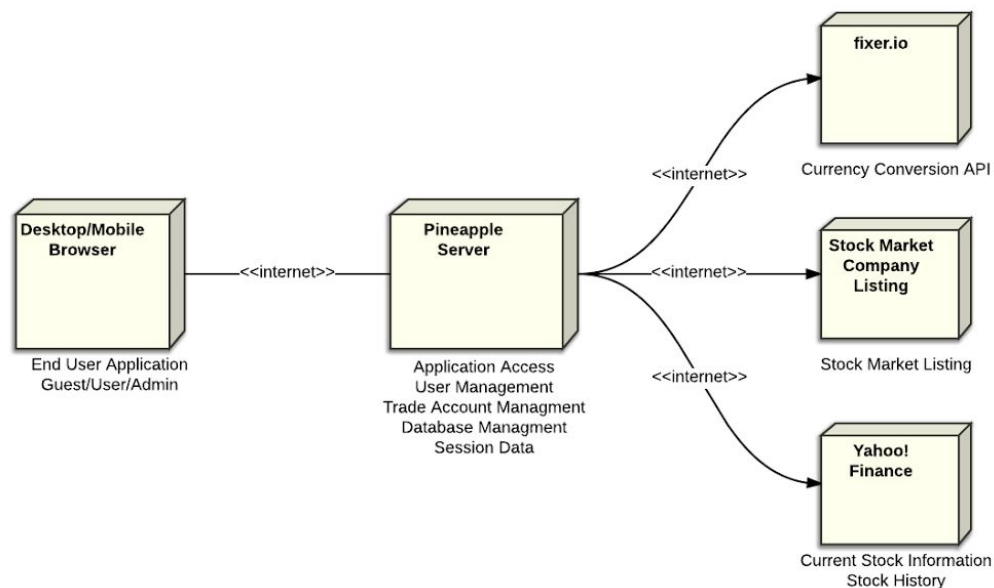
6.3.2 Trade Account View

Describes the class interaction between the trade-account.blade class, the included files and the Model. Shows retrieval of information passed from Controller to the View, then how the View can call the Model to get the information to display.



7 Deployment View

A high level view of the deployment architecture of the Pineapple System. Describes the various physical nodes for the platform integration configurations. The idea is to get an overview of how the Client, Pineapple Server and remote APIs come together over internet connections to present and process data requested by the client.



7.1.1 Desktop/Mobile Browser

Guests can register as Users who interact with the server create Trade Accounts to buy, sell and view Stock information. Users can also use the social media features such as Add/Remove Friends, message Friends and send/receive money from Friends.

7.1.2 Pineapple Server

The Pineapple Server is the server that orchestrates the interaction between Clients and associated APIs and Database functionality. All Clients have varying degrees of access to different features of the server depending on privileges assigned. Also retrieves and manipulates data from external API providers.

7.1.3 Fixer.io API

A third party REST API that returns any common current currency conversion rates in JSON format. Access is controlled by Pineapple Server.

7.1.4 Stock Market Company Listing

A collection of third party CSV files that contain a list of all the currently listed Stock Exchange companies for ASX, NASDAQ, NYSE and AMEX. CSV files are extracted, sorted and inserted into the database for use by Clients.

