

ENGG3500, GROUP ASSESSMENT ITEM COVER SHEET

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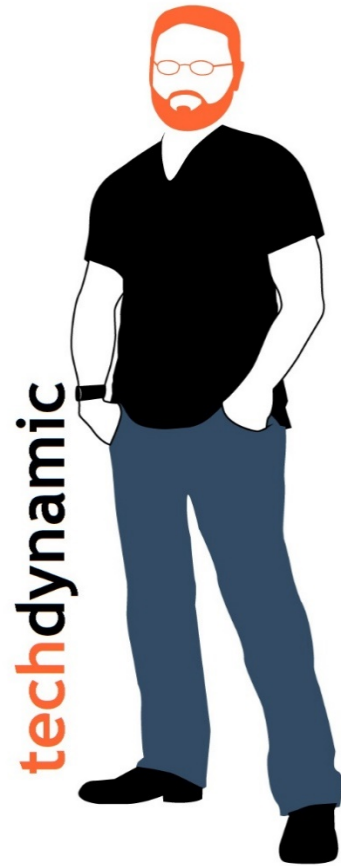
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ENGG3500 (2017), Managing Engineering Projects

Major Assessment B

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31st May 2017

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1. Introduction

This Project Management Plan (PMP) establishes the overall project requirements of the University of Newcastle Information Point (UONFO) system.

Dr Michael Netherton – representing The University of Newcastle (UON) – has recently approached TechDynamic to develop a dispersed information point for “at location” communication with students. The UONFO (U-O-N-FO) project will result in decreased queues at the Student Hubs (Shortland and Hunter), increased consistency of information across digital media, and consolidate public access information sources.

UONFO will be located at high foot traffic areas with at least one information point at each faculty location. A large (55inch) touch screen, voice capable, and with language support for international students UONFO will be accessible to all students and users.

With each information point accessing a centralised server to minimise costs and promote security, this project is scalable and easy to update; all changes are made at a single point ensuring consistency and integrity of displayed information. UONFO will support existing communication methods such as Blackboard and the Student Hubs and is not intended to replace either.

The UONFO project is predicted to be finalised February 2018. At project closure, training and user manuals will be provided with ongoing maintenance to the system at request.

2. Project Charter

2.1 Project background and business need

The University of Newcastle (UON) has developed a diverse means of communication with students through online portals (Blackboard), notice boards, digital advertisements, posters, mobile phone applications, and events; with the Student Hub centrally located for direct questions. This has often led to conflicting statements as not all services are linked or updated regularly leading to significant queues at the Student Hub.

The University of Newcastle is a leading international university attracting students from around the world. As such, effective communication is important to ensure a smooth transition for new students and consistency for ongoing. UONFO provides the foundation for a consistent platform for all students to gain centralised, up to date information without requiring university staff. Offering directions to classes (linked with a phone application), upcoming events and activities, and answering some of the most frequently asked questions in a broad range of languages, UONFO will solve many current and future communication problems at the University of Newcastle.

Ultimately, UONFO would consolidate current systems to provide consistency of information through a managed, future minded, and scalable network of devices.

2.2 Project goals / objectives

- Reduce the queue times at Student Hubs (Shortland and Hunter) by 20% after two full university semesters (26 weeks across 1 year).
- Reduce current number of communications from 6 (electronic and physical notice boards, posters, mobile applications, Blackboard, and the Student Hub) to 3 (UONFO, Blackboard, and the Student Hub) by December 2018.
- Eliminate inconsistency of information using a centralized database of information.
- Increase accessibility for international and impaired students using multi-language support with voice capable interaction.
- Reduce required travel for simple information by 80% with an information point being no further than 100m from classrooms, halls, or high pedestrian areas (Brennan room, Student Hubs, libraries, campus residences, etc).

2.3 Project scope

The scope of the UONFO project is the plan, design, prototype, and implementation of a dispersed information system which will be used by students at the University of Newcastle. Access and permissions to the system will be provided to Student Hub representatives to manage, update, or remove advertising and current event information. A database with answers to frequently asked questions and historical information will be created from surveys and feedback from stakeholders as a basis for UONFO. Campus directions will be available via on screen, exportable to phone application, and printable for contextually based directions.

The scope of this project includes all requirements gathering, planning, design, development, and implementation of the UONFO information system.

Requirements. The following high level requirements have been identified for the UONFO project to successfully integrate with existing UON systems.

- Hard drive space on a UON server.
- Database platform with access granted to administrators and Student Hub staff.
- Access to UON wireless and wired networks.
- Access to historical and course information.

Deliverables. The following table details the deliverables which will be produced as part of the UONFO project. The project will not be considered successful unless all deliverables have been met. The Project Manager is responsible for ensuring the completion of each deliverable as per the acceptance criteria.

Table 2.1 Project deliverables with description sorted by type.

Deliverables		
Deliverable	Description	Acceptance Criteria
Project Charter	A document that outlines the roles and responsibilities, objectives, stakeholders, and the project manager.	Project approval.
Requirements Analysis	A detailed document on what the software should do and should not do.	Project approval.
Scope Management Plan	A document that describes the tasks needed to complete the project.	Project approval.
Stakeholder Strategy	A plan on how to increase support of stakeholders and decrease the negative outcomes.	Project approval.
Software Model	A set of use case, class, and all other important UML diagrams showing how the system will operate.	Relevance to the requirements analysis and scope.
Software Prototype	A working prototype for the system that exhibits the major features. Minor features may be missing and dummy data may be in place.	Acceptance by the key stakeholders.
User Manual	Detailed user manual on how to use the system.	Acceptance by the key stakeholders.
Hardware	The dispersed installation of the software amongst multiple touch screen displays situated around campus.	Acceptance by the key stakeholders.
Completed Project	The finalised project after having undergone testing.	Acceptance by the key stakeholders.

Inclusions. Inclusions are the key aspects of the UONFO project that are considered essential criteria that must be met for the project to be successful. The following inclusions have been identified for the UONFO project:

- Meet all deliverables within scheduled time and budget tolerances.
- Reduce queue times at Student Hubs by 20%.
- Increase student engagement with online resources by 35%.
- Consolidate communication resources to three central sources.
- Improve consistency of information.

Exclusions. Several exclusions have been identified for the UONFO project. These exclusions will not be delivered as part of the UONFO project and any request for inclusion will require adjustment to the scope of the project. The following exclusions have been identified:

- Ongoing updates or maintenance of the UONFO system once installed.
- Any supplies or services procured by subcontractors without prior written authorization of the project manager.
- Any contract or agreement the University of Newcastle enters into with a subcontractor without prior written approval by the project manager.

