Project Title: eyeRS

08/02/2017 - 20/10/2017

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1. Group and customer information

Group number	5
Group name	eyeRS Development Team
Members	**Student number:** M4DDK8SQ1 **Name:** Nathan **Surname:** Shava
	Student number: XQ9X3WV31 **Name:** Matthew **Surname:** Van der Bijl
	Student number: MB2015-0785 **Name:** Emilde **Surname:** Arsenio
	Student number: Z46WWQH76 **Name:** Andrea **Surname:** Cloete
	Student number: MB2015-0219 **Name:** Sajjaad **Surname:** Ishmail

Customer	**Name:** Ndai Mapaso **Company:** CTI Education Group **Industry:** Information Technology

2. System proposal

2.1. Overview

Our company, eyeRS Development, was requested to design a mobile application. The mobile application is called eyeRS and will be designed by a team consisting of five members, namely;

- Nathan Shava;
- Matthew Van der Bijl;
- Emilde Arsenio;
- Sajjaad Ishmail; and
- Andrea Cloete.

The reason why our company were appointed to develop this mobile application is because they noticed that multiple individuals in all age groups are finding it difficult to manage and organise their personal and professional lives.

The customer's name for whom the mobile application will be developed for is Ndai Mapaso, the lecturer of the Software Development Project 2 (ITSP200) module which forms part of the for BSc Information Technology course at CTI Education Group.

The solution to this problem mentioned above is to develop the eyeRS mobile application for Android operated devices. The application will be developed to run on this platform considering that the Nielsen Company (2016), proved that 53% of smartphone owners use the Android operating system. This will allow the application to target a larger market compared to any other mobile platform.

The application will assist individuals who need relief in their day to day lives. The mobile application will allow the user to catalogue their personal belongings and beloved items in an organised and easily accessible picture format. It will also enable the user to deal with admin, trading, sharing and the searching of personal possessions, all in one mobile application that can be accessed anytime and anywhere. The mobile application will provide the opportunity for its users to be connected to their possessions all the time.

Although there are similar applications like Closet+ and ONSIGHT, development of the eyeRS application will bring a new and improved way in the cataloguing of users' possessions. This will be achieved by implementing the objectives outlined in the requirements specification.

2.2. Aim

The proposed eyeRS mobile application (eyeRS app) is designed to allow users to catalogue their personal effects and beloved belongings while creating a platform to facilitate the trade of their items in the future.

2.3. Objectives

The objectives of the eyeRS mobile application are as follows:

- To deliver a successful and reliable personal cataloguing mobile application that will solve the day-to-day needs of its users by 23rd of October 2017;
- To develop a mobile application that will reduce the workforce required to execute the user's daily tasks;
- To reduce the complexity of completing all the functions that are provided by the mobile application by the 23rd of October 2017.
- To allow first time usage of the application to present users with an in-app tutorial on how to use and manage the application;
- To provide a user friendly application that will allow its users to easily navigate between different functionalities of the mobile application;
- To produce an affordable mobile application that will meet user's specific needs.
- To allow users to identify their items in a visual format (e.g via a picture);
- The allow users to state a short and descriptive note about each catalogue item;
- To develop a mobile application in an efficient and effective manner that is delivered on time; and
- The usage of the application can be done connecting to the internet as well as offline mode.

2.4. User Requirements

Functional Requirements

- The user must be able to add a new catalogue item to the application with the item's name, short description and an image taken using the built-in camera;
- The user should be able to add an image for a catalogue item from the device's local gallery;
- The user should have the ability to assign a PIN to lock the application for security purposes;
- The user should be able to connect the application to the internet in order to share catalogue data with other users via WhatsApp;
- A user should be able to share items on their catalogue via a unique QR code.
- The user would like to receive a notification/alert when another user has sent them a link for an item of interest that they wish to trade for;
- The user should be able to mark a catalogue item as being up for sale and share the information with other users via Bluetooth or externally via WhatsApp; and
- The user would want the application to backup data so as to allow recovery of their catalogue items should the application crash for any reason.

Non-Functional Requirements

- The user should be able to change the layout of the catalogue items (e.g. switching between grid/list view formats);
- The user requires the application to be available for use when needed (i.e. any time of the day);
- The user requires the response time of the application to relatively fast to improve the overall experience and acceptance of the application;
- The user requires the application to have a user friendly interface where they can easily navigate between the different functions of the application;

- The user should have ability to give feedback and personal reviews of their experience with usage of the application or should they also encounter any challenges in which they would require assistance; and
- The user would like to have the ability of changing the colour scheme (i.e. theme) of the application.

Technical Requirements

- The user requires the application to be able to make use of the external storage memory so as to avoid using up internal storage space;
- The user requires the application to operate efficiently without lagging when opening or running the application;
- The user requires the mobile application to support a minimum Operating System (OS) version of Android IceCreamSandwich (4.0.3) or higher;
- The user requires the application to be suitable for any mobile screen size; and
- The user needs the application to consume minimal battery life.

2.5. Hardware & Software Requirements

The table below is a list of the minimum system specifications for developers to build the mobile application using the Microsoft Windows platform:

Hardware	Software
Desktop/Laptop processor requirements for accelerated emulator: ● 64-bit architecture; and ● Intel processor with support for Intel VT-x, Intel EM64T (Intel 64), and Execute Disable (XD) Bit functionality.	Microsoft Windows 7/8/10 (32-bit or 64-bit).
QWERTY/Dvorak Keyboard & Optical mouse	Java Runtime Environment (JRE) 6 or higher and Java Development Kit (JDK) 8 or higher.
Network adapter with the following recommended specifications: ● Bus Type: PCI Express; ● Industry standards: IEEE 802.11b/g/n; ● Interface: Wireless/Ethernet; and ● Maximum Data Transfer Rate: 802.11n: 300 Mbps.	Android Studio 2.2 or higher (1674 MB required disk space).
4 GB RAM minimum (1GB RAM for the Android Emulator and 8GB RAM recommended (Google, 2017).	Android Software Development Kit Manager (SDK Manager).
2 GB of available disk space minimum; and 4 GB Recommended (500 MB for IDE + 1.5 GB for Android Software Development Kit (SDK) and Android Virtual Devices (AVD) manager).	Android Virtual Device Manager (AVD Manager).
Desktop/Laptop display monitor with 1280x800 minimum screen resolution.	

