**Creating an exclusive, Java based social media application in Android Studio for the dissemination of stock based information between trusted individuals**

**Preparation and planning**

**Background**

Over the past decade I have developed an interest In trading stocks and shares in my free time. I view it as an enjoyable pass time but it does require doing a lot of research. I have found that this hobby gives me a much more optimistic outlook on the world, as it provides me with a clearer picture of some of the technological advancements that may help lessen or overcome a number of the worlds key problems.

In recent years many of my friends have gained an interest in investing, attracted by greater accessibility to trading platforms, a parabolic stock market, easier access to trusted information and, also, by having a friend (myself) who can help guide them through the initial steps required. I have also encountered online acquaintances who I regularly converse with regarding stock based topics.

Both I and my friends do the entirety of our research online where information resources are vast, spread across multiple different websites and apps.

**Problem Description**

The key problem we find is that due to the extensive sources and constant stream of new information it can be impossible to filter through everything and it’s difficult for all interested friends to keep abreast of current events alone and especially in a timely manner, which can be very important when investing in newer more speculative companies. Combine this with the added complexity of trying to interpret poorly researched, purposefully misleading articles and having to decipher any hidden motives in some of the public discourse in online forums and it ends up being a very time consuming enterprise.

Our current system is a group chat, via WhatsApp, which allows for people to post links to resources and any accompanying comments they feel is relevant. This format has an absence of any further functionality and creates a messily structured thread of information that can be troublesome to filter and find old posts. There is a search function but its too basic and lacks the ability to refine it any further.

Over multiple years myself and friends have used a long list of different apps and websites that act as useable forums for communication however none have suited us perfectly in their layout, their level of personalisation and their trustworthiness as they are usually home to scammers and dishonest individuals. This makes it less efficient to for some busier individuals. I will note a few of these applications below my proposed solution and explain why they aren’t ideal alternatives.

**My Proposed Solution**

At it’s most basic principle I would like to create a relatively simple, safe, invite only java based android application that allows for the dissemination of news, links and rumours within a more trustworthy and customisable application. Initially, to tame it’s complexity, I would like the application to only be available to a select group of individuals. As I further develop the application I would like to add more functionality and also open it to a greater number of people in my online social circle and beyond.

In more detail, the application will require registration and the creation a basic profile and it will then require login details to access each visit. The structure of the app will consist of a main page consisting of a thread of, user made, posts. The posts will have a strict and consistent layout, and must contain identifying tags, a title, a hyperlink, a discussion area for comments and, optionally, an image. The tags will specific to what company, sector and what kind of information is being posted (for example financial results or social media rumours). There will be a forum element attached to each post so that users can comment on each post. The main page will also have a search element which will be able to filter the posts in the main thread based on their identifying tags.

Simply this application will be a safer, simpler and free alternative to all current alternatives. This will make the process of staying current on news a lot more efficient as more individuals are sharing the workload of sourcing and pooling information in an more user friendly and personalised environment.

I believe that developing this application perfectly aligns with the Software focus of the my degree route. I believe it makes use of many of the different skills I’ve gained while undertaking this degree course, especially the java based module in year two and the ‘web, mobile and technologies’ and ‘software engineering’ modules in year three.

**Alternatives**

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| **Alternative** | **Reasons why they are inappropriate** |
| Continue using WhatsApp | * Not suitable due to the large messages backlog * Search function is limited |
| Use a different messaging application | * Same issues to WhatsApp * Lacks the ability to create separate discussions around individual posts |
| Use stock twits (popular stock based social media app) | * Open and unfilterable userbase can be problematic and misleading * No functionality to create a closed system or group |
| Use a mainstream social media website to create groups | * Lots of non relevant functionality, for example Facebook has the capacity to create events which would be irrelevant * Not popular amongst potential users due to the nature of social media platforms business models |
| Bloomberg terminal | * Overly complex system, more than what is required * Extremely expensive |

