Refactoring and Evaluating an Early Childhood Development Resource Management Platform

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ABSTRACT

You and Your Baby is a platform that facilitates the proliferation of content that supports Early Childhood Development(ECD). The platform was created in collaboration with the Bhabhisana Baby Project (BBP), a Western Cape based NGO whose focus is the early development of children between the ages of 0 and 2. The platform allows parents and caregivers to access posters and content that supports ECD. The platform consists of a web portal where BBP staff can assign content to parents and caregivers who can access it through a mobile android application or a web site. The platform, having been deployed in early 2023, has launched with a number of issues that limit its architecture and performance. This project aims to refactor the entire platform to address these issues as well as investigate and evaluate whether the platform is a success based on the findings of community engagements with Bhabhisana staff as well as users of the platform. The project will design a new backed architecture for the platform to make it more portable and deployable, refactor the mobile application and web application to make them more usable and bandwidth-constraint friendly, and explore the best metrics by which to evaluate the performance, success, and community engagement with the platform.

CCS CONCEPTS

• **Human-Centered-Computing**; • **Human Computer Interaction** → *HCI design and evaluation methods*; • **Software and its engineering** → Software creation and management; • **Networks** → Network services;

KEYWORDS

HCI,evaluation, mobile development, web development, architecture

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1 PROJECT DESCRIPTION

You and Your Baby is a platform designed to facilitate the dissemination of Early Childhood Development (ECD) resources for the Bhabhisana Baby Project. Early Childhood Development describes the critical physical and mental development stage that children undergo between the ages of 1 to 3. There is a critical lack of ECD support for parents of young children in under-resourced and bandwidth constrained communities in South Africa[1]. A lack of ECD support and resources can have negative impacts on a young child's psychological development in the early formative years which may have repercussions on that child's upbringing in the future [1]. You and Your Baby aims to address this shortcoming by creating a content management platform that allows ECD resources to be shared with parents and caregivers. These resources range from infographics, to PDFs, to image and video content. These resources can be accessed through a web application or through a mobile application. There is also a web portal that allows content administrators to manage the upload of content as well ass the assignment of content to specific users.

The project aims to refactor an existing ECD platform to make it portable and compatible with the needs of bandwidth constrained communities. This involves users being able to download specific videos, articles or images to their phone in order to accomodate bandwith constraints as a study in township settings in South Africa has shown that most individuals use mobile data to update and download rather than to stream videos as streaming videos use too much bandwidth[4]. The platform should be able to seamlessly integrate as a service with the iNethi community wireless network whilst still being accessible on the internet. The project will redesign the back-end of the platform to be completely generalised so that all ECD content available can be accessed by any future applications that may need it. The project will explore alternatives to Wordpress or potential modifications to the Wordpress portal that will address the issues of portability and security. The project will refactor the mobile application to include additional functionality as well as support for the collection of usage data. The project will aim to address the question of "what qualifies as a successful platform in the wake of a co-design process?"

2 BACKGROUND

How the first 1000 days of a child's life progress plays a critical role in how the future life of that child will unfold [8]. Members of low-income communities often do not have access to or knowledge of quality healthcare resources [10] [11]. This impacts the health of both the child and the their caregiver. A study conducted by Meintjies and Belkum [11], noted that most caregivers in their

participant group did not have sufficient knowledge in the different development areas of a child which included fine motor and visual skills, cognitive skills, language and speech and social and emotional development. Without sufficient knowledge on how to care for a child, caregivers run the risk of negatively affecting the progression of the first 1000 days of the child's life.

After birth, many mothers face the risk of experiencing anxiety and depression which negatively affects their own and their child's well-being [12]. Mothers are also at risk of experiencing social exclusion and social isolation which is a major factor leading to maternal depression [5].

The Bhabhisana Baby Project is an organisation based in the Western Cape which aims to assist and support parents from low-income backgrounds with children who have developmental issues. In 2022, they collaborated with with three UCT Honours students to co-design You and Your Baby. The aim of the application was to aid in supporting caregivers raise their babies by providing them with content that would educate them on the various topics relating to ECD [3][15][16].

