**Extended Project Diary**

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| Date | Entry |
| 29/1 | My EP idea is to create a futuristic smart-mirror device. This will involve both physically assembling the hardware as well as developing the code to power it. I predict the main challenges to be learning an entirely new programming language – as I will be going into the project without any experience with Java. I was inspired by an article in the International Business Times. |
| 05/2 | I have thought about opportunities for primary research in my EP title. An idea I am considering are incorporating a marketing aspect as a consumer device. |
| 12/2 | In the past week I have constructed diagrams and 3D models of the final product and incorporated this into my final write-up. I have begun the Codecademy course for Java basics (Units 1 & 2 on “Java Basics” and “Conditionals and Control Flow”) and acquired what seems to be a suitable monitor to serve as the display. |
| 14/2 | Today I completed the “Java Basics” course after finishing the final unit “Data Structures”. |
| 20/2 | Attended a Freeformers “Learn to Code” event at Barclay’s Eagle Labs. Introduced to alternative developing methods. Found a suitable monitor/TV for my smart mirror display after rummaging around in my garage. Tested with an Android phone. |
| 21/2 | Had some more time to try out my new TV. It seems unable to rotate the display, so may have to alter original design from a portrait mirror to landscape. Emailed a developer at Freeformers with some questions about app development. |
| 22/2 | Received a detailed and very helpful reply from the developer. Considering alternative solutions to my original plan including web development. |
| 24/2 | I have researched web development and hybrid mobile development it looks like it may be a better fit for my project. |
| 29/2 | Had a meeting with my mentor this morning to discuss my EP project. |
| 4/3 | Found another smart/magic mirror project that is powered by HTML and JavaScript, like I am planning. <https://github.com/MichMich/MagicMirror> However, this solution also uses a Raspberry Pi instead of a phone. |
| 11/3 |  |
| 18/3 |  |
| 24/3 | I had some free time to start looking at adding basic functionality to my mobile app today and began researching different methods to implement a time display. |
| 25/3 | I successfully created my first hybrid app with Apache Cordova. |
| 27/3 | I implemented a basic clock in my app. It runs with no errors on my phone. |
| 1/4 | Today is the last day of the Easter holidays. Unfortunately, due to exam preparations I had very little free time to make progress on my project. From now to the end of my exams all development will be put on hold. |
| 21/6 | I finished my final exam today. After a short break, to recover and celebrate the end of exams, I plan to resume work on my project. |
| 29/6 | After some research, I discovered the simpleWeather API which provides a means to display weather data on my mirror <http://simpleweatherjs.com/>. |
| 1/7 | Proceeded to implement basic text weather output. I began to format and style it but I ran into some issues. Hopefully I will find time to finish it tomorrow. |
| 2/7 | Invested a lot of time into fixing the styling on the current weather data today, and fortunately it paid off as it is pretty much complete. |
| 5/7 | Implemented forecast output. |
| 9/7 | I spent the last few days trying to figure out the styling on the forecast, and after struggling with the icons I have finally finished it. At this point I can call my app the Minimum Viable Product. |
| 12/7 | Implemented a display that selects a random famous quote from an array. |
| 14/7 | Changed the famous quote to a greeting that is selected depending on the time of day. I think that this creates a more personal feeling which is one of the key goals of this device. |
| 18/7 | Added calls to the Google Maps API, however this feature is not close to being ready yet. |
| 21/7 | The summer holidays have begun so I will have significantly more time to dedicate to this project. |
| 24/7 | I decided to shift focus to speech recognition as I feel this has a higher priority than the maps. I found a plugin for speech recognition <https://github.com/macdonst/SpeechRecognitionPlugin> and did some very basic tests to show that it works. |
| 25/7 | Improved recognition toggle (on touch) and added visual indicator. |
| 28/7 | I have been having some infuriating problems with the speech recognition, but I managed to diagnose the problem as being an issue with the Google app on my phone. Downgrading the version has fixed this. I also fixed some issues with deferred timer error calls. |
| 29/7 | Added a “play music” option for speech recognition and optimised the function. Changed the switch statement to a much more versatile if statement. |
| 1/8 | Found and implemented a speech synthesis plugin by the same person <https://github.com/macdonst/SpeechSynthesisPlugin> and looked at possible Spotify integration for the music player. There looks to be a couple of plugins available but I am having trouble getting them to actually do anything |