**Major Tasks and Subtasks**

1. **Read TM470 module website**
   1. Review study guide
   2. Review ‘choosing a project’ materials
   3. Review Forum posts
2. **Decide on Project topic**
   1. Review potential topics and Post on forum
   2. Reflect on feedback and finalise decision
3. **Work through TMA01**
   1. Review assessment details
   2. Create a skeleton of the document
   3. Work through TMA section 3.1 – preparation and planning
      1. Work through main sub-headings creating a flawed draft
      2. Review the sections that require attention and create a plan of attack
      3. Review content against learning outcomes
      4. Finalise draft
   4. Work through TMA section 3.2 – Project work completed
      1. Work through main sub-headings creating a flawed draft
      2. Review the sections that require attention and create a plan of attack
      3. Review previous module resources to help create diagrams and wireframe
      4. Review content against learning outcomes
      5. Finalise draft
   5. Create initial wireframe and project files
   6. Work through TMA section 3.3 – Review and Reflection
      1. Work through main sub-headings creating a flawed draft
      2. Review the sections with the biggest issues
      3. Review any module resources needed
      4. Review content against learning outcomes
      5. Finalise draft
   7. Review, finalise and hand in TMA01
4. **First increment of the application**
   1. Build Login and registration page
      1. Review documentation and official guides
      2. Review final authentication choice
      3. Review final login and registration pages design
      4. Build frame of login and registration pages
      5. Embed authentication process into the pages
5. **TMA02**
   1. Work through TMA section 3.1 – preparation and planning
   2. Work through TMA section 3.2 – Project work completed
   3. Work through TMA section 3.3 – Review and Reflection
   4. Review finalise and hand in TMA02
6. **Second increment of application** 
   1. Build first iteration of main page and post creation page
      1. Review documentation and official guides
      2. Review final main page and post creation page design
      3. Build frame of main page and post creation page
7. **TMA03**
   1. Work through TMA section 3.1 - Draft Project report
   2. Work through TMA section 3.2 – Review
   3. Review finalise and hand in TMA03
8. **Third increment of application** 
   1. Iterate on the post creation section to include a comment section for each post
   2. Build first iteration of the separate search page
      1. Review documentation and official guides
      2. Review final search page design
      3. Build frame of search page
      4. Embed search functionality into search element
   3. Add a simplified search element at top of main page
9. **EMA**
   1. Work through EMA section 3.1 – General advice
   2. Work through EMA section 3.2 – Developing your report
   3. Review finalise and hand in EMA

**Life cycle model and schedule**

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| **Lifecycle Model** | **Pro’s** | **Con’s** |
| Waterfall lifecycle | * Suits a Project where the numbers of stakeholders are limited (which holds true in this project) * Has an easily understandable sequentially structured approach which makes it easier to break down into sections, which would be appropriate for this project | * Structured in a way that there is no going back, this would not suit my intentions * Requires a lot of prior experience and knowledge, which I lack * Suits a Task that is routine, where there is familiarity with all aspects of the problem, this doesn’t hold true here |
| Iterative | * Can use alongside prototyping, which is a useful tactic when there is uncertainty about a product or a stakeholders desires * Can follow a adjusted waterfall model whereby there is regular movement backwards and forwards trough the stages | * Using a system that implements evolutionary prototyping creates multiple prototypes with limitations imbedded (for example in scope or design) which can bleed into the final model if not managed appropriately * Would require me to release small fully functioning elements of the application at regular intervals which may slow the |
| Incremental | * By developing simpler increments that are less complex is preferable and more manageable as this project is something relatively new to me * Allows the adjustment of requirements and overall deliverables as I develop experience and gain understanding in the project | * Generally used for larger more complex projects. My personal lack of experience means that this project is larger and more complex that anything I’ve done before |
| Agile | * Has a smaller planning section which means that a useful product will be released on a much quicker timeframe * Incredibly flexible to change due to the close cooperation of developer and user | * Hard to calculate the final costs, primarily time in this case but also financial in a business scenario, due to the flexible nature of the development. * Requires a highly skilled developer, which I am not. |

I believe the best lifecycle model choice for my project would be an **incremental** model. I’m relatively new to an undertaking such as this project, by using a lifecycle model that is malleable and allows for regular change during development is one of the priorities for me. Following an incremental methodology would allow me to gradually build the application out, starting with some smaller and simpler functionalities while also reiterating over certain elements that I may have gained greater understanding in after my initial increment.