3 RELATED WORK

To address the shortcomings of inadequate maternal and child health (MCH) in low-income communities, researchers have turned to digital interventions to support MCH. Digital interventions for MCH such as MomConnect and WhatsApp allow people to access MCH digital resources and support without having to physically or financially be able to access health services such as doctors and clinics. According to a research study done by Muthelo et al [13], the participants reported that they found digital support applications addressing MCH to be a helpful in various ways, such as it improving communications on MCH with participants, but that they also faced barriers accessing them. Such barriers included poor area network connectivity, the high cost of data and a lack of cellular devices to access the digital resources.

Community Wireless Networks (CWNs), such as iNethi, aim to address the issue of low-resource communities having poor telecommunication and network infrastructure and access. iNethi is a community-owned CWN that allows community members to access services hosted in its servers at no data cost and allows users to access the internet at a lower rate than using a traditional network service provider [9]. Many researchers have turned to CWNs as a viable solution to addressing the telecommunication disparities between urban and rural areas[6]. Although much research exists to suggest that mobile applications would be an effective solution to MCH issues, there have not been many attempts at developing applications to teach parents of young children about their children's health. A mobile application for teaching mothers about their child's oral hygiene was found to improve the mothers' knowledge of their children's oral hygiene needs [18]. However, a gap exists in the research and development of mobile applications specifically surrounding ECD education for parents. The most popular exmaple is ECDmobi, a mobile application developed by the Department of Basic Education (DBE) and UNICEF South Africa. This application seeks to assist parents of children under four years old through informative articles and activities. This application does not, however, focus specifically on parents of children with developmental disabilities or have many features to support bandwidth-constrained communities [17].

4 PROBLEM STATEMENT

4.1 Motivation

The You and Your baby platform having already been deployed in Sweetwaters (KZN) and Ga-Dikgale (Limpopo) and has revealed a number of problems with the system and its architecture. These problems include:

- The web portal is built on Wordpress and is too difficult to port and deploy in different contexts.
- API calls to the Wordpress portal return 'dirty' JSON files from which it is difficult to extract data.
- The back-end is not generalised and cannot be seamlessly integrated into the architecture of a different system
- The system is insecure and does not support thorough authentication. The results of API calls can be displayed without authentication.
- There is no support for the collection of usage data.
- There is no support for downloading video content from a server onto the device.

4.2 Aims

The aim of this project is to implement improvements to the architecture of the You and Your Baby system based on an assessment of the system's initial deployment for use by the caregivers and researchers associated with the Bhabhisana Baby Project in March 2023. Additionally, this project will conduct in-depth user testing to assess the platform's usability and implement methods to increase usability of the platform through the addition of new features. This project will also investigate whether the co-designed nature of this application has resulted in an application that community members find usable. In this regard, usage tracking through the use of analytics will be important in assessing the application's usage.

4.2.1 Web application and Web Portal.

- Investigate the problem that the current WordPress implementation poses during deployment and when integrating the application into other systems such as the iNethi wireless network
- Making revisions necessary to allow system to be integrated with other systems such as the iNethi wireless network
- Improve security of the system by implementing improved authentication and limiting API access

4.2.2 Mobile Application.

- Refactoring the existing You and Your Baby mobile application to include cater to an expanded set of user requirements as realised through community engagement
- Include support for the platform's new back-end API
- Include usage data recording at key usage points in the application

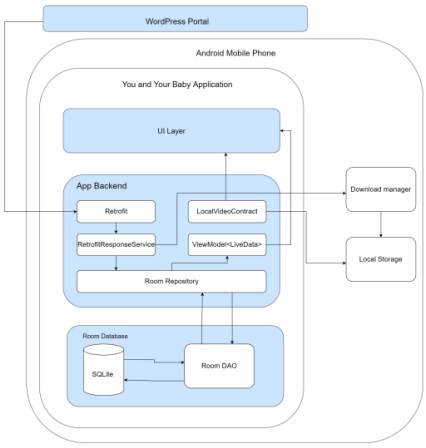

Figure 1: Current architecture of You and Your Baby Application

- Enable download of videos and content directly from the database or from the web portal depending on which is more bandwidth efficient
- Support download of ECD content onto the local device to accommodate for bandwidth constraints