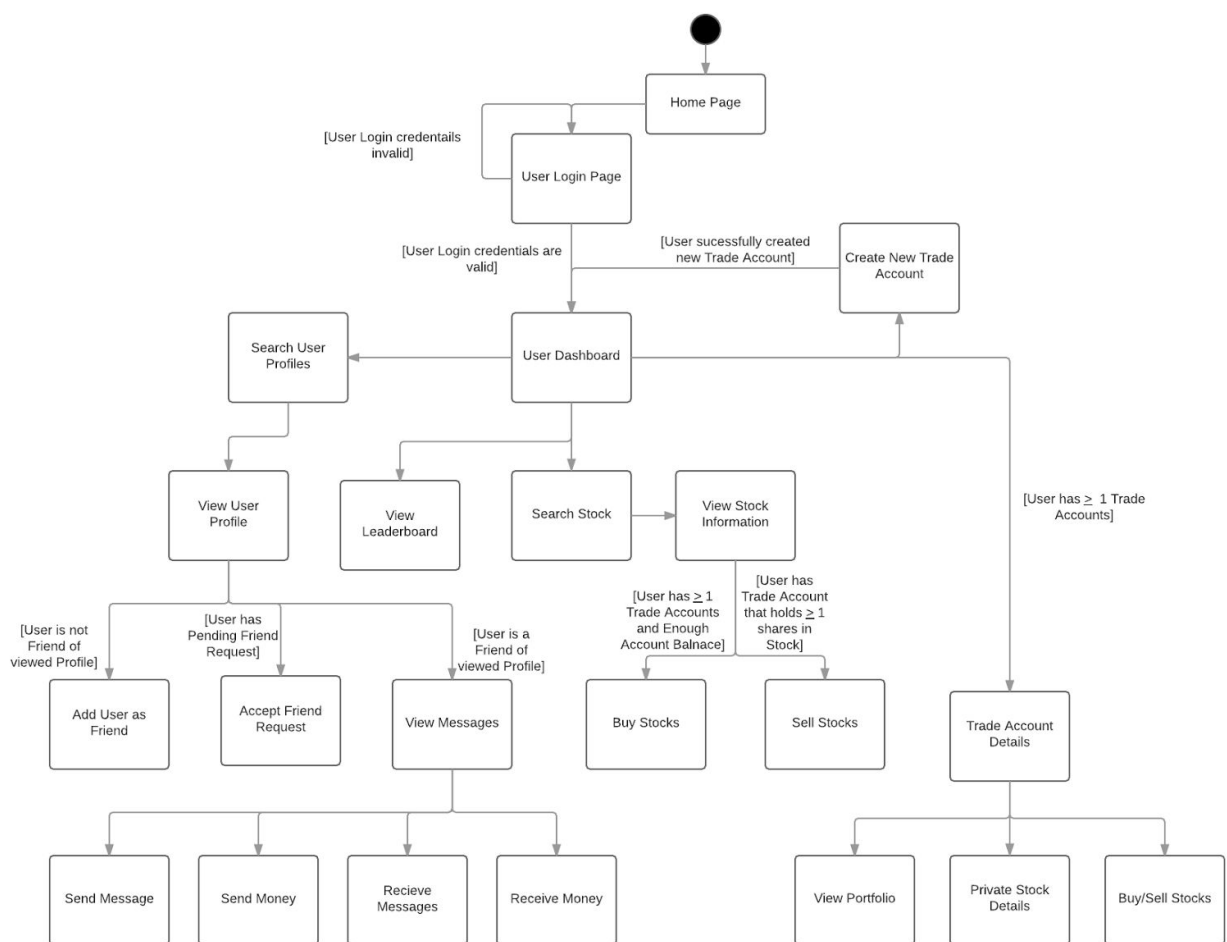
7.1.5 Yahoo! Finance and Yahoo! Finance Chart API

Yahoo! Finance provides extensive and up to date data on Stock Companies worldwide. It is where the Pineapple System gets all of its latest Stock data from. Yahoo! Finance Chart API provides a REST API to get bulk histories of Stock Companies in CSV format, that is then gathered and collated by the Pineapple Server.