Assumptions. Several assumptions have been identified for the UONFO project. All stakeholders must be mindful of these assumptions as they introduce some level of risk to the project until they're confirmed to be true. During the project planning cycle, every effort must be made to identify and mitigate any risk associated with the following assumptions:

- The UONFO project has the full support of the University of Newcastle staff and Executive Committee and support will not be withdrawn during project implementation.
- Adequate hard drive space will be provisioned for the UONFO software system.
- Adequate wireless and wired network connections are available.
- Initial training of 5 hours per group is sufficient to learn how to operate the system as a Student Hub staff member.

Constraints. Several constraints have been identified for the UONFO project. It is imperative that considerations be made for these constraints throughout the project lifecycle. All stakeholders must remain mindful of these constraints as they must be carefully planned for to prevent any adverse impacts to the project's schedule, cost, or scope. The following constraints have been identified for the UONFO project:

- Exceeding the budget by more than 15% overall requires written approval by the Executive Committee for project continuance.
- Exceeding the schedule by more than 8 months requires written approval by the Executive Committee for project continuance.

2.4 Significant milestones

Table 2.2 Significant project milestones sorted by date.

Initial identified milestones, by date.	
Date:	Milestone
July 2017	Project plan completed and approved
	Software design specifications approved
August 2017	Software development begins
December 2017	Hardware installed at specified locations
January 2018	Software completed and tested
Feb 2018	UONFO boards ready for use

2.5 Project budget summary

Appendix A is a summary of the project budget based on the estimated costs required for the project to be successful. Costing for documentation was calculated based on the average Australian salary for a software engineer (Software Engineer Salary (Australia)).

2.6 Key stakeholders

The Project Manager, Sponsor and team will all play key roles in managing the scope of this project. As such, the project sponsor, manager, and team members must be aware of their responsibilities to ensure that work performed on the project is within the established scope throughout the entire duration of the project. Appendix B defines the roles and responsibilities for the scope management of this project.

3. Project Management Approach

3.1 Project management methodology

Agile software development was selected for this project due to the adaptive planning it offered, as well as allowing direct user feedback with the development of the system. Agile software development describes a set of principles for software development under which requirements and solutions evolve through the collaborative effort of self-organizing cross-functional teams (Agile Model Driven Development (AMDD)).

The UONFO project will go through many iterations due to feedback from stakeholders of the system. Each type of stakeholder will provide a unique perspective on the system and how it could better suit their needs. At the core of UONFO is a suite of features allowing communication between staff and students at UON. These features will not interact, allowing for independent development by a smaller team.

Two Agile methodologies supported this project perfectly. Feature driven development focuses on the stakeholder-valued functionality of the system, internally supported by rapid prototyping for direct feedback on a working test environment.

3.1.1 Feature driven development (FDD)

As the name suggests, Feature Driven Development focuses on the functionality of a system that stakeholders consider essential. Each function is generally expressed in the form of action – result – object. Example functions of UONFO expressed in this form are “Display current events to students” or “Provide directions to students”.

Initial modelling of the system develops a foundation for the above features to be sorted into a “feature list” – a broad set of categories defining what the project will achieve. Features are then assigned to development teams for detailed modelling, programming, and testing.

The following figure demonstrates the FDD process;

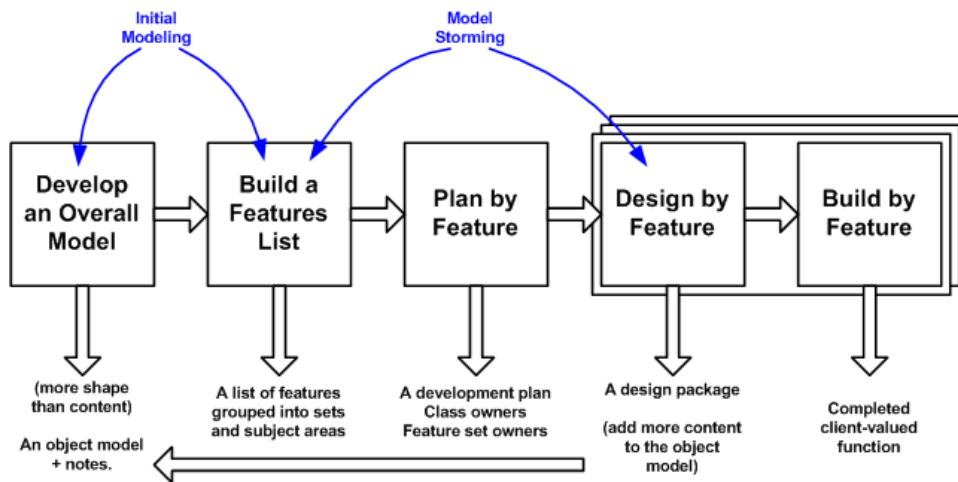


Figure 3.1 Feature driven development (Agile Modelling, 2005)

Interviews with stakeholders provided the following features, sorted into feature sets;

Directions

- Provide directions to the location and display a map to user.
- Transmit directions to phone application.

Advertisement

- Display current events and advertisements to user.

University

- List current available degrees.
- Display course information.
- Display historical information (building specific).

Questions

- Provide answers to commonly asked questions.
- Provide information about parking.

Accessibility

- Verbal interaction with system.
- Access the system for mobility impaired users.
- Access the system in other languages.

3.1.2 Rapid (extreme) prototyping

Rapid prototyping is a responsive methodology capable of adapting to changing stakeholder requirements. Developers will operate in very short development cycles producing frequent “releases” for stakeholders to test and provide feedback.

Generally, rapid prototyping and feature driven development do not blend very well. However, as each feature in UONFO does not interact with other feature sets they can be treated as individual programs of their own. Developers can focus solely on their feature, producing testable software marketed directly to stakeholders in very brief time frames.

Rapid prototyping will only be used during the “Design by feature” and “Build by feature” stages of the project. Feature driven development will be followed for all other aspects.

3.2 Strategy and procedures to achieve project goals / objectives

The primary strategy for achieving project objectives will be to ensure they are defined using the “SMARTER” method (Book Sources). The SMARTER acronym stands for goals that are specific, measurable, achievable, relevant, time-bound, evaluated, and re-adjusted. The final two steps are added to ensure goals are flexible to changing stakeholder expectations; affording re-adjustments to methods and techniques.

Frequent feedback from stakeholders as defined by the communication plan will provide an avenue for changes to the project within certain bounds. Weekly and monthly meetings with stakeholders – combined with feedback from rapid prototyping – will ensure the project is on path and performing to expectations; no surprises should occur at the end of the project.

Project creep via budget, deadlines, or additional requirements are managed through the inclusions and exclusions stated in this document which clearly defines the project scope. Change management will be handled by the Project Manager and meetings with the Executive Committee.

