

Project Proposal



Team

Computer Science Project COMP3900/9900

Scrum Master

/ Developer

Developer

Developer

Developer

Background

A stock exchange is an *“organized and regulated financial market where securities (bonds, ¹ notes, shares) are bought and sold at prices governed by the forces of demand and supply”*.

It dates back to the early 1600s where the Dutch East India Company became the first organisation to issue shares of stock and bonds to the general public. Since then the popularity and size of stock exchanges has grown significantly.

The stock exchange is constantly evolving and much has changed since its origins, especially in recent years with the emergence of cryptocurrencies. The price of crypto tokens is set just like in stock exchange, by supply and demand. As of 2017, over a thousand cryptocurrency coins exist and are turning the financial services space upside-down because of their growing influence in changing marketplace dynamics.

Some believe that cryptocurrencies are the way of the future, and invest in them due to their strong belief in its future value for society, while others invest for the opportunity to make quick short-term profits. Looking at the statistics in recent years, cryptocurrencies have proven to be a very good investment for those who got in early - in 2017 alone, there was an increase in value of 1,500% in Bitcoin and over 10,000% in Ethereum. More and more new “Cryptos” are emerging that offer even higher possible returns. With such a high potential, it's no surprise Cryptocurrencies attract both finance/investment professionals and general public.

It is because of the popularity and demand of Cryptos that our team aims to implement a Cryptocurrency Portfolio Management app (), rather than the stock-oriented option. With all the possible crypto coins on the market, buying multiple currencies to diversify your portfolio and manage risk is very common, hence managing and tracking your coins becomes an issue. A Cryptocurrency Portfolio Management application is built specially to overcome this obstacle by enabling the user to add and delete owned coins to a single portfolio.

Aim

Our team's collective vision and overarching goal is to create a minimalistic, user friendly and effective portfolio application for tracking cryptocurrencies, while providing a high level of utility we also aim to uphold strong standards of usability and aesthetics.

Many crypto portfolio applications currently exist on the Google Play Store. Several offer effective and usable interfaces achieving narrowly targeted goals while leaving additional features lacking in utility. will address three of these prominent issues:

¹ <http://www.businessdictionary.com/definition/stock-exchange.html>

1. Community discussion
 - News and discussion will be outsourced from active user generated and moderated forums. This will assist with the rising issue of 'fake news' in today's media.
2. Identifying early interest
 - Finding a coin, ICO or token early in its life cycle is extremely important. will be able to identify times of high interest through the user activity changes observed in the individual coin's news section. This is made possible through the implementation of the highly popular user generated discussion board.
3. Comparing net price and identifying arbitrage
 - With hundreds of exchanges offering a wide range of coin prices, bid/ask spreads, percentage commission and transfer fees, it can be extremely difficult to know the best exchange to purchase and transfer out a specific coin. As such, will display a sorted list of the net total cost of purchase from several popular exchanges.

Design / flow (Standards / Google's Material Design)

Apps are more than just code. Animations, menus, styles, colours and the user interface in general is an integral part of a mobile application. When a user launches the app the first thing they notice is the UI, therefore making the app appealing to the viewer a key objective. When an app doesn't look great, this leads to a poorer overall experience. Hence a lot of focus has to be placed into the design process of every activity, button, bar or image.

Closely linked to the concept of design is flow, which means that a user always has the most important features of the app at their fingertips. Together, careful design and flow is essential and leads to the overall success of the application.

Because of their importance, our team is going to put every effort to deliver an eye-catching and user-friendly design. To achieve this we will closely follow Google's material design guidelines¹ which highlight the pros and cons of every design decision, as well as providing up-to-date, general design standards used by app developers. Following an existing set of design guidelines that are widely used across the Android app ecosystem also makes our user interface intuitively easy to use.

Scope / Technical Details

Deciding what is in and out of the project's scope is an important step in the design of any application. Of particular relevance for our app are considerations of what Android version we will use and the number of cryptocurrencies that a user can choose from.

¹ <https://developer.android.com/design/index.html>

We have decided to support Android devices running version 5.0.x+, accounting for around 82.4% of Android devices worldwide (as of Feb 2018).² We've also decided to limit our list of currencies to the top 100 coins provided by the CoinMarketCap API, covering the most popular currencies such as; Bitcoin, Ethereum, Ripple and Litecoin.