The table below is a list of the minimum system specifications for developers to build the mobile application using the Linux platform:

Hardware	Software
Desktop/Laptop processor requirements for accelerated emulator: ● 64-bit distribution capable of running 32-bit applications; and ● Intel processor with support for Intel VT-x, Intel EM64T (Intel 64) and Execute Disable (XD) Bit functionality, or AMD processor with support for AMD Virtualization (AMD-V).	GNOME/Unity or KDE desktop environment Tested on Ubuntu 12.04 LTS, Precise Pangolin (64-bit distribution capable of running 32-bit applications).
QWERTY/Dvorak Keyboard and Optical mouse.	GNU C Library (glibc) 2.19 or later
Network adapter with the following recommended specifications: ● Bus Type: PCI Express; ● Industry standards: IEEE 802.11b/g/n; ● Interface: Wireless/Ethernet; and ● Maximum Data Transfer Rate: 802.11n: 300 Mbps.	Android Studio 2.2 or higher (1674 MB required disk space).
4 GB RAM minimum (1 GB for the Android Emulator (Android 2017)) and 8 GB RAM recommended.	Java Runtime Environment (JRE) 6 or higher and Java Development Kit (JDK) 8 or higher.
2 GB of available disk space minimum and 4 GB recommended (500 MB for IDE + 1.5 GB for Android SDK and emulator system image).	Android Software Development Kit Manager (SDK Manager).
Desktop/Laptop display monitor with 1280x800 minimum screen resolution.	Android Virtual Device Manager (AVD Manager).

The table below is a list of the minimum mobile specifications for the customer and/or other users to run the mobile application:

Hardware	Software
Chipset: ARM-based or better.	OS Codename: Android IceCreamSandwich or better.
Memory: ● 750 MB RAM; and ● 2 GB Flash External; or better.	OS Version: 4.0.x or higher.
Storage Type: ● Internal; ● Mini SD; or ● Micro SD.	OS API Level: 15 or higher
Primary Display: ● QVGA TFT LCD or larger; and ● 16-bit/16M colours; or better.	Browser: ● HTML; and ● Adobe Flash Lite or better.
Navigation Keys: ● 5-way navigation; ● 5 application keys; ● Power; ● Camera; and ● Volume controls; or better.	Messaging: ● SMS; ● MMS; ● Email; and ● Push Email; or better.
Camera: 2 MP CMOS or better	
Sound: ● Loudspeaker; and ● 3.5mm audio jack.	
USB: Standard microUSB v2.0 or better.	
Bluetooth: v1.2 or better.	
Network: ● (2G Bands) GSM 850 or better; ● (3G Bands) HSDPA 900 or better;	

• 4G Bands LTE band 1(2100) or better; • GPRS; • EDGE; • GPS; and • WLAN (Wi-Fi 802.11 b/g/n) or better.	

2.6. Project Schedule

Deliverable 1 Gantt chart

Figure 1 below indicates the Gantt chart of the group and customer information and the system proposal that forms part of the deliverable 1.

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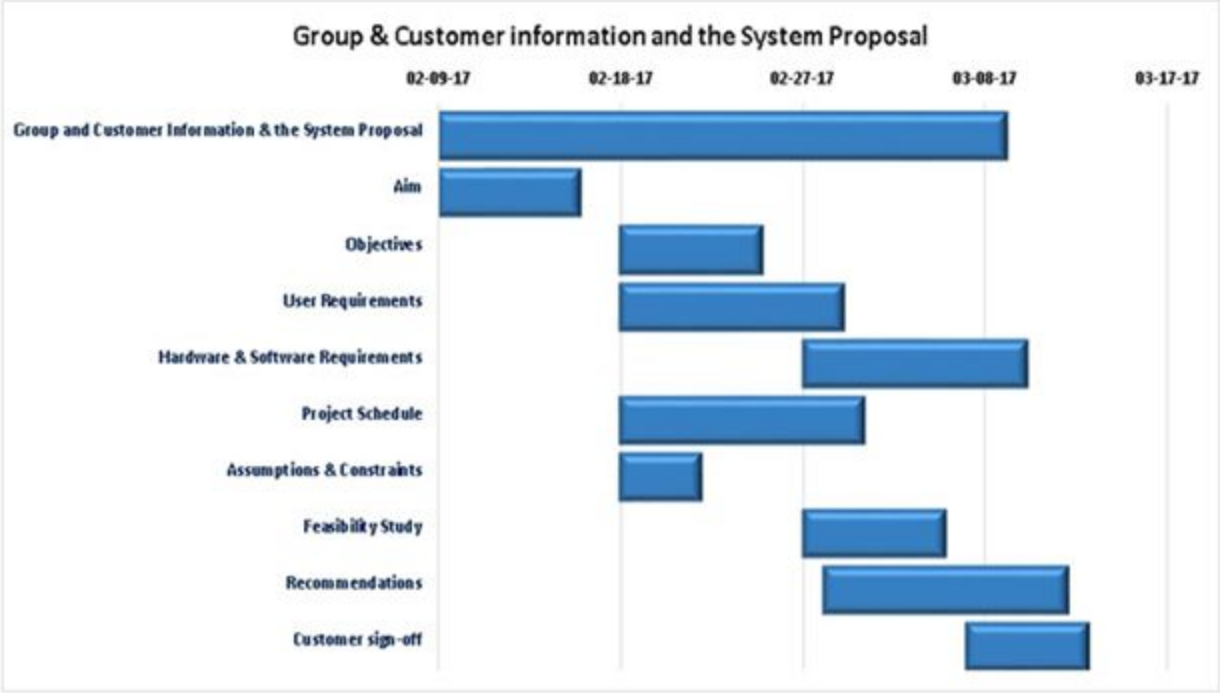


Figure 1

Deliverable 2 Gantt chart

Figure 2 below indicates the Gantt chart for the methodology and user requirements documentation that form part of deliverable 2.