4. Scope Management

4.1 Project scope statement

The UONFO project will consist of creating a software system to support dispersed information points at the University of Newcastle. The project will be completed by February 2018. Modules of the software system will include directions to campus locations, answering frequently asked questions, information about current and future courses, historical campus information, language and accessibility support, advertisements, and information about upcoming events.

4.1 Work breakdown structure

The following diagram is our work breakdown structure (WBS). This is a breakdown of our project into smaller, deliverable-based components.

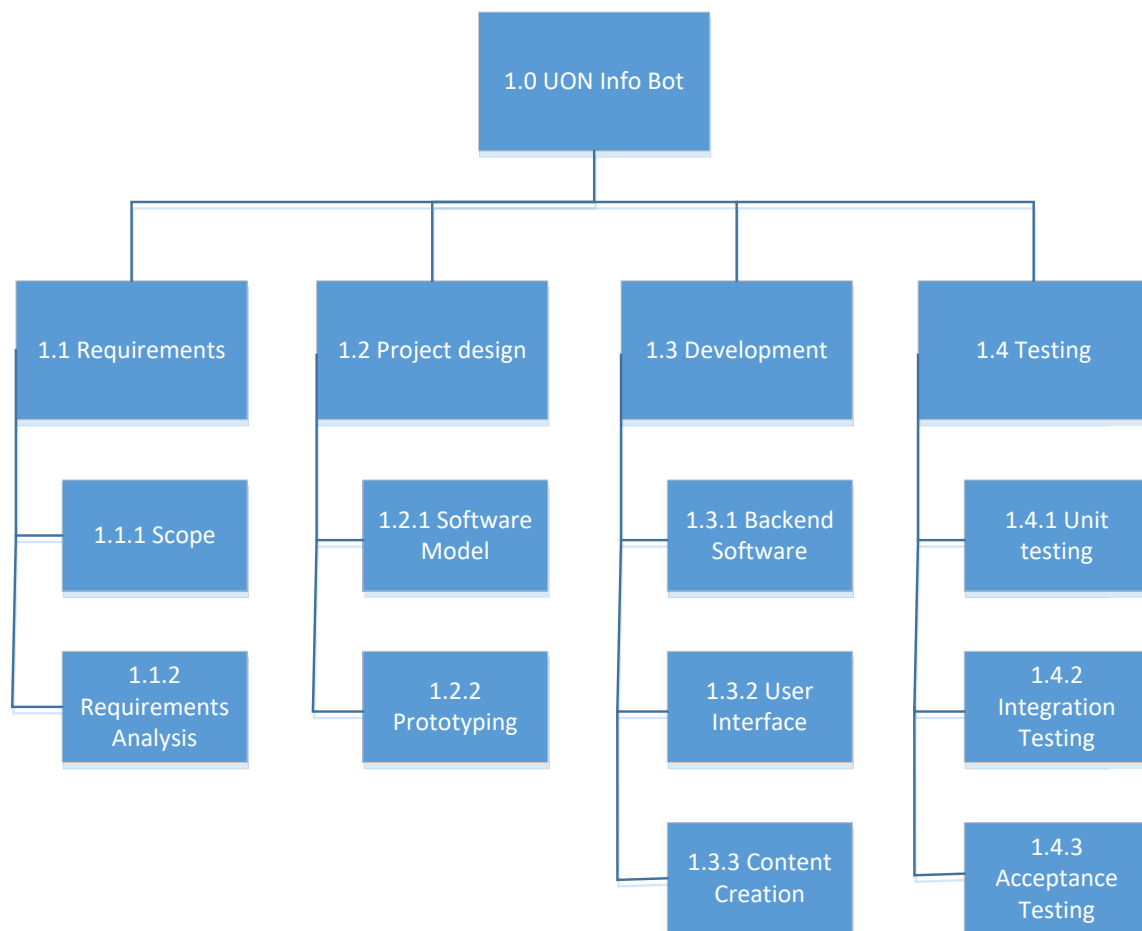


Figure 4.1 Work breakdown structure.

Our WBS has four main components:

- Requirements – The gathering, analysis and documentation of all requirements for the project
- Project Design – The designing of the project to meet all requirements
- Development – The implementation of UONFO
- Testing – The testing and tracking of our product to ensure it meets the acceptability criteria of our requirements and is approved by stakeholders

4.2 Scope control plan

The scope of the project is controlled solely by the Project Manager in accordance to the Work Breakdown Structure. The Project Manager will ensure that only work as outlined in the WBS is completed by the project team to ensure all goals are met and that scope creep is not accidentally introduced. Any changes to the scope must be done via the proper channels for recommending changes to the scope of the project. Changes can be recommended by any project team member or any sponsor of the project.

If there are pending changes to the scope, the Project Manager must have them in a formal Project Change Request document. If the project manager deems it a suitable request, they shall send it to the Sponsor for review. If both the Project Manager and Sponsor approve of this change, it shall formally be accepted by signing the appropriate Change Control document. Upon this change the Project Manager will update all the relevant project documents and relay the change of scope to all team members and stakeholders.

5. Requirements Management

5.1 Requirements management plan

Requirements Management Approach. For UONFO, we will split the requirements management into four parts. Requirements identification, analysis, documentation and ongoing management are the areas covered. The relationship between the four areas is outlined in figure 5.1.

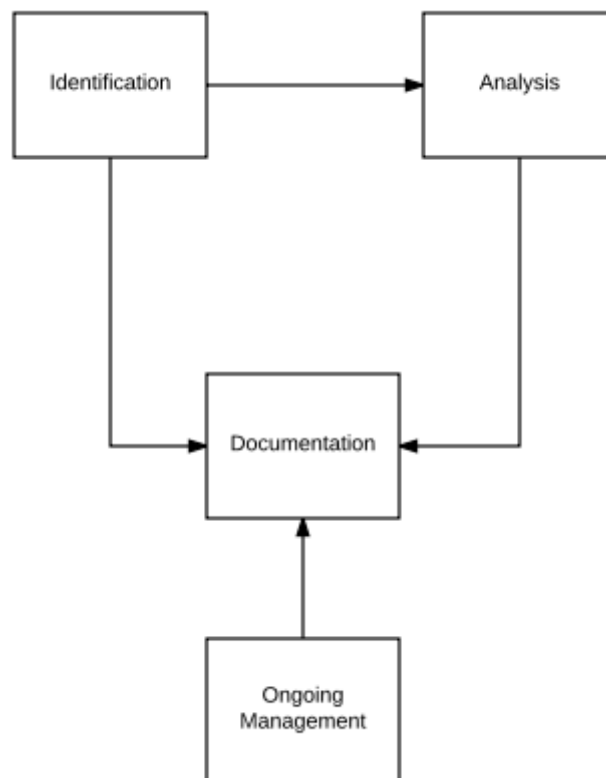


Figure 5.1 Requirements management relationship flow.