As we will be sourcing real-time data about the value of cryptocurrencies, we will need to make use of one or more APIs. This limits our scope to the data that a free API can provide, and its accuracy and frequency at which the data is updated. It also will be a major factor in the way we decide to structure our application, as free APIs usually have a rate limit (e.g. www.coinapi.io/ limit its users to 100 requests a day, and <https://coinmarketcap.com/api/> limits its users to 10 requests per minute). We will make use of Android's support for SQLite databases and store our data in tables, which allows us to minimise the number of API calls that we need to make, as well as letting us provide the stored data to a user who has slow or no internet connection.

Team Skill Set

Languages: Python, Java, C, C++, Ruby, XML

Strengths: Design, communication, organisation, teamwork, project management

Experience: Android app development, User interface design, software engineering

Project Choice

Our choice of project was heavily based on our team member's strengths and weaknesses. With the majority of our members leaning towards higher level design, we decided against the more technical, decentralised project. The portfolio management project interested , and myself more so than the legal case search engine, while was indifferent. We decided to adapt this project into a crypto portfolio management android app as this was more interesting than a web based stock application. has some experience in android app development so Google's platform was chosen over iOS.

Epics

We have split our epics up according to the different functions of our Android application.

Portfolio

The portfolio screen will display an overview of the users current cryptocurrency holdings. This screen will be the main page of our application, maintaining a minimalist and aesthetic design while displaying the following information:

- Portfolio balance

² <https://developer.android.com/about/dashboards/index.html>

- Profit & Loss - Option for alternating between Daily and All time P&L.
- Holdings list - Sortable list with individual P&L and current price displayed.

Critical to the application, the portfolio page will include a manual refresh function for synchronising with the latest market data. Additionally, from the portfolio page users will be able to access the search function (detailed below) and an edit option for removing and ordering coins in the portfolio. All coins in the holdings list will be interactive and take users to their respective coin page.

The portfolio screen will not display any news, charts or in depth statistics on the users holdings.

This epic has an estimated difficulty score of 6.5/10. With a time estimate of 5 units.

Search

The “Search” screen will contain a list of common crypto currency coins that a user can add use to add to their watchlist. It is accessed from the add currency button to watchlist button.

Features:

- A search bar that populates the page when text is typed in.
 - Users can use the cryptocurrency’s full name (eg. “Bitcoin”) or its financial code (eg. “BTC”).
 - Searches are not case sensitive.
- Clicking on a search result adds the selected coin to your watchlist, which you can access from your main (portfolio) page.

Things that are not in this epic’s scope include an automatically updating database of possible cryptocurrencies that can be searched for.

Being a relatively simple page, its estimated difficult score is 5/10, with a time estimate of 4 units.

View Coin

The “view coin” screen is accessed by the user to view useful information specific to a cryptocurrency coin.

It will use tabs to switch between the following screens:

- A graph of the coin’s value over time, which can be set to view in ranges of an hour, day, weeks, or years. Although the price of coins can vary between exchanges, to limit the scope of this project we will use one of the larger exchanges such as Binance. If a user holds some of this coin, statistics relevant to the user such as the coin’s change in value will also be shown.
- A list of the user’s transaction histories for this coin, which may be edited or deleted. If the user does not hold any of this coin, the page will be blank except for a prompt

to add this coin to their portfolio, which will then allow the user to submit the quantity of coins, the date, and the price at which the coin was bought.

- A feed of relevant news articles or other social media posts about this coin. The data will be sourced from an API like newsapi.org, and will be filtered to match news relating to the specific cryptocurrency.

This epic is important for the user as it allows them to keep up-to-date with price trends of their cryptocurrency portfolio, allowing them to make informed decisions whether to invest more or to sell off some of their coin holdings.

Things not in the scope of this epic include the usage of data from paid APIs and the usage of data from more than one cryptocurrency exchange.

This epic has an estimated difficulty score of 8/10 due to the three separate subsections of work involved in this epic, with a time estimate of 10 units.

