Major Project Logbook

20/10/2014

Today we got the notification of the first part of our assessment task. This first part, defining and understanding the problem, is probably the most finicky and seemingly most useless part of the major project assessment. But in terms of the Software Design and Development timeline it is almost the most important. Although in many Software design approaches, the defining stage is fairly unimportant – including RAD, agile and prototyping but in the approach I am using, a custom mixture of structured and agile, the defining stage is extremely important if not fundamental part of my project.

23/10/2014

This week has mostly been a week for considering considerations for the design phase of my software major project. The considerations I made include:

* The Design Approach
  + I have swapped a few times between Structured, Agile and a mixture of the two as well as the prototyping approach. I am still considering which to do and will have to look further into how they will affect the timeline of my project overall
* The language I would be using
  + I’m fairly sure my project will use Python, but to interface with the hardware of my project I may need to dabble in C++ and or lower level languages.

These two parts of my project are probably some of the most important of my whole project and will probably have to be considered and contemplated for the remainder of this part of the assessment

27/10/2014

This is the second week that we have had this first part of our assessment task. The defining stage of our assessment overall includes taking into account the perspectives of the User and the Developers from opposing perspectives. My idea, being a student management system aimed at my own school, is fairly easy to know the specifications of. Even taking this into account I still need to contact users – students, teachers, etc… to find out the exact specifications of what they want and how they want to be able to use it. I will start this communication at some point in the future but for now I will contemplate the specifications that I have defined myself as the user and developer

29/10/2014

Today I solely thought about how my hardware will work and and how the components will work together. The Hardware I will be using consists of:

* 7” Touch Screen
* Raspberry Pi (128Mb)
* RFID/NFC Card

The Touch screen interfaces with the Raspberry Pi through a graphics board and an HDMI cable. The Raspberry Pi interfaces with NFC/RFID card via IO ports

3/11/2014

Today was a fairly un-productive day for me in terms of my project. I have attempted to get the Gantt chart creator I have previously used working but apparently IT has decided my computer isn’t to run Java. This problem will take a fairly long while to fix if my experience has told me anything but I can’t be sure as of yet.

6/11/2014

Today I enquired with teachers as to what they thought of my project and what features they would want if this new system was to be implemented. This dialogue didn’t go very in depth but it did still give me insight into what people really liked and what they didn’t like so much.   
  
As well as this today I started on some of the harder documentation today Including System Flowcharts, Structure Charts and Data flow diagrams

10/11/2014

Today I have contemplated putting up a survey onto social media so as to start more dialogues on features and functionality that people want and would use. The survey would only have 5 or 6 questions but would ask if my project is really needed and what about it its needed the most.

Additionally to this I have started to contact people about 3d modeling a case to be 3d printed and used for my project. So far I have only talked to one person but they have expressed interest in helping me with this project.

13/11/2014

Today was an extremely productive one. I have started and finished work on the following elements of my project:

* Storyboard
* Data Dictionary
* System Flowchart

Although these parts are finished they made need some sort of revision at some point due to changing needs and the dynamic nature of the way I think about problems.

In addition to this, recently I have been given all the needed parts of hardware to get my project running, so today I drew up a plan of how I am to connect all of these elements in an efficient and practical manner. Unfortunately this also raised a few issues to my attention including my lack of knowledge in the field of soldering and my deficit of breadboards, wires and power supply’s.

17/11/2014

As the due date for this part of my assessment gets closer, I have started devoting more time and effort into this assessment. Trying to gather more knowledge and know-how in terms of the hardware and similarly gathering information on how to write some of the documentation. The documentation in particular that I need help with is the stuff we haven’t done in previous years and have been taught little to nothing about including:

* Quality Assurance
* Identifying the Problem
* User Feedback
* Test Data & Expected Output

Although ‘Identifying the Problem’ and ‘User Feedback’ are fairly self-explanatory which has made it exponentially easier to construct these myself. By fair the factor that makes it the hardest to learn about these elements of documentation is that we are going on with mostly irrelevant course work in class, which is fair enough, but indeed it does not help to complete a Quality Assurance criteria when we are learning about exponential, linear, hyperbolic, etc time.

20/11/2014

Finally I have created a working model of my project! And by working I mean the green light stays on for longer then 3 seconds and by project I mean the RFID/NFC module, although it won’t be properly working until I can solder the wires into the module and get the API/Library/Binaries to compile and work properly. Furthermore today I was able to get a start on some of my Quality Assurance criteria, after many periods of inconspicuously searching the internet for examples of Quality Assurance criteria I found a few useable recourses. Unfortunately for me these recourses got me nowhere in the eyes of our assessment, giving me only code tests I already knew of including but not limited to:

* Rubber duck checking (my personal favorite)
* Speed tests
* Peer Checking
* Code Criteria
  + Casing
  + Commenting (Intrinsic and explicit)
  + Sub routine length limiting

Additionally to the problem that these are only a small number of tests, they only apply to the code and as such give me no ability to test my system as a whole and other parts that are more user orientated.