Requirements Identification. The collection of requirements will be done by a survey to monitor the frequent activities that cause congestion. Via interviews and correspondence, the team will present these factors to all major stakeholders and gather any additional concerns they present. Further requirements gathering will take place using a feedback system implemented during in-hub testing, allowing users to propose additional features the system may require.

Requirements Analysis. The then identified requirements are analysed and categorised into project and product requirements. This analysis will also help to place each requirement in the work breakdown structure and determine their corresponding work activities. Requirement accountability and prioritisation will be established. For requirements, the acceptability criteria and metrics will be defined.

Requirements Documentation. After identification and analysis, the requirements are documented and assigned to the personnel which were determined to be accountable. The project team will record the methodology of status tracking and reporting to be used by those accountable for each requirement. All requirements will be added to the completion checklist to track and compare progress and ensure that the final product meets all requirements before the project is closed.

Ongoing Requirements Management. The project manager will oversee all team members and ensure that any concerns, issues or changes with requirements are reported regularly. This will continue throughout the entirety of the project, and with issues reported promptly the project manager will more easily handle and delegate the needed changes also informing the involved stakeholders. Any additions or alterations to the list of requirements must be first presented to the project manager who will seek approval from all stakeholders involved with the changes. The project manager will also seek approval from related stakeholders for the completion of each requirement to ensure that it is acceptable before the closure of the related development phase.

Configuration Management. Changes to the document and version control will be handled using google drive. Google drive allows the team to work on documents concurrently. All changes to the document are saved as the work is done, there is the option to revert to a previous state at any time. This combination helps to prevent loss of work while allowing the team to work on and view up-to-date documents effortlessly. In the drive, there will be a document already approved and this document can only be changed by a single authorized member of the project team. A second document will be present, this document is the one for proposed changes, upon approval the authorized member for the first document will be able to edit the original document, bringing over the now approved changes. Upon change of the approved document, the project manager will distribute the newly approved version to all project stakeholders.

Requirements Prioritization Process. The project manager of UONFO will coordinate meetings with the stakeholders of the project to discuss the requirements found. During these meetings, a priority level will be assigned to each documented requirement. As this priority system is qualitative, we will assign priority categories as shown in table 5.1.

Table 5.1 Requirements prioritisation with description sorted descending by importance.

Requirements prioritisation	
Priority Category	Description
Highest	Critical requirements, if these are not met the project may be considered a failure.
High	These requirements are very important, but not necessary to consider the project a success. This may include non-core functionality of a product.
Intermediate	Requirements that present only a slightly increased return on time or cost investment. This may also include requirements deemed useful but only by approximately half of stakeholders.
Low	Requirements that are desired by some stakeholders but with little improvement offered. These may be desired by a minority of stakeholders or many less-influential stakeholders.
Lowest	These are requirements desired by stakeholders with little influence or may be requirements that would cause the least impact if not utilised.

As the project progresses, the project manager will continue to coordinate these meeting to re-assign the priority of requirements as conditions change. This helps to keep the importance and completability of each requirement up-to-date.

Product Metrics. For UONFO our goal is to alleviate pressure on the student hubs and give newcomers to the campus an easier experience with navigation. As we track the usage of UONFO and the load upon the student hubs of the campus, we form product metrics on how regularly our system will be used, the change in relevant workload on the hubs and the overall satisfaction of the users.

UONFO Usage. The UONFO system usage will be tracked and desired results are as follows:

- During in-hub testing, the system should be used at least 10 times a day, this indicates some interest in the system from the target users
- When initial set of terminals are installed around the campus, usage should increase to 30 times a day indicating that the expansion of the system has resulted in greater net usage
- One year after expansion of the system, we expect the system to be used at least 50 times a day, this extra time should allow greater exposure of the system to the target users.

User Feedback. The UONFO system will prompt users for suggestions and an experience rating after each use, using this gathered data we hope meet the following expectations:

- During in-hub testing, it is likely that the system may operate slowly, with much missing functionality. Given this is a very early testing phase, the overall rating is less reliable and we only aim to achieve an average of 60% approval rating from user feedback.
- Once the system has been expanded with exterior terminals around the campus, additional functionality will already be added. The development of this system will continue long-term as additional maintenance is performed, fixing identified issues and implementing additionally requested functionality. Within one year of the implementation of additional terminals around the campus, we expect a 70% approval rating of the system.
- Within one year after the expansion of the system, much refinement should take place. After this time, to consider the project successful, we should expect an approval rating of at least 80%.

Student Hub Pressure. Given that not all assistance offered by the student hub is feasible to implement into UONFO, we cannot expect to reduce any more than 20% of the load on the student hub. Given that the assistance at the student hub is only available from paid staff, a 20% reduction on workload would allow those staff members to allocate more time to less

trivial tasks, even reducing the number of staff required at a single time, improving their budget long term. We expect to meet the following conditions:

- Initially due to under-exposure and lack of features, during in-hub testing we expect only a 5% reduction in student hub staff workload.
- Immediately following the expansion of our system via additional terminals, given additional features and greater exposure to the target users, we expect a 10% reduction in staff workload.
- One year following the expansion of UONFO, all the additional features, refinement of the system functions and long-term exposure to the target users, we should achieve a 20% reduction in staff workload within the student hubs.

Budget. Given that this system is not a direct form of revenue generation, it is important that the agreed upon budget is strictly met. It is not certain that additional funding will be granted if the budget is underestimated. To consider this project a success we must ensure that the total project costs will not exceed the set budget.

Time. While this project is not critical to running the university, it is still crucial that it is completed within the estimated time. The main reasons for pressure upon the time constraints is the long period of testing and maintenance required to develop a secure software system.

If development is delayed and UONFO takes an unreasonable amount of time to reach an effective state, users may be given a bad impression of the system and not use it in the future. As we are working with technology, if physical implementation is delayed for too long, the estimated hardware costs may be irrelevant as desired products become no longer available.

5.2 Requirements management matrix

The following traceability matrix (moved to appendix) is used to track completion of the project. By placing requirements into the traceability matrix, we enable the easy tracking of progress. We can see the stakeholder responsible for accepting the completion of each requirement, by checking the signature in the User Acceptance Validation column. Before the project is closed, all requirements in the traceability matrix should be accepted and signed. This matrix should be updated following any changes to requirements. Appendix E is an example of the requirements management matrix used in this project.

6. Stakeholder Management

Stakeholder management covers how we analysed our stakeholders, how we will manage them, and how we will engage with them. The stakeholders for the UONFO Project will be identified and classified based on their interest and influence on the project. They will then be given a priority based on their relative importance, which will affect how they are to be engaged with as the project progresses.

6.1 Stakeholder management plan

The stakeholder management plan defines the process and requirements to engage with stakeholders based on their needs, interests, and abilities to influence the project. The main stakeholders for this project are Student Services Department, University IT Department, Staff, Students, and Visitors.