**Schedule**

**N.B.** I can’t recall the exact date the TMA’s opened so dates at the start don’t exactly match reality as I created the schedule and iterated on it after the start, I have generally followed the rhythm implemented and will use it as a guide moving forwards.

An unsuitably sized snippet of the schedule is presented below as there is no appropriate way to implement it in it’s entirety into this document. The entire schedule can be viewed in the supporting documents as a PDF, it is called ‘TM470\_Project\_Schedule’.

Graphical user interface, application

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**Resources, skills and methods**

I will primarily be using the Java language to programme the application, this will be done within the Android Studio Integrated Development Environment (IDE) which is provided by Android Inc. I chose these elements as I have gained rudimentary experience in both, during previous modules as well as personal study. They are also the most commonly used constituents in respect to android development and as such have a considerable amount of documentation, guides and a friendly online communities that will prove valuable during development.

I will be using GitHub as a repository for the project which will allow for version control and also be a useful element to supply access to tutors and assessors if required, I have some experience with Git version control from previous modules and have used GitHub before.

The technologies I will make use of for the authentication and database elements of the application I have yet to decide on as these are components that I am not as familiar with and require further research on which choice would be most appropriate, however I am aware of the potential options available.

I will be making use of a small number of potential users, who I will interrogate at specific points throughout production to help further develop the applications requirements.

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| --- | --- | --- | --- |
| Risk | Likelihood | Impact | Overall Risk |
| Potential users become uncommunicative | Low | Medium | Low |
| Failure of computing equipment | Low | High | Medium |
| Miscalculation of planning schedule | Low | Medium | Low |
| Misjudgement of my technical ability and my capacity to follow through in fully developing the project | Low | High | Medium |
| Scope creep affects the schedule I have created | Medium | Low | Low |
| Other modules take up more time and affect project schedule | High | Medium | High Risk |

I will address each risk in turn and explain how I have mitigated them. All of the initial potential users have been selected and there are multiple so in the case that some users withdraw this shouldn’t be an issue.

In the case of computing equipment failing I make regular saves of all my Open university files to a local USB and I also intend to push regular updates to my GitHub repository so in a worst case scenario thee wouldn’t be too much work lost. And I would quickly replace the computing device.

In regards to a miscalculation of the schedule and the misjudgement of my technical ability I intend to allot far more time and effort to the project moving forwards and I intend to expedite my familiarity with the elements of the project and the literature noted in my literature review.

To prevent scope creep I will make sure to regularly temporarily adjust the project schedule and review feasibility of the increased scope and if it’s impractical to add then it will not be implemented.

In the case that other modules vie for more time then I will simply allot more of my personal time to them, I won’t let them affect the project schedule

**Project Work completed**

**Information sources – the literature**

During the course of this project there will be certain elements that I don’t have a wealth of experience in and as such I have taken it upon myself to find some literature that would help build upon and fortify my current knowledge. I am currently reading through these books and I believe they will all prove useful to the development of the project

As such I uncovered **‘Android Studio IDE Quick Reference: a pocket guide to Android Studio Development’** by Ted Hagos that provides some very basic guides for quick reference to each step of the development process from setup of the IDE to preparing the application for release. Most likely this will provide a reference to point me in the right direction for further research or deeper reading of other literature

I am currently reading ‘**Android design patterns and best practice ’** by Kyle Mew, I believe it will prove most useful as the experience I have within android studio is largely informal and may not conform to best practices. This resource will provide more in-depth directions on certain aspects of development that I have not encountered, and be especially important around the best practice in regards to these components.

I have also initially skimmed and I’m currently working through in more depth ‘**Android Programming for beginners – third edition’** by John Horton, this is a much more exhaustive and informative piece of literature and it covers the development of java applications within android studio in even greater depth.