4.2.3 *Web API.*

- Create an API that returns a 'clean' JSON file containing only the necessary information

4.2.4 *Database Design.*

- Store all ECD content in the same database
- Connect database to the mobile application
- Allow mobile application to upload directly into the database

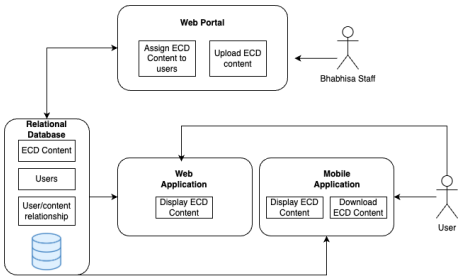

Figure 2: Proposed architecture of You and Your Baby Platform

4.2.5 *Architecture.*

- Investigate what overall architecture best supports the needs of the Bhabhisana Baby Project's You and Your Baby Platform
- Investigate the best way to refactor the overall architecture of the system to be easily portable and usable in different contexts
- Store content completely separately from web portal and web and mobile applications

4.3 Research Questions

This project also aims to investigate the usability of the You and Your Baby application as a product of the co-design process started between the Bhabhisana Baby Project and University of Cape Town researchers Coleman et al. and 2022 Honours students. This will require the facilitation of workshops with Bhabhisana staff, You and Your Baby application users and individuals from communities where You and Your Baby has been deployed who do not use the application.

4.3.1 *Evaluation.*

- Semi-structured interviews with Bhabhisana staff who have been using the web portal to upload and assign content to caregivers
- Semi-structured interviews with caregivers associated with Bhabhisana who have been using the application to access ECD content
- Usage data from the WordPress web portal will be monitored and analysed to provide insights into the extent to which the web portal has helped the staff complete their activities

5 ETHICAL, PROFESSIONAL,LEGAL

5.1 Research in Sensitive Contexts

The evaluation and usability testing of the You and Your Baby application and its iterations will need to be done through community engagements in Sweetwaters, Oceanview and Ga-Dikgale. This research will need to include both caregivers who do currently use the application to access content and those who do not, meaning that strict ethical guidelines will need to be followed in order to ensure that risk to the participants are mitigated. These community engagement initiatives are necessary to gain the necessary user insight into the usability of the system that will be used within the development process. All research conducted will be conducted with care and respect for the participants. Participants will be informed about the researchers, their backgrounds, the project and what their involvement in the project will entail, as well as what the outcomes of their participation will be. The voluntary nature of their involvement will be stressed and it will be made clear that they will be able to leave the study at any time. Participants will complete a signed consent form and the researchers will also obtain verbal consent.

5.2 Ethical Clearance

Due to the need for us to conduct interviews and workshops with community members, ethical clearance from the University of Cape Town's Faculty of Science research ethics committee is required prior to any user evaluation or testing. These community engagement initiatives are necessary to gain the necessary user insight into the usability of the system that will be used within the development process. In order to ensure that participants are satisfactorily.

5.3 Data and Code Ownership

This project is part of a co-design initiative involving the University of Cape Town and the Bhabhisana Baby Project. The resulting project will be open source to allow other developers to expand the

project and all intellectual property belongs to the University of Cape Town and the Bhabhisana Baby Project.

6 PROCEDURES AND METHODS

A participatory approach will be followed and community engagements will be held through workshops to monitor the performance of the deployment. These workshops will ensure that the users are fully involved in the development of the platform, with any considerations arising from the workshops being taken into account for the next iteration.