24/11/2014

Today I finally decided to publish a survey, using Google forms, I constructed a 6 question survey that attempted to prove there is a need for my project and then find the specific features people liked best. Here are the specific questions:

**1. What is your role in Emanuel School?\*Required**

* Student
* Teacher
* Admin Staff
* Other:

**2. What Time Do You Get To School Each Day?\***

**3. Do You Catch The School Bus?\*** 

* Yes
* No

**Do You Think There Is A Problem With Our Current Attendance System?\*Required**

* Yes
* No

**If You Answered Yes To The Last Question, Please Expand On Said Problems.\*Required**

**Do You Think We Need A New Attendance System?**

* Yes
* No

**What Would You Like To See In A New Attendance System?\*Required**

**Do You Use Edumate To Check Your Calendar?\*Required**

* Yes
* No

**Do You Like The Idea Of An Opal Card Style Attendance System\*Required**

* Yes
* No

**Would You Use Edumate More If You Could Check Your Calendar Using Your Opal Style Card At A Computer Around The School?\*Required**

* Yes
* No

As is quite plain to see this survey goes about, quite bluntly, answering the questions I want to know. Hopefully soon enough I will know of the answers to this survey. It’s interesting to note that, in my mind, the point of the survey is more to cement the need for the product I have developed from a student point of view rather than a teacher and/or administrative point of view.

27/11/2014

This evening, in a vein attempt to relax, I have started to force the raspberry Pi I am in possession of to work. In short all this means is for the touch screen to work in a calibrated fashion, sensing a finger and moving the mouse accordingly from a relatively precise starting point. Unfortunately computers don’t really like me and so this did not happen, but rather at first the touch screen didn’t work at all. After fiddling with wires and power supplies for a while I finally had some idea of what was happening, I needed a driver to get this touch screen to interface properly with the Pi. I though this might happen so I was prepared and installed an program on a kernel level that is built to help the raspberry pi specifically interface with the touch screen I had purchased. At this point I would again like to note that computers really don’t like me and so, as could only happen to me, the program did not see the interface. This forced me to search around on the internet for a few hours whilst the raspberry Pi sat there and though about what it had done wrong, so as usual it sat there in an idle state. I think it’s interesting to comment that quite a few things have gone wrong with this set up that the website assured me wouldn’t with it’s introductory video:

* The power supply was not there and neither was the needed polarity
* The drivers were not noted down anywhere – on the internet or intrinsically
* The way the screen was to be physically connected, although fairly menial, was not noted ANYWHERE and so I had to guess and check almost as much as I do in 3 unit maths
* Lastly the only way of knowing whether the touch screen is working or not is this tiny green LED on the smallest power board you have ever seen

All in all this touch screen has been one of the biggest pains in this project so far.

1/12/2014

On a very fitting date, today was like an early Christmas for me. After sending the link for my survey to many a person, when I checked the responses this afternoon it seemed I had accumulated quite a few responses (20 in fact). These responses ranged from silly and not at all useful characters instead sentences to extremely constructive feedback. Bellow is a sample of some of the better responses:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student | 8:40:00 AM | Yes | Yes | Too many kids are being too lazy and are not signing in at the office. | Just like at Sydney Boys, each student should have to swipe a card as they walk through the gates which will monitor on the school system what time kids arrive and leave school.  Each student should get assigned a card. | Yes | | | Yes | | Yes | Yes |
| Student | 7:45:00 AM | No | No | It's hard to tell really, I think the computer system stuffs up attendance too frequently though. | Something easy to follow and more reliable that doesn't say someone isn't here when they are | No | Yes | Yes | | Yes |
| Student | 8:00:00 AM | No | Yes | Occasionally, even though on an excursion students are marked as absent | An online way for students to give their reasons for not attending school or being late | Yes | Yes | Yes | | Yes |

As you can see these responses were actually useful and do infact cement the need for the project I have created. Hopefully, as soon as Mr Drake sends my link to the teachers and Admin staff, I will get some more responses from a different, but still as important, demographic.

4/12/2014

Thankfully after looking around the vast expanse of the internet for a little while, I found a very nice German gentlemen who had developed a bootstrap/ XBMC application that interfaced with the touchscreen perfectly even though the program was originally built as an in car entertainment system. So after trimming the fat of his beautifully coded application I was able to get the touch screen display calibrated and working with Raspbians default IDE. This sets a very nice basis and creates a well needed proof of concept that will only be topped by the first working prototype of the much more finicky NFC/RFID module.