Settings

The Settings page is an optional epic that contains a series of options that a user can change to modify the UI or functionality within the app. This page is accessed from the sidebar menu, at the bottom of the list.

This epic will only be partially implemented until the end of the project, where if time allows the page will be better fleshed out.

Core features:

- **About page** – Who are the devs? What is the app about? Why was the app created?
What version of the app is currently installed?

Extra features:

- **Day/night mode** – toggles the UI between black and white themes for the app
- **Other theme options** – font, font size, theme colours
- **Export portfolio** – exports your current portfolio to a CSV or spreadsheet file format, for better integration into other applications
- **Changes default trading currency** – eg. to USD or EUR (locality)

Being a (mostly) optional page, this epic doesn't really have a formal scope.

This epic (in its partially implemented form) has an estimated difficulty score of 1/10 (just a static page with information) and a time estimate of 1 unit. In its more fully fleshed out form, the Settings page epic will have an estimated difficulty score of 7/10 (changing app theme, exporting data) and a time estimate of 8 units.

Coin Exchanges

The Coin Exchanges screen will be a separate tab of the View Coin screen. It will display a list of exchanges where the selected coin is available for purchase. From this tab the user will also be able to efficiently check the accepted currencies which can be used to purchase said coin.

For this epic we are including an optional stretch goal. If implemented this feature will display the net cost of purchase and transfer of the coin for each of the displayed exchanges. This cost will be displayed in both ETH and AUD and calculated by summing the following:

1. Funds deposit fee
2. Percentage purchase fee
3. Price of currency
4. Withdrawal to personal wallet % fee

The Coin Exchanges tab will be limited to the top 10 most popular exchanges. All other exchanges are out of the scope of this page. Additionally, the cost of purchase feature will not be displayed if the exchange does not accept ETH or AUD for purchase of the particular currency selected.

This epic has an estimated difficulty score of 8/10. With a time estimate of 8 units.

Hot Currencies

The Hot Currencies screen will be a separate screen of the app, available from the sidebar menu. This page will allow users to see cryptocurrency coins that have recently had a spike in news articles or media about them. This provides value for the user as it enables them to see new and upcoming cryptocurrencies, as well as alert them of any major news (e.g. if a security vulnerability was discovered) about currencies that they may currently holding or be looking to hold, and help them influence their decision.

The scope of this epic will be limited to using the existing news data provided by the news tab of the View Coin screen, and calculating trending cryptocurrencies using that. As we have not fully explored the free APIs available to source the news (and their rate limits), we may need to further limit the scope to cryptocurrencies that a user has viewed (and so the data already lives in a cache) or to the cryptocurrencies that a user holds in their portfolio.

This epic has an estimated difficulty score of 3/10 and a time estimate of 3 units.

Final Epic Selection

From the above epics, we have chosen to deliver the following:

Fully Implemented: Portfolio, Search, View Coin & Hot Currencies

Partially implemented: Settings

Not implemented: Coin Exchanges

The Portfolio, Search, and View Coin epics were chosen as they are critical to our applications functionality and effectiveness. We also believe the benefit which the Hot Currencies epic will bring to our users far outweighs the marginal cost of implementation. As we will be able to directly calculate currency discussion and activity from trading volume and our already implemented News tab of the View Coin page.

While night mode etc, are novel, they are not critical to the main purpose of our design and as such the Settings page will exist with limited functionality.

Finally the decision was made to leave the Exchanges page out of scope as pulling data for fees, and costs live from rapidly growing exchanges is a time consuming task that we can not uphold.

Stand-up/Sprint Schedule

Our team will make use of the Agile methodology, with fortnightly sprints and stand-ups throughout the week. We will also track our sprint work on a Trello board and commit our code to a Bitbucket repository that we have set up.

Stand-up:

- Monday (Online)
- Wednesday (In person)
- Friday (In person)

Sprints:

- Week 3 / 4
- Week 5 / 6
- Week 7 / 8
- Week 9 / Recess Week
- Week 10 / 11

Weekly Meeting Times

- Wednesday, Lyre Lab K17, 13:00 - 15:00
- Friday, Lyre Lab K17, 9:00 - 11:00