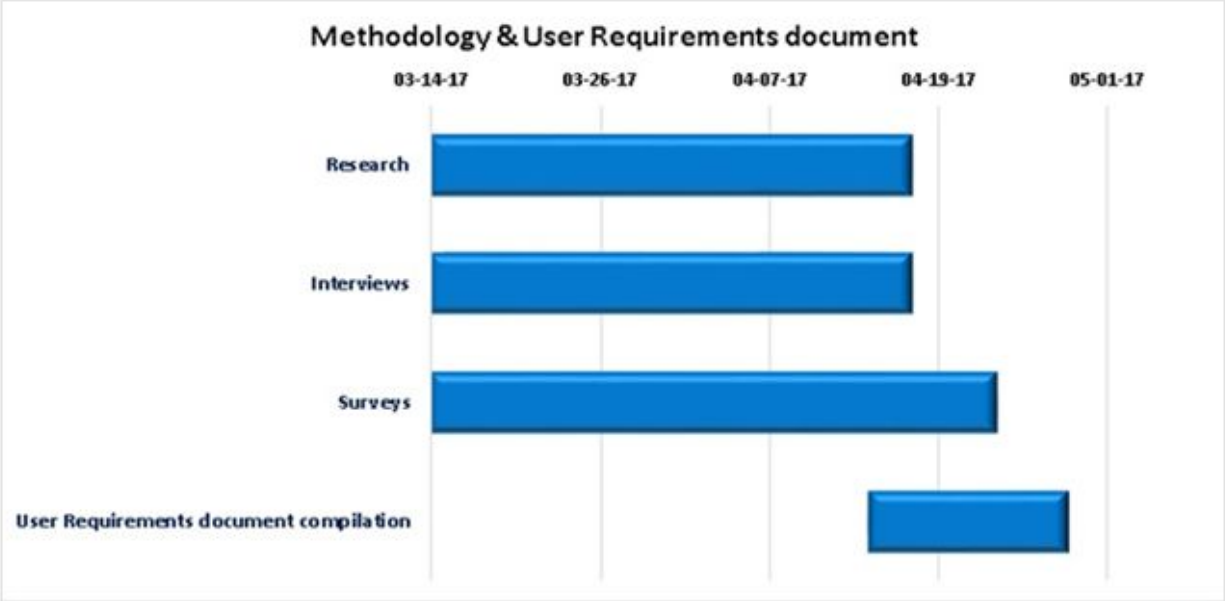


Figure 2

Deliverable 3 Gantt chart

Figure 3 below shows the Gantt chart for the system logical and physical design that forms part of deliverable 3.

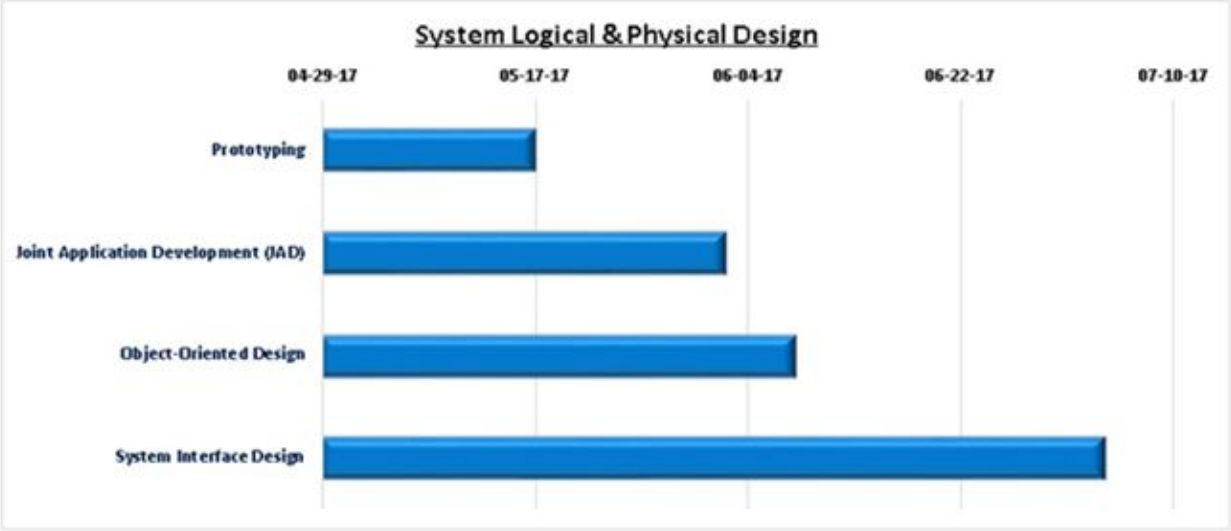


Figure 3

Deliverable 4 Gantt chart

Figure 4 below shows the Gantt chart for the system construction and testing that forms part of deliverable 3.