6.1 Scrum methodology

A scrum agile methodology will be followed in order to ensure consistent progress and division of the work between researchers. This is to ensure that, where we have dependencies between projects, we will be able to work together and have work completed by the time the next team member needs it. Where and when there are no dependencies, the scrum methodology will ensure that we are accountable to completing our tasks. A scrum methodology will also allow iterative development and improvement of the application. The elected Scrum Master for each scrum is Rinya Singh who will be responsible for establishing and facilitating scrum. The elected Product Owners are Lwazi Sibeko and Tariro Banganayi, who will be in charge of ensuring the product backlog items are managed and communicated. The platforms which will be used to communicate, store and share data for the group are Teamgantt, WhatsApp, Discord, Notion, Google Drive and Microsoft Teams. The entire project will be split into sprints of 7 days each. Each sprint will begin on a Friday, where we will meet in the UCT Computer Science Honours lab or on Microsoft Teams at 10:00. During this meeting, the sprint planning will take place until 12:00. The result of this sprint planning meeting will be a sprint backlog, where we will have defined sprint tasks for each member to complete. Thereafter, on each day at 10:00 we will have a daily scrum meeting on either by WhatsApp voice call or chat to update each other on our progress. On Thursdays, at the end of each sprint, we will conduct sprint reviews and sprint retrospectives in the UCT Computer Science Honours lab or on Microsoft Teams at 10:00. The sprint review will take place during 10:00 to 11:00 and this is when we will be assessing each others progress during the sprint and overall project progress. The sprint retrospective will take place from 11:00 to 12:00 and this is when we will be assessing the way in which we conduct the weekly scrums and make changes to it if need be.

At the beginning of the project, the current You and Your Baby platform architecture will be analysed in order to completely identify the problems with the current system and weigh alternative approaches into ways that these problems can be solved. After identifying and devising a list of tasks that need to be completed in order approach the project, a product backlog will be created. This product backlog will be complete by the 3rd of May 2023.

6.2 Testing & Evaluation

6.2.1 Mobile Application and Web Portal Evaluation. Due to resource and time constraints, discount usability techniques will be used to conduct evaluations of the web and mobile applications as an effective method of gaining insights into user experience [14]. First, heuristic evaluations will be conducted with expert participants from the UCT HCI lab and the users of the currently-deployed application from the BBP. These participants will include the caregivers who have been exposed to the current deployment of the You and Your Baby application. Given that we will attempt to involve current users of the application, we might not be able to acquire a representative sample of all caregivers in terms of demographics. The heuristic evaluation will be conducted using Jakob Nielsen's 10 Usability Heuristics[7] as a guideline by which the experts and end-users will evaluate the web portal and mobile application. This evaluation will take place through semi-structured interviews that allow the users and experts to provide in-depth insights into their opinions on the application while still allowing the researchers to keep the interview on topic.

Similar methods will be used to conduct heuristic evaluation for the current web portal with experts and BBP staff. These evaluations will be conducted with the BBP staff at their offices in Athlone in the second week of May as the insights provided through this evaluation will be integral in the design of the new web portal to ensure that any usability issues with the current web portal do not get carried over to the new iteration.

Once the new iterations of the mobile application and web portal have been deployed, these heuristic evaluations with experts, BBP staff and caregivers will be repeated.

6.2.2 User Studies. User studies will be necessary to investigate whether or not the application, given that it was built using co-design, has proven to be useful to the users. These user studies will consists of contextual inquiries with Bhabhisana staff to investigate their usage of the web portal as well as contextual inquiries with You and Your Baby users to evaluate their usage of the application. Workshops will be conducted with users of the platform to investigate requirements, needs and wants, and usefulness. We plan for two main workshops to take place for this project.