**Project work**

At this stage of the project the majority of the work I have done has been exploratory and preparatory, as such the evidence I provide in this section will reflect this. In regards to the actual body of the project work I have done little more than create the initial skeleton of the project files, ***figure 1***, and created a repository on GitHub, ***figure 2***.

I have spent thinking through and iterating over the initial wireframes which I’ve provided in the appendix as ***figures 3 to 10*** inclusive, I placed them there as there are multiple and it seemed more appropriate. I have also provided these wireframes in a PDF in the ‘supplementary documents’ file alongside this TMA. The wireframes act a visual representation of my design intentions and include rudimentary layouts of all of the pages that the application shall have.

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Figure - File layout within Android Studio

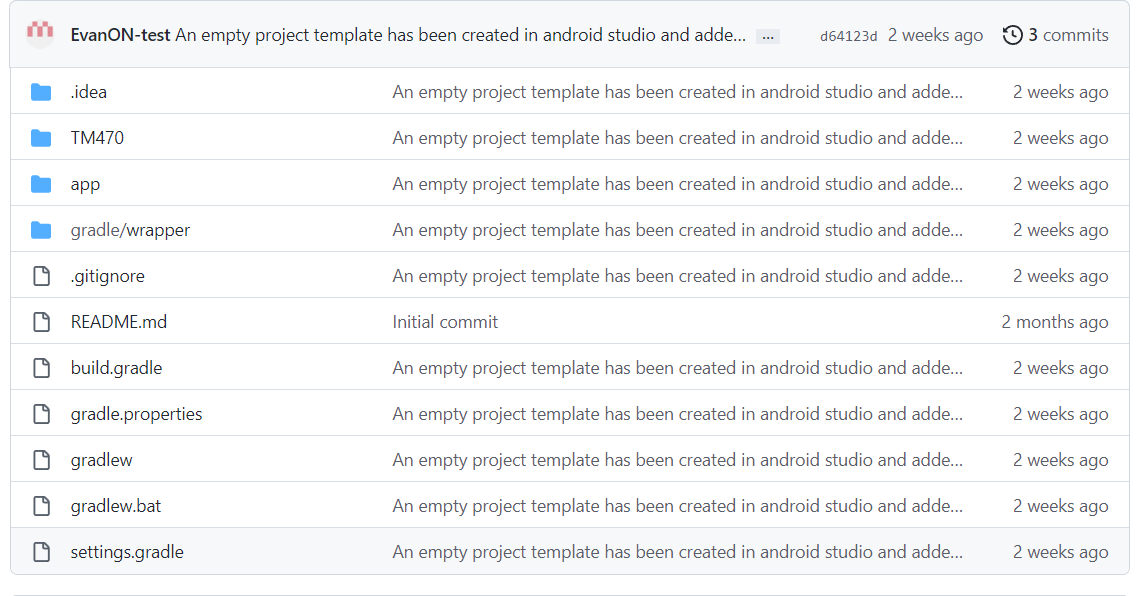
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Figure - GitHub file structure

**Review and reflection**

As of this moment the majority of the work I have completed for the project has been preparatory, I have concentrated on gathering resources, creating a clear foundation for the project and iterating over the application in my mind and on paper to get a clearer image of what I hope to create and achieve.

I believe my exploration of the documentation and resources required to build on my knowledge and guide me through aspects of development within the IDE that I am unfamiliar with has proven beneficial. I have resourced the required documentation and found interesting books through which I can further develop my knowledge. I also believe my initial creation of the wireframes has helped me obtain a clearer picture of how the application will look and this has helped me to reflect and iterate over it to create a better, albeit not perfect, representation of my intentions.

I believe the less structured layout of this module and the less clearly defined elements to the final project and assignment expectations slowed me down initially as it took me time to gather my thoughts as well as start piecing all the elements of the project together. This also lead to me elaborating and adjusting the schedule regularly. I believe through the process of this TMA I have mostly recovered from this issue and this should hopefully prove evident in the next TMA and future presentations of my actual project work.

Throughout the creation of this TMA it has made me realise I haven’t done enough in the form of eliciting requirements and creating a more useful conceptual model of the application which would prove more useful during development.