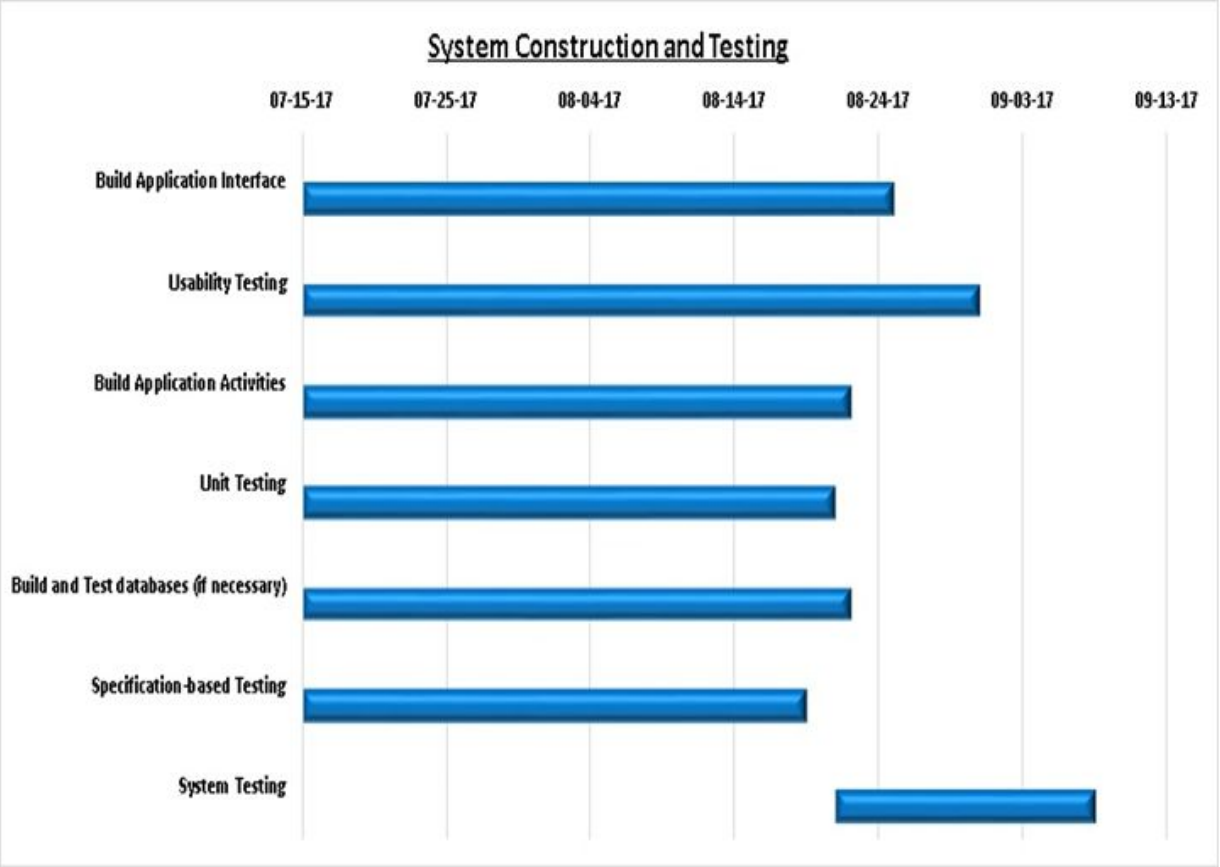


Figure 4

Deliverable 5 Gantt chart (User Manual)

Figure 5 shows the Gantt chart for the user Manual that forms part of deliverable 5.

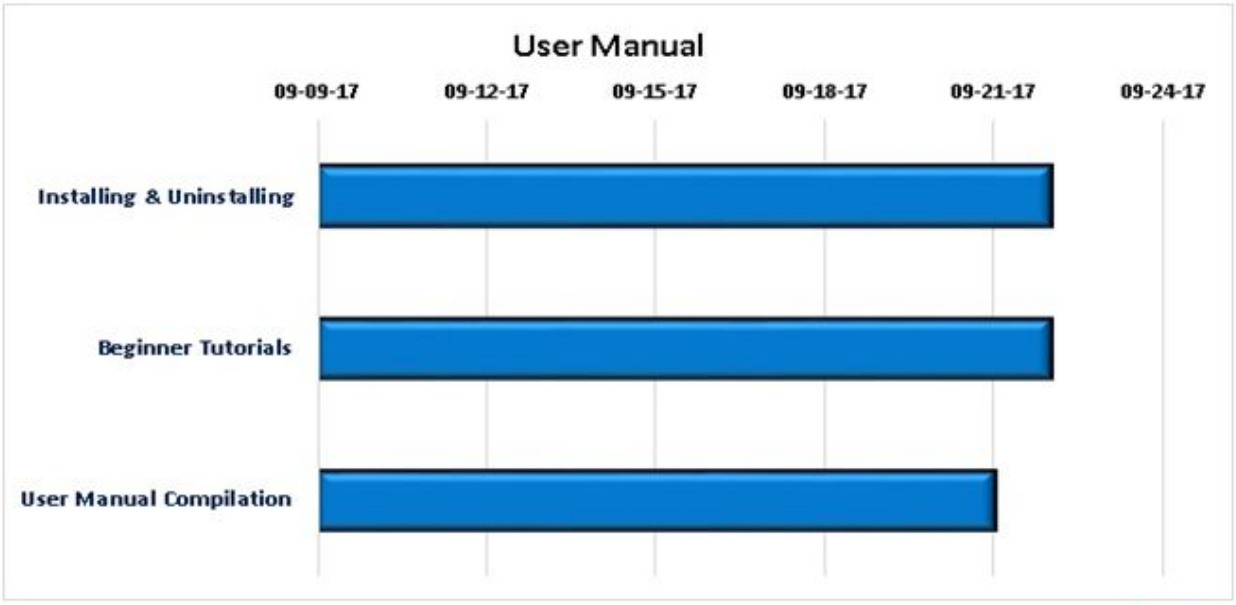


Figure 5

Deliverable 5 Gantt chart (Evaluation Report)

Figure 6 indicates the Gantt chart for the evaluation report that forms part of deliverable 5.