The first workshop will take place with participants from the Bhabhisana Baby Project (BBP) to continue the existing relationship with the organisation. However, the subsequent session with the wider communities of Ocean View will control for this lack of representation with a more diverse set of participants. This initial workshop will involve usability testing through a Wizard of Oz study with all three researchers in order to develop an understanding of the current application's usability issues, any further requirements and additional functionality that the community needs. The second day of this workshop will consist of short interviews, brainstorming sessions or prototying with participant involvement- depending on the usability issues that arise during the first Wizard of Oz study. This ensures this iteration of the application to continue with the co-design methodology previously followed in engagements with the You and Your Baby application as this is integral to improving the complex societal problem of caregivers' knowledge about ECD [2].

This workshop will be held roughly over two days in the week of the 22nd of May as we plan to allow flexibility to accommodate for the caregivers' schedules, with the staff being given full consent

information and their voluntariness will be stressed.

The second workshop will take place after the deployment of the You and Your Baby application and web portal onto the iNethi servers to provide insight into the extent of the deployment's success in the communities of Ocean View. Participants for these workshops will be recruited for a workshop in the third week of July. We will attempt to recruit a representative sample of Ocean View community members who are either parents or caregivers (regardless of age, gender or race) who would be likely to use the application to access ECD content. These participants will be recruited through the existing relationship with the director of Black Equations and will be informed fully about the workshop, their ability to leave whenever they wish. Signed consent forms will be acquired.

The first day will focus on training and exposure of the participants to the You and Your Baby instance that has been deployed on the community's iNethi server. This will involve researchers introducing the participants to the application and getting their thoughts on the deployment of the service.

The second day will consist of a heuristic evaluation of the application in a similar fashion to that described in the section Testing and Evaluation. This heuristic evaluation will provide interesting nuance into how a different community will react to an application that was co-designed with the BBP and whether or not this co-designed application will have the same usability issues in different communities. Another method of evaluation that will be used is that of the cognitive walk-through. The participants will be asked to complete a set of common activities and will be observed as they attempt to complete the activities without help or prompting by the researchers. These activities will simulate everyday usage of the application and will expose the usability issues that may arise during normal use of the application. The workshop will conclude with short, semi-structured interviews with participants to elicit any requirements that have not been recorded during the rest of the workshop.

6.3 Mobile Development

The You and Your Baby application will be developed using Kotlin in Android Studio. The application will be developed using agile development methods and will follow a design cycle that includes requirements specification, development, testing, deployment, and review. At the time of download, the user will have access to ECD content in the form of PDFs and images that come bundled with the application. Users will also be able to view all video content available on the platform as well as video content that has been specifically assigned to them. Users will be able to select which video content they would like to download to their device. The application will pull this video content from the web application which in turn pulls content from the database. The mobile application will also introduce the recording of usage data and analytics to allow developers to track and review usage within the application.

6.4 Web Development

The web portal content management system will be refactored. This web portal will allow users and administrators to upload content and administrators will be able to manage and assign content to specific users. The approach to be taken with the redevelopment of the content management system is an API driven content management system. This will ensure scalability and omnichannel content distribution.

The web application will also be refactored. The web application is to allow users an alternative way of accessing You and Your Baby content without having to download an application onto their device, therefore saving them storage. Although the web application is to be deployed onto the iNethi server, because of the generic architecture of the refactored web application, it will be available to be used and hosted in different contexts.

After the successful development of the web application, it will be integrated with the new web API that is also being developed. The web application will be tested for compatibility with iNethi using a virtual machine developed for testing the compatibility of potential new services to be deployed onto iNethi [iNethi paper]. Thereafter, the web application will be placed in a Docker container to be deployed in the iNethi architecture for the Oceanview communities.

6.5 API Development

An API will be developed to facilitate the download of content onto mobile applications without the current issues of insecure data loss that were WordPress related in the first iteration of the system.

6.6 Database Design

The existing database on which content is stored will undergo a redesign to allow all forms of content to be accessed in a non-discriminatory manner. This will allow videos, images, and PDF documents to be accessed the same way with a single API where different API endpoints will be used to access different types of content.

6.6.1 Unit Test. Local unit tests will be developed for and conducted at the end of every sprint to test the behaviour of the resulting software products. This is to ensure that each unit of code created works as it should to prevent future problems.