Table 6.1 illustrates the goals, interests, and level of influence of main stakeholders, as well as their roles in this project.

Table 6.1 Stakeholder power / interest matrix.

Stakeholder power / interest matrix					
Stakeholder	Goals	Power	Interest	Action	Plan
Student Services Department	Successful delivery of the project.	High	High	Key Player	Sign off key decisions during the project.
IT Department	Software development.	High	High	Key Player	Partner in development and implementation of software.
Students	Easy access to information.	Low	High	Meet their needs	Ensure their requirements are met.
Staff	Ability to assist students more efficiently.	High	Low	Meet requirements	Consult on specifications of the project.
Visitors	General information.	Low	Low	Show consideration	Show consideration via regular updates.

6.2 Stakeholder analysis

After identifying all stakeholders for the UONFO Project, the project team will classify and analyse each stakeholder based on their influence or interest, plan a management approach and determine the appropriate levels of communication and participation each stakeholder will have on the project.

Figure 6.1 will be used to establish stakeholders and their level of influence and interest as part of stakeholder analysis.

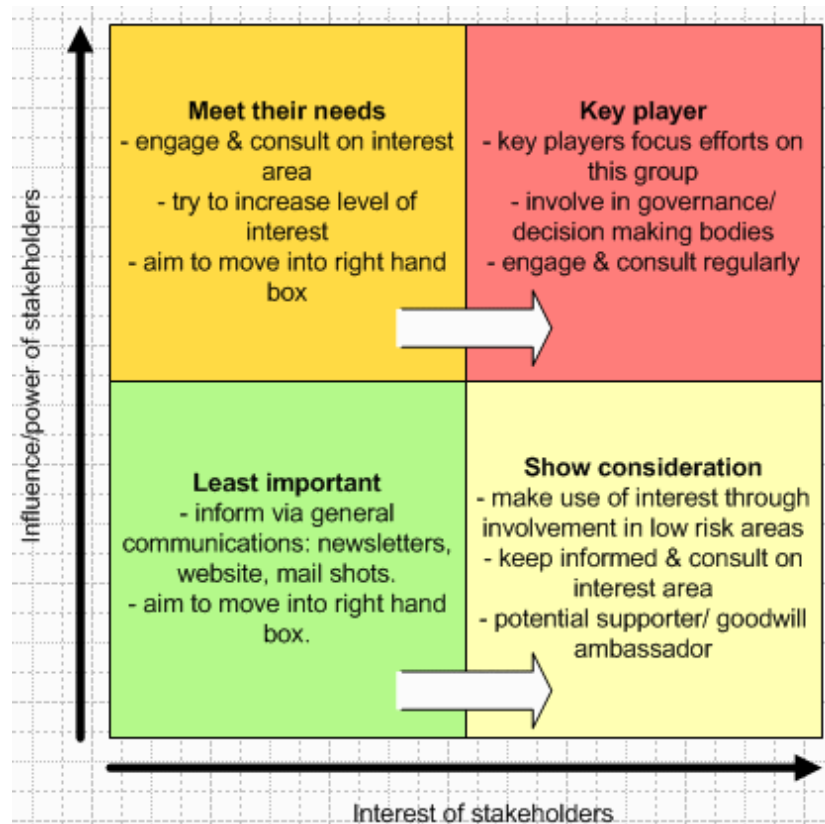


Figure 6.1 Power versus interest grid from Eden and Ackermann (1998: 121-5, 344-6)

As explained in Figure 6.1, stakeholders are held at different priority levels depending upon their involvement in the project. As per the top-right quadrant of this figure, the key players will be Student Hub and the Executive Committee is the highest authority in this project. It will approve or reject any changes in the project regarding schedule, cost or scope of the project. IT Department will take part in the development, testing and implementation of the software. They should be participatory members in all project status meetings as required.

The top-left section represents the staff of the university, as they have high influence on the project they will be involved in defining the purpose and needs to ensure the successful implementation of the project.

The bottom-left section represents stakeholders who don't have a high influence or interest in the project. It includes visitors who are not regular part of the university but would like to engage in certain activities at the University like public seminars and events.

Finally, the bottom-right section represents students who don't have any authority over the project but they have the highest level of interest. They must be kept informed on project status and process through frequent communication.

6.3 Stakeholder Engagement

Stakeholder engagement is the process used by an organization to engage relevant Stakeholders for a purpose to achieve accepted outcomes (AccountAbility, 2008).

Figure 6.2 demonstrates the relationship between stakeholder influence and Stakeholder management approaches.

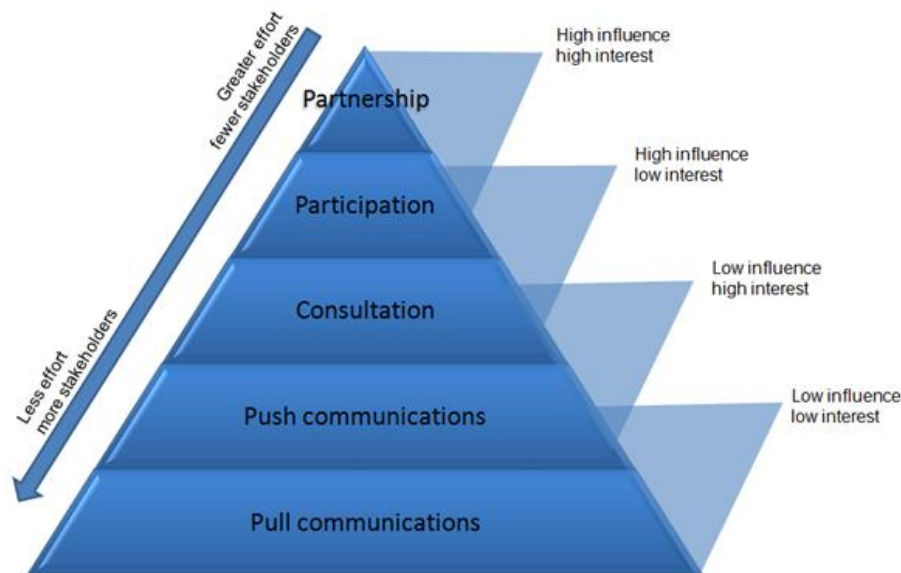


Figure 6.2 Stakeholder Influence vs. Stakeholder Engagement Approaches

Table 6.2 explains each section of Figure 6.2 on how stakeholders will be engaged with depending on their influence and interest levels. As per Figure 6.1 Student Services and the IT department will be in participation, University staff will be consulted, and student and visitors will have push communications.