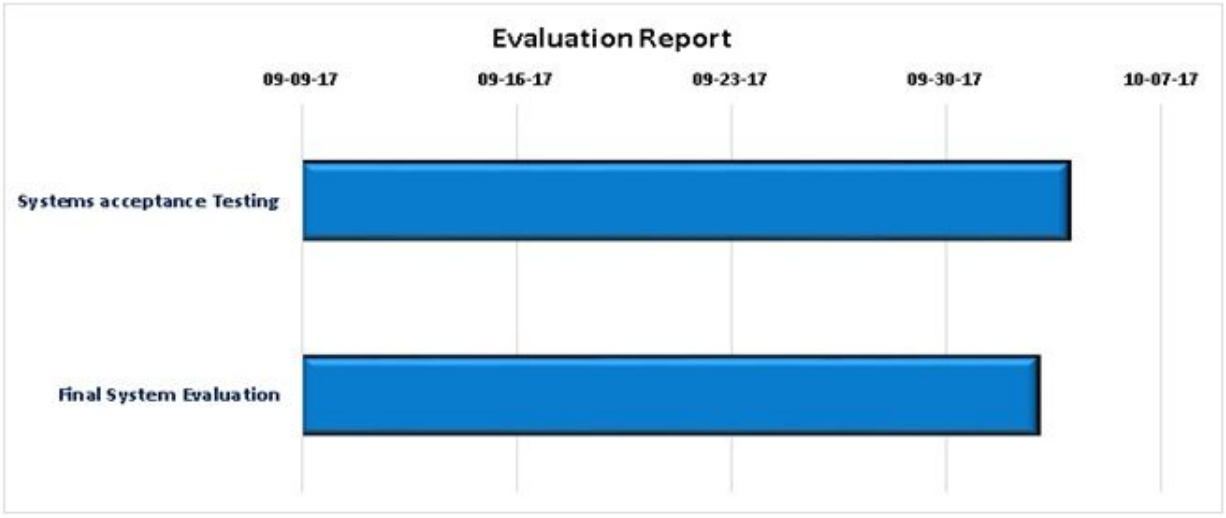


Figure 6

Deliverables Gantt chart

Figure 7 indicates the Gantt chart for the eyeRS Project Deliverables.