| 3/8 | Successfully added Distance Matrix API support for distance and cycling time to destination after many hours of reading the dense Google documentation. |
| 4/8 | Added default “home” and “work” (Hills Road) locations for the Distance Matrix API. Also did some more work on the Spotify integration but one plugin is only supported for iOS and the other seems to be completely outdated and broken. |
| 6/8 | I spent today carefully tearing down the TV to extract the LCD and expose the circuit board without electrocuting myself. |
| 7/8 | Added a function to fetch the BBC news RSS feed but I ran into some problems when trying to display it which seems to be broken for seemingly no discernible reason (a surprisingly common issue in computer science). I am currently trying out a solution that utilises loops to load each item into the array, which could then be displayed in a list. I also optimised the distance function by cutting out a lot of unnecessary code. |
| 10/8 | Spent a significant amount of time today trying to get native Chromecast integration working but I couldn’t. Instead it broke my entire app, which was incredibly frustrating because I had to reset and reinstall everything which involved deleting a lot of files without quite knowing what they do. I have a suspicion it’s because the plugin hasn’t been updated in a while. |
| 11/8 | Added geolocation support for the weather. This means that the app uses GPS to get weather information. The only issue being that GPS has to be turned on. |
| 12/8 | Ordered mirror cut to size 432mm x 256 from cutplastic.com will take a little while to arrive.  I added a default location so that theoretically if geolocation is unavailable it will default to another location. |
| 15/8 | Finally fixed the RSS feed array and added a pop-up window for the RSS news feed and added speech recognition functionality for it. |
| 20/8 | Mirror arrived today. Will not have time to test it unfortunately as I am busy with other things. |
| 21/8 | I got the opportunity to inspect and test the mirror today. The effect works very well, however it has been cut a few millimetres too big. Preferably I will be able to find a solution that doesn’t involve cutting it as this has a very high chance of completely wrecking the mirror. Perhaps sandpaper? |
| 22/8 | Today I began researching methods to attach mirror to screen. I plan on using some type of glue to stick the mirror to the bezel (metal bit around the outside) of the LCD. I contacted an engineer friend of mine for guidance. He recommended Loctite (superglue) or Araldite (2-part epoxy). It seems that Loctite would be the simpler and lower risk choice. |
| 23/8 | I ordered some Loctite on amazon.  I also designed the app icon and added a crude translate function |
| 24/8 | Optimised speech recognition. Cleaned up and structured messy code for readability. Worked on more optimisations to the directions matrix by moving function calls around and deleting redundant code. Added speech support for translations which involves changing the language of the voice. Also bought NFC tags on Amazon. |
| 28/8 | I have had time to experiment with the NFC tags and I added NFC auto launch. This means that upon touching your phone to the NFC tag the app will automatically open. |
| 31/8 | I was in college today, so I took the opportunity to ask an electronics teacher about what to do about the size of the mirror. He suggested adding wood or plastic to fill the space as an alternative to cutting down a few millimetres which is not a solution I had considered. I took the time to test the app with my Chromecast, however it wouldn’t connect. |
| 1/9 | I solved the issue with the Chromecast.  Today I also bought some wood strips, cut them to size and stuck them along the edges of the mirror. I did have some concerns about this due to the backlight circuit. Then I glued the mirror to bezel. I did some cable management with electrical tape. |
| 3/9 | I went into college again today to test everything would work with the school Wi-Fi. Unfortunately I ran into some major problems due to the way that the college’s network is set up (MAC addressing). Furthermore, I am going away tomorrow and will be unable to work on my project for a few days. |
| 7/9 | After testing some solutions involving a laptop router hotspot, I have decided to settle on a solution involving screen mirroring to my laptop. |
| 8/9 | The solution I had intended didn’t actually work so I had to think up another solution on the spot. I asked my friend to create a mobile data Wi-Fi hotspot and fortunately I just got it working in time for my presentation. |
| 16/9 | Now that the marketplace is over, I will be focusing most of my efforts towards the final write-up and documentation. While I have written a large bulk of it parallel to my app development, there are still some sections, such as the marketplace review that are yet to be completed. |
| 22/9 | After some thought, I decided to reorganise my EP document into a more logical order. I finished the final section of my Project Progression Record. |
| 30/9 | Today I applied the finishing touches to my document and finalised it. |