6.6.2 Integration Testing. The database, web application, and mobile application exists in a hierarchical structure with the web and mobile applications pulling content off of the database and the web portal used to manipulate content in the database. As a result the database will be designed first but the web application and the mobile application will be developed in parallel. A stub is a dummy program that acts as a substitute for any missing modules - this will be set up to test the APIs and the mobile application will use the stub during the development cycle. A top-down integration testing model will be used to test the integration on the web application and mobile application at the most general level and work down to the smallest modules.

7 ANTICIPATED OUTCOMES

7.1 System

7.1.1 Software. The new system will, firstly, include a custom-designed website that functions as a web portal and content management system where administrators can upload, manage and assign content to the users of the You and Your Baby. The key difference between the old platform and the new platform is that no content will be hosted on the web portal. The web portal will instead only be used to manage relationships between users and content. The content and the users will all be entries in the relational database and can be accessed from the web app or mobile app via queries to the database. This web portal will need to have an architecture that is compatible with the iNethi Community Wireless Network. The system will also include an improved version of the Android application that includes new features- users should be able to download articles or videos to their local device. Additional features will be explored to improve the usefulness of the platform after it has been tested and presented to community members.

7.1.2 Expected Impact. The re-designed architecture of the You and Your Baby mobile application will allow individual users to exercise more control over which specific pieces of content they download, as well as allowing the application to be deployed on the iNethi CWN. This deployment of the You and Your Baby content onto the iNethi network will allow the members of the bandwidth-constrained communities where iNethi has been deployed to access the important ECD content available on the You and Your Baby application. A refactored CMS will be more portable and easier to maintain by future developers. The new overall architecture of the platform will create an application that is easily deployable in different context as it generalises the back-end functions of the database and hosts the content completely independently of the web portal. This means that a 'plug and play' model can be used to customise front-end modules should a different community or NGO want access to the ECD resources. The development of metrics by which the adoption of this technology can be quantified will also add nuance to the field of technology acceptance theories. This will be done through community engagement and workshops to find the identifying features of an application that is useful for its intended users.

7.1.3 Key Success Factors. In order for this project to be deemed successful, many criteria need to be met. The new web portal will be deemed successful if interviews with the Bhabhisana Baby Project administrators show that it is successful at allowing them to upload and assign content to users. This web portal, along with its API and the You and Your Baby application should also be reasonably generalisable to other organisations or use cases without requiring excessive refactoring of the code base. The Android application will need to incorporate all necessary bandwidth considerations that allow for the download of specific content in order to support usage by those in areas with poor network coverage and those with bandwidth constraints. The mobile application will also need to go through iterations to ensure that usability issues found in community workshops and issues found in heuristic evaluations are addressed. The resulting system should be user-friendly and easily navigable. Finally, the You and Your Baby application should be deployed to the iNethi network successfully to allow the community members of the communities where iNethi has been deployed access to this application.

8 PROJECT PLAN

8.1 Risk and Risk Management

Please refer to the appendix to find the Risk Management table which outlines how we will deal with risk.

8.2 Timeline

Please refer to the appendix to find the Gantt chart which outlines how we will execute the project.

8.3 Software Resources

The software resources we will need to conduct this project are:

- The iNethi server
- Tech stack: Django, Kotlin, database

8.4 Human Resources

The human resources we will need to conduct this project are:

- UCT HCI Lab expertise
- Parents and caregiver participants of the BBP and community members of Oceanview.