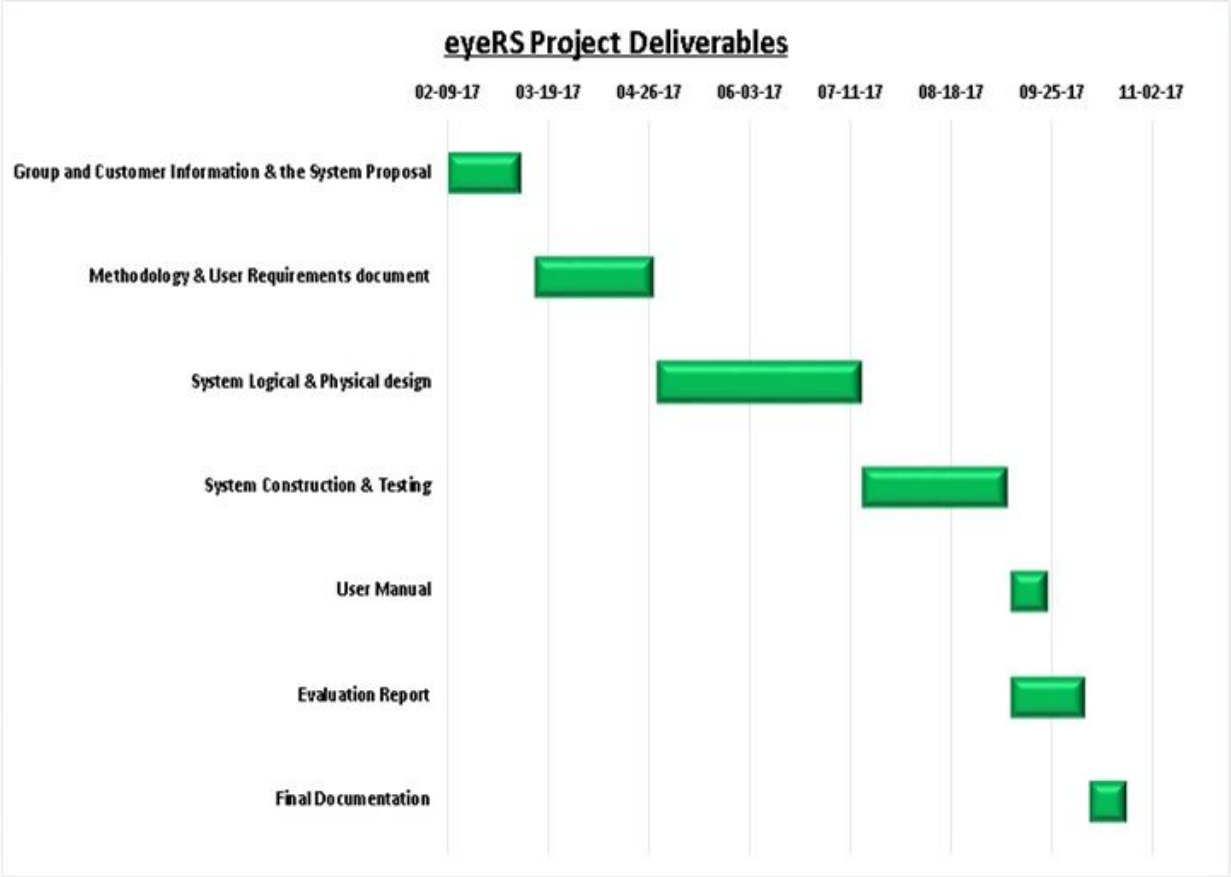
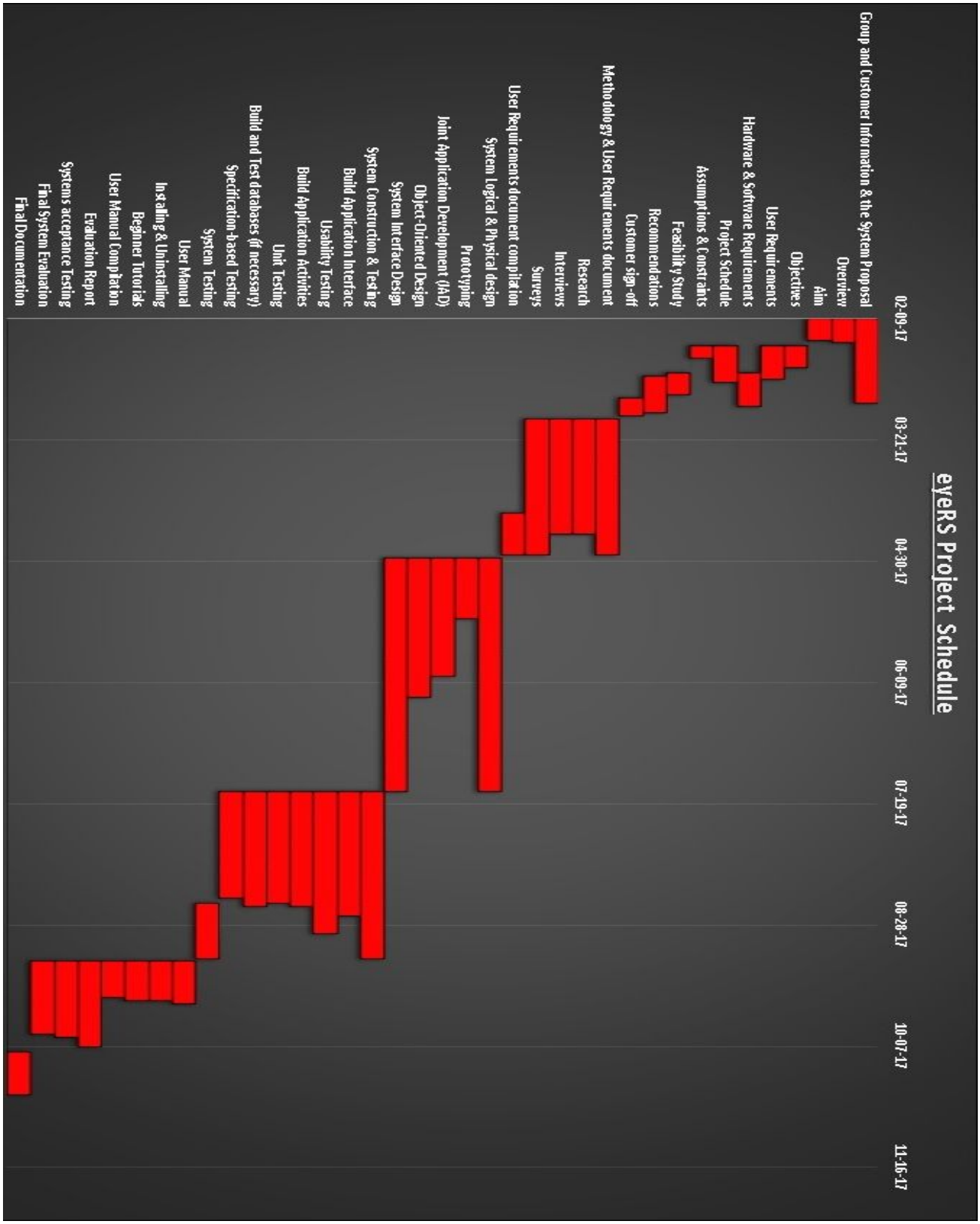


Figure 7

Full Detailed Gantt chart



2.7. Assumptions & Constraints

Scope

Assumption

The eyeRS mobile application will consist of an inventory for household items. The user is able to upload these items onto the application via the built in camera or a local file source such as the gallery. A bid or buy system will be implemented for users who wish to sell any unwanted items. All inventory that will be put up for sale will be available to all users that have downloaded the mobile application. Contact information will be made available for the interested party. Personal inventory can be shared amongst other users via WhatsApp or bluetooth capabilities.

Constraint

Limited skills and time consumptions will lead to a very limited scope for the eyeRS application (Buttrick, 2013). Support for social media login would have been an added benefit if implemented, however due to the limited time, this requirement may not be met. An in app chat system would be convenient for the purposes of providing a online means for users to offer trade/sale of their items with other users. Due to the limited experience of the development team with the required task, this requirement may not be met.

Linking the application an external database to store the data would be less proficient than making use of the built in android database. It would, however, be beneficial in terms of sharing information pertaining to the database. This requirement cannot be met as the development team will not be able to meet the budget requirements to implement this solution. Once the scope of the project has been defined, there will be no room to add further features and requirements to the project (scope/feature creep). Failure to manage this can result in the development team failing to meet all the requirements (Buttrick, 2013).

Time

Assumption

The project schedule will have a fixed deadline. The Deliverables for the project are all time-constrained, therefore the client will need to sign-off each deliverable by the set deadline in order to ensure that the project remains on schedule. Certain deliverables will be completed in less time due to their scope. This will afford the team more time for the other deliverables. Other deliverables may require more time than others to be completed. Good time management is therefore vital in order to delegate the extra time acquired from early completion to the deliverables with a larger scope. The success of the project will also be measured on whether it is completed and delivered on time (Buttrick, 2013).