Table 6.2 Communication types for stakeholders

Description of communication types	
Communication	Description
Partnership	Two-way engagement in decision making
Participation	Working in a team with each party is responsible for an activity
Consultation	Involved in the project but without any responsibility or ability to influence it outside consultation boundaries
Push Communications	Organisation may engage with stakeholders on various aspects of the projects
Pull Communications	Information is published and stakeholders choose whether to engage with it

7. Schedule Management

7.1 Schedule management methodology / approach

The project schedule will be developed using MS Project starting with the deliverables as specified in the Work Breakdown Structure (WBS). Each deliverable will be broken down within the activity list, where the steps to complete each component are defined. The activity sequencing will be used to order each component of work and assign dependencies between project activities. Activity duration is given and is an estimate of the time required to complete each activity.

On completion of the initial schedule, it shall be reviewed by the project team and resources shall be assigned to each project task. The project team must approve the defined work assignments, durations, schedules and assigned resources. At this point the project sponsor will review and approve the schedule, giving approval for its implementation.

7.2 Software

The project manager will be responsible for streamlining activity definition, sequencing, and estimating duration and resources with the project team. The project manager will also create the project schedule using MS Project, the Activity List (Appendix F), Gantt Chart (Appendix D), and Critical Path (Appendix C) were created using MS Project. MS Project will continue to be used throughout the project to define, assign and manage tasks and resources and to develop reports for use in weekly meetings.

7.3 Schedule monitoring and control plan

The project schedule will be reviewed and updated as necessary during weekly meeting with stakeholders. Each project team member associated with each activity will provide actual start, actual finish, and completion percentages.

The project manager is responsible for holding weekly schedule updates/reviews; defining the impacts of schedule changes; submitting schedule change requests; and communicating schedule status to the project sponsor and the stakeholders outlined in Appendix B.

The project team is responsible for participating in weekly schedule updates/reviews; communicating any changes to actual start/finish dates to the project manager; and participating in schedule change resolution activities as needed.

The project sponsor will be kept aware of the project schedule status and review/approve any schedule change requests submitted by the project manager.

7.4 The critical path

The critical path of a project defines a sequence of tasks which must be completed on time for the project to finish on the due date. Any task that is on the critical path cannot be started until its predecessor is complete; if it is delayed by a day then the entire project will be delayed unless another activity on the critical path is completed a day earlier. Appendix C defines the critical path for the UONFO project.

7.5 Gantt chart

Similar to a critical path, a Gantt chart defines all activities of a project as a sequence of tasks. Each task has its own set of dependencies and can be used to identify periods in a project where the balance of tasks to resources is a concern. Appendix D defines the Gantt chart for the UONFO project.

7.6 Activity list, sequencing, and duration estimates

The activity list defines each work component of the project. Each activity is assigned an ID, Name, Description, Responsible Team Member(s), Estimated Duration and Activity Dependencies. The activities are listed in sequence order, noting any preceding activities and estimated duration.

7.7 Milestones

A project milestone highlights the completion of an important event in the projects life cycle for example the completion of a project phase, task, decision, or deliverable. The following Table 7.1 outlines the milestones in chronological order, noting wither they are mandatory or optional, their expected completion date and method of verification.

Table 7.1 Project milestones sorted by completion date.

Milestone List				
Project: UON Info Bots			Date: 26/04/2017	
Milestone No.	Milestone	Mandatory/Optional	Completion Date	Verification
001	Project Start	Mandatory	24/03/2017	Sponsor Approval
002	Complete Project Management Plan	Mandatory	29/05/2017	Sponsor Approval
003	Complete Software Prototype	Mandatory	23/06/2017	Sponsor Approval
004	Complete Testing	Mandatory	04/07/2017	Sponsor Approval
005	Install Student Hub Systems	Mandatory	11/07/2017	Sponsor Approval
006	Complete System Trial	Mandatory	20/11/2017	Sponsor Approval
007	Install Systems Across Campus	Mandatory	15/01/2018	Sponsor Approval

8. Risk Management

8.1 Risk management plan

The purpose of this section is to define the process taken to identify risks, uncertainties, and opportunities; and to provide a management framework to ensure the above are handled appropriately throughout the remainder of the project. The Risk Register (Appendix H) will be considered a ‘snap-shot’ of relevant risks as of the version date of this document.

Risk Management Roles and Responsibilities. Roles and responsibilities for different team members are as follows:

Executive committee. The Executive Committee will be provided monthly with a current risk register and receive project status reports which highlight ‘Critical’ risks. The Executive Committee will receive these documents, as required, when additional threats or opportunities emerge or the impact of a previously identified risk changes.

Project manager. The Project Manager will be responsible for Development and implementation of a project risk management plan, conducting regular risk management and assessment providing regular Status Reports to the Executive Committee.

Project team. All members of the Project Team will be responsible for the identification, analysis, and evaluation of risks and continual monitoring throughout the project life cycle.

8.2 Top Three Risks

The top three high probability and high impact risks to this project are:

Disruption to surrounding areas during installation. Due to road and foot traffic installing the UONFO Stations across the campus construction crews will have difficulty placing the concrete slab and installing the proposed systems resulting in delayed installation and more money being spent. The Project Manager will schedule installation at least two weeks before the semester begins to reduce interruptions and mitigate this risk.

System hack. During the testing phase a third party has gained access to the system, altering the functionality of the system and damaging project data crucial to the development of the system. The project manager will mitigate this risk by using advanced encryption standards and having a system back up externally to restore the project.

Consistent inclement weather. Poor weather causes interruptions or delays to installation of UONFO information points. The project manager will mitigate this risk by using a marquee or alternate weather protection.

8.3 Risk Management Approach

A qualitative approach was taken for the UONFO project to define risk categories (such as technical, physical, et cetera) and evaluate likelihood and impact. The Project Manager would report the initial risk analysis to the Executive Committee to seek advice on any adjustments they felt necessary, updating the risk register as required. Upon completion of the UONFO project, the risk register will be used to reflect on how risks were managed and to highlight areas of improvement. These reflections will be stored in a knowledge base for future related projects.

Risk Qualification and Prioritisation.

Each risk has been given a probability and impact out of ten; and a risk score which is the product of the two values. Subsequently, risks will be graded as **Low (L)**, **Moderate (M)**, **High (H)**, or **Critical (C)** in accordance to the matrix shown below.

Probability	10	10	20	30	40	50	60	70	80	90	100
	9	9	18	27	36	45	54	63	72	81	90
	8	8	16	24	32	40	48	56	64	72	80
	7	7	14	21	28	35	42	49	56	63	70
	6	6	12	18	24	30	36	42	48	54	60
	5	5	10	15	20	25	30	35	40	45	50
	4	4	8	12	16	20	24	28	32	36	40
	3	3	6	9	12	15	18	21	24	27	30
	2	2	4	6	8	10	12	14	16	18	20
	1	1	2	3	4	5	6	7	8	9	10
	1	2	3	4	5	6	7	8	9	10	
Impact											

Figure 8.1. Impact probability matrix with risk score grading.