In addition to the hardware part of my project, which seems to have taken over my last few days, I have also finished off some of my design documentation including:

* Storyboards
* Development Approach
* User Feedback
* Log Book (Up to Date)
* IPO Diagrams
* Context Diagram
* Data Flow Diagram
* Structure Chart
* System Flowcharts
* Data Dictionary

The only pressing pieces of documentation are:

* Gantt Chart
* Social and Ethical Issues
* Test Data and Expected Output
* Identifying the Problem in it’s fullness
* Quality Assurance

8/12/2014

Today has been a fairly productive day, although I haven’t exactly done a lot. I am finalizing my documentation as the project is due at the end of this week and as such I have added the finishing touches to the following documentation:

* Social and Ethical Issues
* Development Approach
* Test Data and Expected Output
* Gantt Chart
* Data Dictionary

In addition to all of these I have finished off my Project website, uploading a zip file of all my documentation to said website. After this I then went on to survey more of my user feedback to find that I had a few more entries, which have only affirmed the need for a new system.

13/12/2014 – 28/01/2015 Holidays

Over the holidays I accomplished very little in terms of actual documentation, but in terms of hardware and software I have made a lot of headway. Over the 1 and a half months of holidays we were allotted I was able to finish a hardware prototype of my project where all the parts were connected together. Technically this should’ve have enabled me to connect and retrieve data from these peripheral devices but as is always, some part of the computer held me back from doing so. In this case, I believe it is the operating system that is not allowing me to complete a fully functional prototype. Overall the holidays were an extremely productive time for my project’s hardware prototyping and to an extent the software side, but to no extent a productive time for my project documentation, as is rendered obvious by this short project log entry. This pretty much leaves me at a complete loss about this project. There are some work arounds to this but they’re completely uneconomical and completely contradict the purpose of this lightweight, easily implementable, affordable system.

30/01/2015

Today, with the starting of school and other such distractions, I was unable to really make much progress into my project, and as we don’t have the notification for our the next part of our project yet I can’t really accomplish anything apart from trying to get a working version of my prototype, which I will ask Mr Drake to help me with at a later date. To summaries this in dot point form:

* Build a working prototype
  + Ask Mr Drake for help with this
* Find the date and requirements of the next hand in assessment

3/02/2015

Although, Today, I’m still at the same point with the building the actual prototype, I have been able to specify what the actual problem is with the prototype I have. The specific problem I have found with my prototype is that it can’t access both the touch screen and the NFC/RFID chip at the same time, which is an obvious problem for the prototype and the end product. The only thing I can see that would cause a problem like this is not enough of the necessary drivers in the install of the Touch Screen. The method I’m using cross – compiles the kernel on a different machine, adding drivers for the touch screen. It is important to note that this is the point I think that this may be the step that negates the drivers that make a data transfer across the GPIO pins possible. The only reason I say this is that before the cross compilation I can access the data polled using a program from the standard library. Once the cross compilation is complete and I mount the new kernel on an SD card the Touch screen does tend to work after a bit of fiddling but the NFC/RFID chip definitely does not.

5/02/2015

This week I still haven’t been able to talk to Mr Drake because of our conflicting schedules but I have made a bit of progress into new ways in which I can compile a new kernel with drivers for touch screen support. The first being a graphical interface with underlying UNIX kernel which would allow me to confirm the drivers I want to be installed for a compilation and mounting by the Raspberry Pi itself.

10/02/2015

After thinking about my project for a bit longer, I feel I may not have explained the problem completely so I will try to do it again in proper English. The problem is that the prototype was unable to retrieve and send data to both the touch screen and the NFC/RFID chip on the same build. To explain this in better English, one build of the operating system for the Raspberry Pi was able to utilize the touch screen to its full extent of usage – including posting to the screen, retrieving mouse input and utilizing that input. Unfortunately on this same build it was unable to connect and retrieve information from the NFC/RFID chip whereas on a separate build version the raspberry pi OS was able to. After finding new ways of adding the needed drivers to the OS and installing and re-installing these drivers, I was still unable to find a configuration in which both the NFC/RFID chip would work as well as the USB TTF 7 inch Touchscreen.

12/02/2015

In the last few days I have attempted the new method of compiling a new kernel and unfortunately, as I have learnt in the last few days it takes a genuine millennia to compile. Like I’m talking about a whole day and night for it to compile on the raspberry pi, and then even longer to mount and check if it is even slightly functional. This makes it very hard to attempt more than one compilation per week making it extremely hard to go about a trial and error method in making the NFC/RFID chip co-exist with the Touch screen.

17/02/2015

Today was the second trial at compilation I have done and it yielded some results. I wasn’t able to get the two peripherals to work on the same build of the kernel but I did get an interesting error message from the NFC Chip:

error libnfc.driver.pn532\_uart pn53x\_check\_communication

error lt-nfc-poll: ERROR: Unable to open NFC device.

What this does is it reaffirms my theory that it is in fact a GPIO driver that is missing and causing the OS to not be able to connect, communicate or retrieve data from the NFC/RFID Chip. What this means in the long run is that there will need to be many more trial runs of this, adding and re-adding different libraries and drivers to try and see which configuration works, if any at all.

19/02/2015

24/02/2015

26/02/2015

3/03/2015

5/03/2015

10/03/2015

12/03/2015

17/03/2015