8 Activity Flow

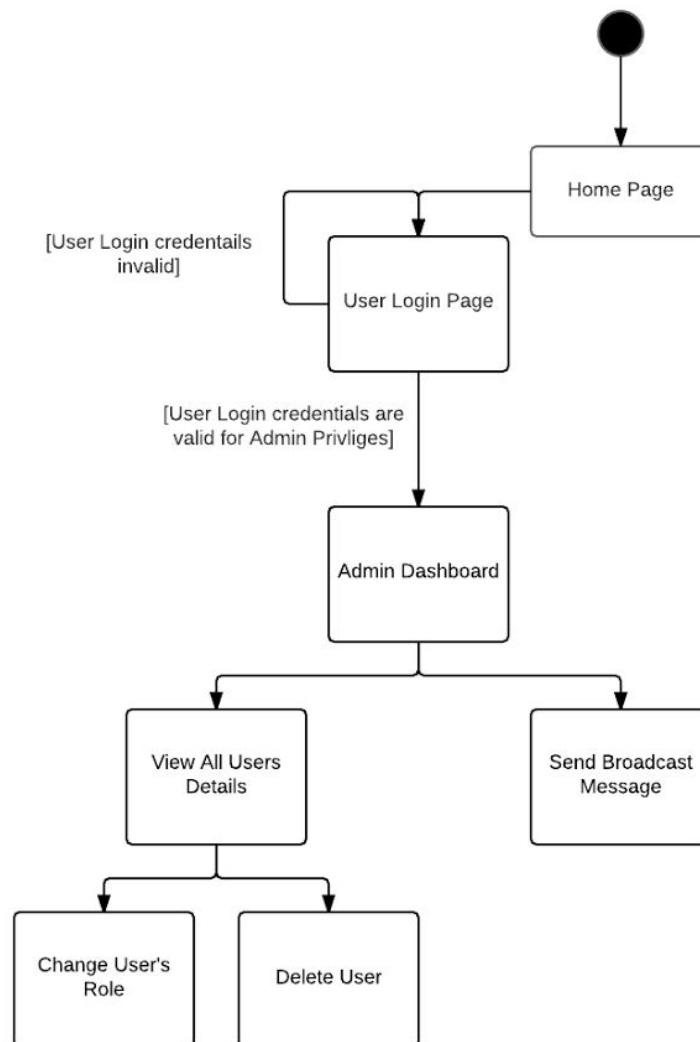
8.1 User Activity Diagram

Describes the User interaction with the Pineapple System. Shows what a User can do, view and manipulate within their defined privileges. This includes the sign in process, the purchase and selling of Stocks, viewing other user profiles and more.



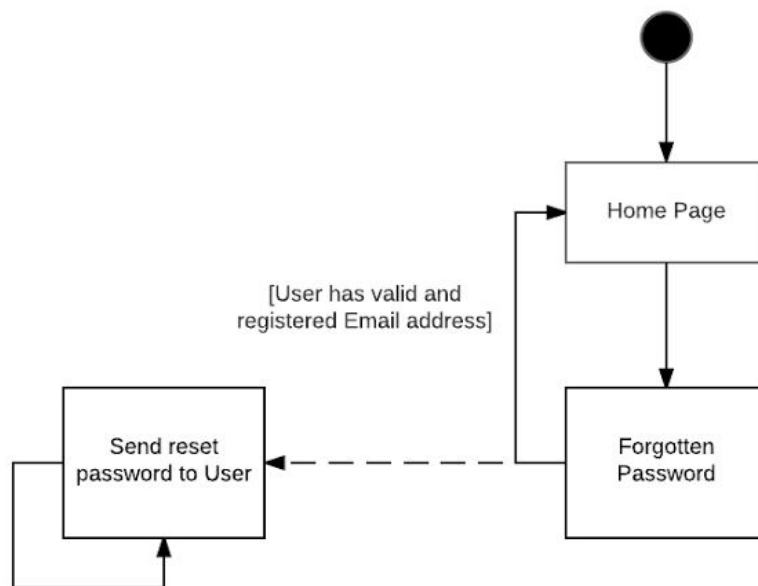
8.2 Administrator Activity Diagram

Describes the Administrator interaction with the Pineapple System. Show the flow of modifying a User's role, deleting a User and sending a broadcast message to all registered Users in the Pineapple System.



8.3 Forgotten Password Activity Diagram

Describes the interaction a Guest who is registered with the system but has forgotten their password to log into the system. Shows the flow of forgetting their password and recovering login information.



Appendix

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