Utilisation of the above matrix allows for risks to be labelled into four broad categories of consequence. These categories define the expected minimum level of action.

- Critical risk – detailed research and management planning required
- High risk – senior management attention needed
- Moderate risk – management responsibility must be specified
- Low risk – manage by routine procedures

Appendix H contains a full list of identified risks which have been categorised using figure 8.1 and then sorted by risk level. Appendix G provides key terms for the risk register.

8.4 Risk Monitoring

Risk monitoring is the process of identifying new risks, tracking identified risks, executing risk response plans and evaluating their effectiveness. It helps to determine that;

- Risk management rules and procedures are being followed.
- Risk responses are implemented as planned.
- Risk response actions are as effective as expected.
- Validity of the assumptions of risk response.
- Monitor upcoming risks and risk triggers.

Risk monitoring tools involve risk reassessment and risk audits. In risk reassessment, we identify new risks and risk responses are examined and documented in risk audit. Risk monitoring will be a continuous process throughout the project. As risks approach on the project schedule, the project manager will ensure that the appropriate risk manager provides the necessary status updates which include the risk status, identification of trigger conditions and the documentation of the results of the risk response.

Reporting risks to the stakeholders will be one of the top priorities of the project management team. Effective risk management is not only about understanding, modelling or managing risks, it is to report risks and their impact on the project.

The project management team has developed following risk reporting levels:

- **Leadership level** will develop a risk reporting system that is aligned with other project management structures and processes.
- **Senior level** will report risks impacting cost.
- **Management level** will ensure risk reporting system works efficiently.
- **Support level** will report risks to stakeholders and explain measures necessary to deal with those risks.

8.5 Risk Mitigation and Avoidance

Risk mitigation is the systematic reduction in the extent of exposure to a risk and the likelihood of its occurrence.

The project team had developed responses to the identified risks. The risks for this project will be characterized as impacting the parameters of cost, time and performance. All risks will be assessed based on their impact on these parameters. The project management team will develop the most effective ways to deal with each risk in accordance with the defined parameters.

Risk Acceptance. Risk acceptance does not reduce the effects of any risks, yet it is still considered a strategy. This is the common option when the cost of other risk management options overweighs the cost of the risk itself. A company that does not want to spend money on minimizing the impact of a risk will use acceptance strategy.

Risk Avoidance. Risk avoidance is opposite to risk acceptance. It circumvents any exposure to potential risks in the first place. It is usually the most expensive of all strategies.

Risk Limitation. Risk limitation is the most common strategy adopted by companies. It reduces company's exposure to risk by taking some action.

Risk Transference. Risk transference is the process of relocating risks to a third party that is willing to accept the risk. It can be beneficial to the company so it can focus more on their core competencies. This is an overall approach to reduce the impact of risks or probability of occurrence.

The purpose of this section is to define the process taken to identify risks, uncertainties, and opportunities; and to provide a management framework to ensure the above are handled appropriately throughout the remainder of the project. The Risk Register (Appendix H) will be considered a 'snap-shot' of relevant risks as of the version date of this document.

8.6 Risk register

A risk register was created to track identified risks to the UONFO project. Appendix H contains the risk register for this project and is considered a “snapshot” as of the current version of this document. The risk register allows for tracking of issues and highlights risks that require further impact analysis should that situation occur.

The risk register will be updated as the project progresses, with new risks being added as they are identified and current risks being reassessed to ensure any possible mitigation or prevention solution is applied.

The following demonstrates how each risk was categorised:

- Possible risks were identified by a brainstorming session with stakeholders.
- Each risk was then assigned a probability and impact out of 10.
- Risk level was then determined using figure 8.1 and then ranked descending.
- and Potential solutions were determined should the situation occur.

Identified risks will be closely monitored with critical risks being reported to the Executive Committee at each project status update.

9. Human Resource Management

Human resources management plan is important for successful completion of the project by ensuring that appropriate human resources are acquired, teams are efficiently trained and their activities are effectively managed. Human resources management plan includes:

- Roles and Responsibilities.
- Project Organization Charts.
- Staffing management.

9.1 Roles and Responsibilities

Roles and responsibilities of team members are important for the progress of any project. Various team roles and responsibilities have been established for UONFO project.

Project Manager (PM). The project manager is responsible for the overall success of the UONFO project. He must authorize and approve any changes to the project. It is the responsibility of the PM to develop an efficient communication with all stakeholders and keep them informed about the progress of the project. The PM will assess the performance of all team members and ensure proper training facilities are in place to fill any gap in their skills.

Software Development Team (SDT). The software development team is responsible for design, coding and testing for the UONFO project. The SDT will communicate with the IT department and Student Services to ensure that system is upgraded regularly to fulfil the needs of students and visitors. The SDT will also be responsible for the security of sensitive information of the students stored in the UONFO database.

Installation Team (IT). The Installation team will be responsible for the installation of the UONFO system. Initially, the IT will install few units at student hubs only for testing. After the testing phase, the IT will be responsible for installing the system at various locations throughout the university. The IT will report any damages to the hardware or difficulties in installation to the project manager and will not authorize any changes in the location of the system without the approval of the PM.

Training Team (TT). The training team will be responsible for training the Student Services staff during the testing of the UONFO project. The TT will also be responsible for reporting any problems to the PM that the staff and students might face during the testing phase of the project.

Functional Manager (FM). The functional manager is responsible for providing resources according to the staffing plan. The FM will work with the PM to determine skill sets required and hire staff based on the required skills.

9.2 Project Organizational Charts

The relationship between project tasks and the team members is shown in table 1. The project manager must review and approve any changes to project responsibilities in accordance with project's change control process.

Table 9.2: RACI chart showing relationship between tasks and team members

RACI Chart					
	Project Manager	Software Development Team	Installation Team	Training Team	Functional Manager
Requirements Gathering	A	R	R	I	C
Coding Design	A	R	-	-	I
Software Development	A	R	-	-	I
Unit Installation	A	I	R	-	I
Testing	A	C	C	R	I
Training	A	I		R	C

9.3 Staffing Management

Staff acquisition. Staff for the UONFO project will consist entirely of internal resources. The project manager will be responsible for the acquisition of staff based on the required skills and will negotiate with the functional manager to identify resources according to the organizational structure of the project.

Resource Calendars. The UONFO project will last for 9 months. It is the responsibility of the project manager to ensure that all the necessary resources are acquired before the start of the project. The software development team will design, code and test software in 5 months while the installation team will install the system at student hubs for initial testing. After the successful testing phase, the installation team will install the units at the allocated spaces across the university in 3 months. After the completion of the installation process, the training team will be responsible testing the system and also train the student services employees.