Constraint

Preparing for unforeseen circumstances should be done during the planning phase due to the limited availability of time to deliver the application. Although one cannot always predict the outcomes for every situation. For example team member becomes ill and can no longer participate in the project indefinitely. A contingency plan would have need to be set in place. The initial set deadline, may not be met as a result. There is no leeway to be given in terms of the schedule being changed to push back the deadline if any of the deliverables are not completed on time.

The deadlines for each Deliverable are as follows:

- Deliverable 1: 17/03/2017;
- Deliverable 2: 12/05/2017;
- Deliverable 3: 11/08/2017;
- Deliverable 4: 15/08/2017;
- Deliverable 5: 13/10/2017;
- Deliverable 6: 27/10/2017; and
- Release date: 03/11/2017.

The project Deliverables all have deadlines in which the customer is to sign-off and approve. Failure to meet any of the Deliverable deadlines will cause the project schedule to be modified. This may lead to exhaustion of the total project time required to complete the project due to the fixed time constraints.

Budget

Assumption

The budget will depend on a number of factors. Github will charge for security of the eyeRS mobile application code. The free version offers less security, however this option is sufficient for the scale of the proposed project. From planning and research which include surveys, this could become a potential expense. The budget is affected directly by the time taken to complete the project. Since spending more time on the project would require more resources and and pay for the employees. Resources are the biggest factor in the budget for any project.

Constraint

Due to a limited budget, the project team may need to trim down some of the project work if it leads to the budget getting overrun (Buttrick, 2013). The nature of the tools being used to develop the system will be available for free use. No further costs are to be incurred in terms of outsourcing from any third-party software companies as this would simply overrun the budget (Buttrick, 2013). The costs incurred by the project team should fall within the allocated budget. Most of the resources and facilities required to successfully come up with a fully functional mobile application have already been accounted for (Buttrick, 2013).

Risk tolerance

Assumption

A system would need to be put into place to accommodate for any unforeseen employee turnover or retirement. In the case that a team member should remain absent indefinitely a replacement would be required to increase productivity. In doing so this could indirectly affect the budget in terms that we would need to search externally for a replacement. Another case would be if the budget runs out. Proper planning would need to be carried out to avoid this from happening. Proper planning and research will need to be done in order to run a successful project. That is the only way to avoid having to go back to any previous phases in the waterfall model. If proper planning and implementation is done, that will minimise any problems in the future if not eliminate them completely.

Constraint

It is vital for the customer to accept the risks that may be encountered within the project from the initial stage of the application development phase. Project risks will directly impact the project Deliverables and these need to be managed and resolved with a high priority to avoid making the project unfeasible (Buttrick, 2013).

For High risks, the project team will need to attempt to prevent and avoid that risk from occurring. The contingency plan will automatically be put into action should a risk classified as High, occur (Buttrick, 2013). For Medium risks, the project team may need to consider transfer measures and the contingency plan may need to be implemented (Buttrick, 2013). For Low risks, the project team may need to simply monitor the risks incase they escalate and become more severe over time (Buttrick, 2013).

Resources

Assumption

In order for any project to become successful, resource management and allocation will need to handled efficiently. The resources that will be available would need to be identified as early as possible from the resources that are readily available to those that need to be obtained at a later stage. Resources that are available would be the people that will partake in the project which are the team members. In this instance 5 members. Each member of the team has a field of knowledge that will be beneficial for the progress and completion of the project (Schwindt 2006). Other resources such as tools and equipment that is required are the computer's (hardware) that are needed for the development of the application. Programmes (software) are also required in the development of the application should include Android libraries and development kits as well as an Integrated Development Environment (IDE) in which to do the actual development work.

Constraint

Problems may arise if there is a lack of resources required in order to carry out the project tasks required for each Deliverable (Buttrick, 2013). This could refer to the computer-aided software tools required to develop the application prototype, user interface or the application itself. In order to ensure the project is completed up to the required scope level, certain resources need to be made available at all costs (Buttrick, 2013). Some of these resources may include:

- Sufficient manpower to undertake each project Deliverable;
- Facilities to enable the project team to work effectively; and
- The project tools and systems are relevant and compatible with the project team's workstations.

There is not a large constraint on the resources available for the project team as there is access to various open source freeware available for download on the internet in order to successfully complete the project Deliverables (Riddle & Fairley, 2012).

Quality requirements

Assumption

The quality of the system will be of a great standard since a detailed scope is understood by all the members of the system development team. The project will also have a high quality standard because of the time that has been divided into efficient deadlines that will be executed. The quality of the system will be of a high standard since cost efficient planning were conducted.

Constraint

The quality of the system might be affected by the availability of time. The time given to the system developers might be abused which will lead to a shortage of time, which will then result in a decrease in quality. Ways in which the time might be abused is poor planning, unexpected setbacks, a loss in one of the development team members, insufficient contribution from members in the development team or any other cause that might take up time that was not planned for (Haughey, 2011).

Since time is money it will also lead to an increase in the cost of the development of the system. The increased cost will lead to a decrease of quality since the system development project has a fixed budget and the extra cost for the time exceeded will be deducted from other areas in the budget planning (Haughey, 2011).

The use of more resources may have a positive influence on the overall system but it might have a negative effect on the cost of the system development project budget and also on the time spend on the project. It might also influence the system in negative manner. The quality of the system might also be affected when the scope of the system changes. These changes will also influence the time, cost and resources used in the development of the application.

2.8. Feasibility Study

The feasibility study below will compare the proposed eyeRS mobile application against two pre-existing similar programs, namely:

- Closet+ (http://closetapp.com); and
- ONSIGHT (https://www.onsightapp.com/mobile-product-catalogue-app).

Both pre-existing applications are complete systems that have been published and are still in use.

Closet+ is a automated style assitant developed for Apple's iPhone that is designed to aid users in organising, cataloging and planning their wardrobes developed by MY/STATIC/SELF (MY/STATIC/SELF, 2017).