**Explain how you have been developing the skills necessary for your project, if you do not already have them.**

In terms of managing a project and planning it’s undertaking I have some skills and knowledge acquired through earlier modules within my degree course, these skills have been further developed in more recent modules such as ‘TM354 software Engineering’.

Some of the key skills that are required for this project will be java programming and the skills required to fully utilise the IDE. Previously I’ve covered Java within Open University Modules, I have also spent my personal time developing my familiarity with Java language using a multitude of online resources, however I haven’t used these skills in such a large scale project or to the level of complexity needed here but I am confident that I will manage to adapt and learn throughout the project. I have gathered a sizeable collection of official documentation and helpful user guides, both provided by android which will help me overcome any issues.

**Indicate to your tutor any issues on which you would like specific feedback.**

The areas of concern which I would like some feedback on would be around the scale and complexity of the project. I feel that the project is substantial enough and complex enough to be a good foundation for this module but I would appreciate any input. I’m aware that there are other elements that I could add to the application but I’m not sure on where the line is between having unreasonable aims and creating an application that is too small of a scale. I created a MoSCoW document which has further examples of elements I could add to the application to make it more complex, this is in appendix 2.

**Briefly summarise how your tutor has influenced your thinking in terms of your project choice and how you have agreed to maintain contact with your tutor.**

When I first contacted my tutor I was still in the process of finalising the project and the scale of it. My initial communication with them made me realis that the scale of my project was initially too small and that it needed to be expanded if it was to be deemed appropriate. I had reviewed some of the elements of the project that I had in my MoSCoW table and moved some from the ‘Should have’ to the ‘must have’ section. It was also brought to my attention that there would be some important legal elements that would need to be considered as the application is stock trading based app that could have legal ramifications if trades were made based off recommendations or based off insider knowledge.

I have taken advantage of the tutorial that was held by my tutor and I have exchanged emails, he has also made me aware of the different avenues of communication open to myself and his availability for more direct and extended contact. For now email communication alone has been sufficient for what has been needed.

**References**

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**Appendix**

**Appendix 1** - Incorporating figures 3- 10 illustrating Work Completed

**Diagram

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Figure 3 - Login page

**Graphical user interface

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Figure 4 - Registration page

Table

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Figure 5 - Main page

**Diagram

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Figure 6 - An expanded view of the post layout as it would appear on the main page

**Graphical user interface

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Figure 7 - Post creation page

**Diagram

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Figure 8 - Discussion page that is linked to each individual post. It will expand from the 'comments' element of a post when clicked

**Diagram

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Figure 9 - A view of the menu button when clicked

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Figure 10 - Expanded search page

**Appendix 2** – A MoSCoW template of some of my thoughts on the initial requirements of the application

**Must Have:**

* A form of login process so that only registered users can use the Application
* A home page consisting of a stream of user sourced posts including article links, website links and links to relevant, trusted social media threads (mainly from twitter and reddit)
* The post creation element must force a common pattern, each post must have a clear and informative title, prominent tags denoting the company and sector as well as the type of information is in the link/article/social media thread (for example financial results, production news or social media based rumors) .
* An enhanced element to the link sharing where by a link preview is shown and not just the simple hyperlink itself
* A simple forum element, attached to each post allowing users to create discussions.
* The ability to filter the main page, either into specific companies, specific sectors (e.g. software, EV, Crypto), and information types.

**Should have:**

* The ability to post PDF files (which are a common format of investor deck).
* An improved search function that will search other aspects not just the tags, for example it will search titles and within comments
* The ability to subscribe to various tags, and a push notification that is initiated any time a post is made about a relevant topic

**Could Have:**

* A simple form of stock watchlist allowing the addition of info such as company name, holdings and money invested and even the extension of a profit/loss element based on the current price sourced only on a limited timescale basis (every hour or every day).

**Will not have:**

* Any form of live share price feed.
* Any form of individual static page for a specific company, although as mentioned the feed can be filtered to show specific companies articles, website links and possibly PDF’s.
* Any further trading information relevant to specific companies outside of the post stream. For example no extra info on analyst expectations or trade volume etc.