8.5 Deliverables

Deliverable	Due Date
Project Proposal presentations	Tue 25-April to Fri 28-April
Project Proposal	Tue 2-May
Ethics applications deadline	Fri 12-May
Project Progress Demonstration	Mon 17-July to Fri 21-July
Complete Draft of final paper	Mon 28-Aug
Project Paper Final Submission	Mon 11-Sep
Project Code Final Submission	Fri 15-Sep
Final Project Demonstration	Tue 26-Sep to Fri 29-Sep
Poster	Mon 9-Oct
Website	Mon 16-Oct
School of IT Showcase	Tue 24-Oct (TBC)

8.6 Milestones

Please refer to Appendix section 9.2

8.7 Work Allocation

8.7.1 Lwazi Sibeko.

- Development of a web portal for administrators
- Deployment of the You and Your Baby application as a service on the iNethi servers
- Development of a web application

8.7.2 Tariro Banganayi.

- Refactoring of Android application
- Development of new Android app features
  - Download assigned ECD content on demand
  - Support mobile application connection to the database
  - Introduce secure authentication to the Android application

- Evaluate Android application usability
- Redesign database to support user/content relationships

8.7.3 Rinya Singh.

- Add functionality to mobile application to allow the collection of usage data
- Run usability testing workshops for the mobile application in the Ocean View and Sweetwaters communities
- Interview Bhabhisana staff to investigate usability of web portal

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9 APPENDIX

9.1 Risk Management

Risk	Probability	Impact	Consequence	Category	Mitigation	Monitoring	Management
Team member drops out of project	Low	Medium	This would result in less well-rounded end product	Unforeseen	Regular team meetings and support. Providing each other with early mock data to allow team members to work with other components without having to frequently and directly work with each other.	Check ins during regular team meetings. Early deadline for mock data.	With the use of mock data, other team members should be able to continue their work.
Scope creep	Medium	Medium	Inability to stick to defined project scope and not meeting defined project aims.	Scope	Regular team meetings to review progress and stay on track.	Reviewing progress during team meetings.	Assessing the extent to which scope has been affected and re-evaluating defined project scope. Contact supervisor is needed.
Load Shedding and Power Outages	High	Low	Inability to work (concurrently) on codebase and development. Loss of unsaved work.	Unforeseen	Ensuring all devices have sufficient power. Ensuring that work that needs internet/network access and devices with power are done during times when there is (or should be) no load shedding. Use of version control software.	Daily and frequent saving of work.	Relying on saved work

Figure 3: Risk Management Part 1

Risk	Probability	Impact	Consequence	Category	Mitigation	Monitoring	Management
Integration issues	Medium	High	Inability to merge different system/project components and not being able to deliver full deliverable	Integration	Extensive research and conversations on integration approach and feasibility. Researching alternative approaches.	Doing early integrations to see if they work early.	Relying on the previously researched alternatives.
Lack of knowledge on software tools being used	Medium	Medium	Inability to develop system components as planned	Scope	Extensive research and training on the tools before use	Running code regularly and confirming with people who are already familiar with the system.	Training on the software tools or considering alternative approaches
Unavailability of parters	Low	High	Inability to complete user studies	Unforeseen	Schedule with partners well in advance	Bi-monthly communication with partners	Email and Google Calendar
Poor schedule management	Low	High	Not being able to stick to defined project schedule	Time	Regular team meetings to assess progress and stay on track	Check ins during regular team meetings.	Assessing the extent to which schedule has been affected and re-evaluating the defined schedule. Contacting supervisor is need be

Figure 4: Risk Management Part 2

9.2 Tasks

Task	Assignee	Start Date	End Date
Interview Bhabhisana Staff	Team	24 April	24 April
Final Project Proposal	Team	15 April	2 May
Initialise GitHub Repository	Team	28 April	5 May
Requirements Specification	Team	28 April	5 May
Sprint Cycle Begins	Team	28 April	TBA
Ethics Application	Team	21 April	12 May
Design Database	Tariro	28 April	5 May
UML Design	Tariro, Lwazi	28 April	5 May
Web Portal Develop	Lwazi	28 April	21 June
Analysis of WordPress usage data from current deployment	Rinya	28 April	5 May
Heuristic Evaluation with Bhabhisana Team	Team	8 May	12 May
Heuristic Evaluation with UCT HCI Lab	Team	8 May	12 May
Analysis of qualitative and quantitative data gathered from heuristic evaluation	Rinya	15 May	26 May
Workshop with BBP	Team	22 May	26 May
Thematic analysis	Rinya	29 May	30 May
Mobile Application Design	Tariro	28 April	21 June
Development of analytics features	Rinya	30 May	15 June
Integration Testing	Team	15 June	21 June
Workshop in Ocean View	Rinya, Lwazi	19 July	23 July
Thematic analysis	Rinya	26 July	4 August
Development of evaluation metrics	Rinya	7 August	18 August
Comparison with existing technology acceptance models	Rinya	21 August	31 August
Final Paper Hand-in	Team	1 July	11 September
Final Code Hand-in	Team	3 May	15 September
Project Poster and Website	Team	15 September	21 September