Onsight is a mobile catalog application designed for wholesalers, manufacturers and distributors to replace their paper catalogues (Onsight, 2016). Onsight's website (2016) indicates that they supports various mobile platforms, including: Android devices, Windows tablets and Apple iPads. The app's main purpose is for the salesmen to be able to show potential clients with descriptions and images about a desired product.

Operational Feasibility

A operational feasibility study involves an evaluation to determine how well a system has been proposed and whether its proposed operations are feasible, as well as how the system takes advantage of available market opportunities and satisfies the user's needs (Valacich et al., 2015; Katimuneetorn, 2008).

	Closet+	**ONSIGHT**
Performanc e	According reviews posted to the Apple App store about Closet+ is plagued with bugs and other glitches.	It performs very well according to their scope in which is an virtual advertising company based on pictures. It requires internet to work, affecting your battery life and costs (Onsight, 2016).
Information	Closet+ provides users with a grid base to provide users with a gesture-driven user interface.	It is not a system that any user would know what to do at the first place. It works in par with Windows as an admin and the mobile as users or employees. It is a one-to-many situation, Admin to employees. Windows system to mobile systems.
Control	Due to the natures of data that the app stores and the encryption standards associate with the Apple iPhone there is little risk of security issues. In addition to this Closet+ has built-in tools to backup and restore user data in the event of an error .	Nowadays safety is one of the strongest talking point when developing an system, due to data storage and payments. Onsight is exposed to any threat because its nature is data storage and payments online (Onsight, 2016).
Services	Due to the number of reported bugs present in the current build of Closet+ does not provide a reliable service to the user. As the app is designed for the cataloging of clothing alone it limits users to the clothing and other accessories though the system core system can be expanded upon greatly.	Due to its magnitude Onsight provides all different user guides in case of any uncertainty. Its' expansion depends on user's budget; package offers different features.

The implementation of the system will achieve the objectives set in the proposal's objectives. As indicated by the existence of other similar systems it is feasible to construct from an operational point of view. Ultimately, if the application is constructed and implemented correctly, the need outlined in this proposal can be met.

Technical Feasibility

A technical feasibility study is a process of analysing the logical aspect of a business operation to determine whether the organisation has the ability of constructing the proposed system (Valacich et al., 2015). It involves assessing the development team's ability to physically construct a proposed system.

All the required technology outlined in the hardware and software requirements currently exist and the construction of the proposed system is feasible within current technology limits. eyeRS development process will be using differents systems to maximise time efficiency as well as quick response in terms of solutions towards the final system in order to fully develop and launch the proposed system within the specified budget and schedule. There are already different systems in the market but we want to create something simple, trustworthy, friendly and affordable. We are fully capable to develop such system and succeed in different phases of the project development. Our team is equipped with different skillsets and roles during the application's development.

Ultimately it is feasible to construct the system from a technological standpoint. All software required to develop the system already exists and no new hardware components need to be produced to support to the proposed system. The development team can be trained in the usage of the new technology and thus the development of the project does not need to be outsourced. The eyeRS development team has the ability to develop the proposed system.

Economic Feasibility

According to Valacich et al. (2015) an economic feasibility study is a process of determining whether the cost and financial benefits associated with developing a project are reasonable. The development team is well versed in the use of all software required and thus no external training is required and the the creation of the project will not need to be outsourced.

Closet+ has a free version with limited features available for download with a full version available for $2.99 (MY/STATIC/SELF, 2009). As Closet+ is free, a sales model where limited features are available for the free build of the software, it does not offer all the resources available until it has been purchased.

As any system in the market whose aim is to make profit and help people, they always offer the trial version for less than 30 days. This version comes with basic functionality. It is not a cheap system to buy it currently vary from R157+VAT to R5226+VAT per month depending on the package the user selects (Onsight, 2016).

The creation of the project is justified and it can be completed within the current cost and time constraints. The existing technology is cost effective. Once the project has been published there should be no additional maintenance costs. The benefits of developing the system rather than outsourcing the development of the system ultimately outweighs the potential costs of developing the project.

Schedule Feasibility

Considering the time given and guidance from the gantt chart, our group will be able to achieve the different objectives in the system development. Our group is highly skilled in different sectors in the system development, which brings efficiency as well as a quick pace to the system development.

Closet+ is an application that has been in the market since the 14th April 2009; This was the launch of version 1.0 of the app. Different versions were created to improve the application as well as change the name of the application. From the 23rd of October 2009 to 31st of August 2010 the application was updated several times with different versions, from 1.3 through to 1.4.2 version where bugs were fixed and additional functionality to the app was added.

The application in continuously changing due to bugs, changes in the user's necessities and platform updates. Various versions have been launched in order to satisfy the user's needs and wants and improve the overall quality of service provided. On the December 12th of 2013 the application started to be called "Closet+" from closet 1.x; changes were made as the icon and updated design for iOS 7. The last update was made on the 2nd November 2015 where the developer updated the application to allow usability on the latest iPhone model (MY/STATIC/SELF, 2017).

2.9. Recommendations

In-house development has been recommended to the customer as it is ideally suited for the development of project. Communication within the development team is vital to the success of the project and would ultimately improve the overall productivity of the team as a whole. In-house development with a small team would facilitate this level communication.

If any team member is unable to contribute to the development of the project, a replacement would need to be found. Though this may affect the moral of the team it may be needed to make up for the loss of manpower. However, it all comes down to the budget and time prescribed initially.

The development of the project does not have to be outsourced as the team can be trained in the usage of the new technology and all tools that will be required for the development of the project. Ultimately, is-house development has been recommended as its benefits outway its costs.

3. Customer Sign-Off

Customer Name & Surname	Customer Signature
Group Leader Name & Surname	Group Leader Name & Surname

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