9.3 Gantt Chart

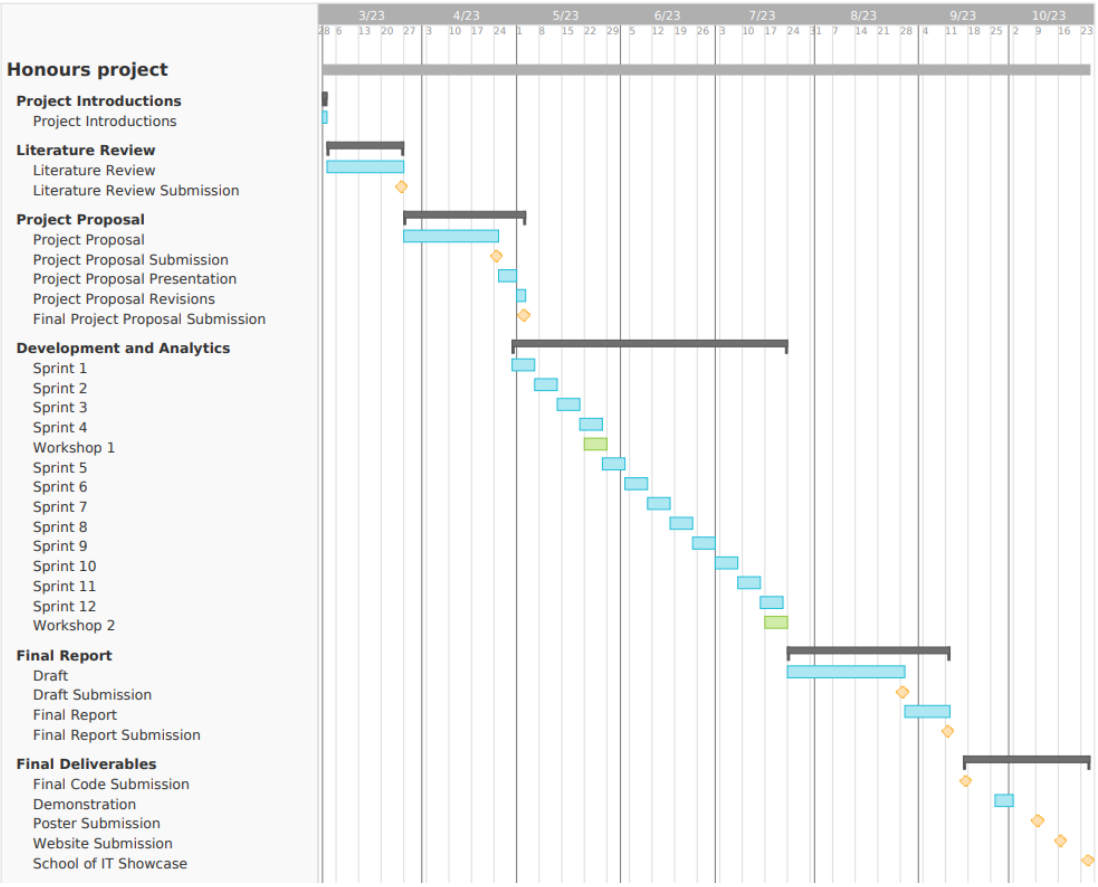

Figure 5: Project Management Gantt Chart