Performance Reviews. The project manager will communicate the expectation of work to the team members. Formal staff performance review will be conducted on each member to identify any performance issues and provide feedback on their assigned tasks.

10. Communications Management Plan

10.1 Stakeholder Communication Requirements

The Project Manager will contact each stakeholder to gather their preferred communication frequency and how they wish to be contacted, which shall be stored by the Project Manager inside the Communication Matrix. If a stakeholder requires additional or specific communications this information will be kept inside the Stakeholder Register. All stakeholders must have access to their required channels for communication, and secure access to those which transmit sensitive information.

All identified requirements shall be stored inside the Stakeholder Register along with the Communication Matrix. All communication shall be done using these documents via the use of the communications flowchart.

10.2 Communications Management Constraints

Constraints on the communications of the project are:

- The budget
- Project schedule
- Resources allocated to communications
- Confidentiality of information

All communications must adhere to the Communication Matrix so that the project remains on budget and excess resources are not consumed. Any deviation from the proposed frequency of communication can lead to increased costs or schedule delays, which all must be approved by the Project Sponsor. Any confidential information that is to be communicated must be approved by higher management, for which the Project Manager is responsible for obtaining.

10.3 Roles

Change Control Board. A group of people who authorise changes within the project. All communications regarding scope, schedule, or budget should be sent to these members as well.

Customer. The customer for this project is the University of Newcastle. They are to be informed of any changes of scope or schedule and should be able to review project prototypes.

Key Stakeholders. These are the stakeholders who need to have communication within the project as they are the ones directly impacted by the project.

Project Manager. A management level role who manages the execution of the project. The Project Manager is the main communicator in the project who manages resources, reports on project progress, and provides guidance on how to proceed.

Project Sponsor. An executive level role who is the champion of the project. The Project Sponsor is entirely responsible for the success of the project as well as its funding.

Project Team. All people who are working on the project. Many their interactions will be with the Project Manager and other team members in meetings. The Project Team is responsible for carrying out the project to completion.

Technical Lead. One person on the Project Team responsible for all technical designs and implementations. This person requires constant communication with the Project Team and Project Manager.

10.4 Communication Methods and Technologies

Communications with stakeholders can be either face to face, a conference call, or e-mails. Conference calls are to be undertaken using Skype For Business and e-mails are to be sent using the Microsoft Office platform.

TechDynamic maintains an online drive using Microsoft SharePoint to provide document updates and store archived reports. Updates to the documents on this platform are ongoing to ensure the latest versions are properly distributed. In the case where a stakeholder does not have access to this platform, they are to be assigned a unique login for a website portal providing the up-to-date documents. It is the Project Managers job to ensure that these documents are mirrored correctly across platforms.

10.5 Communication Flowchart

A communications flowchart has been created to enforce the proper communication channels be used. If a situation occurs which does not fit into this flowchart it is up to the Project Manager to communicate with the Project Sponsor on the matter and update this flowchart accordingly.

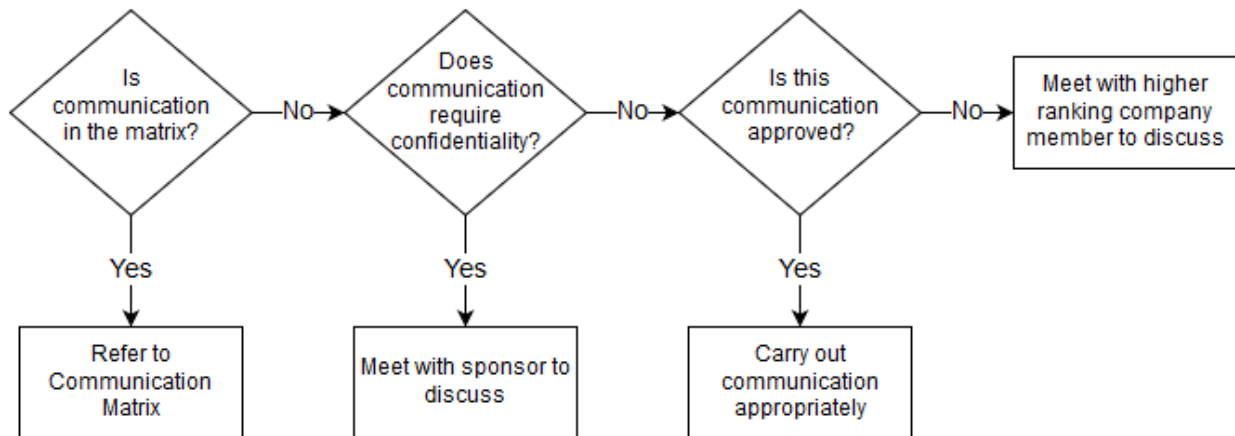


Figure 10.1 Communications flowchart showing series of decision

10.6 Communications Matrix

Appendix I identifies the communications requirements for this project in table form.

11. Cost Management Approach

Estimating pre-tender costs. Estimates for the UONFO project are created for each WBS element down to the second level. Resource categories are identified for each WBS element to anticipate skill sets and staff labour requirements.

Approximate costs are estimated based on the resource requirements assigned to the tasks; considered resources are staffing, equipment, external expertise, and loss due to disruption. Totals for each WBS element were allocated in a bottom up method to determine the overall anticipated costs at higher WBS elements.

Forecasts. Forecasts is the anticipated increase in the cost of a project as a result of various factors such as inflation, market conditions, supply constraints, and project complexity. The project estimate is to be expressed in out-turn dollars to reflect the actual project cost at completion.

Out-turn costs are estimated by adding allowance for inflation to the base cost estimate plus contingencies which have been developed in current year dollars as shown in Table 11.1

Table 11.1. Inflation forecasts and budget estimates, in millions.

Description	Costs to date	Year 1	Year 2	Year 3	Year 4	Total project cost
Financial year	2017-18	2018-19	2019-20	2020-21	2021-22	
Current years \$'s	\$0.3	\$0.02	\$0.02	\$0.02	\$0.02	\$0.38
Escalation	Current \$	5%	5%	6%	6%	
Escalation factor	1	1.05	1.1	1.169	1.239	
Out-turn \$'s	\$0.3	\$0.021	\$0.022	\$0.024	\$0.025	\$0.392

Variations. Performance of the project will be measured using the following four Earned Value Metrics; Schedule Variance (SV), Cost Variance (CV), Schedule Performance Index (SPI), and Cost Performance Index (CPI).

The optimal value for these metrics is 1, which indicates that the project is on track with expectations. Table 11.2 details when a project is considered “off-track”.

Table 11.2. Acceptable performance variations as per SPI and CPI.

Performance Measure	Yellow	Red
Schedule Performance Index (SPI)	Between 0.9 and 0.8 or Between 1.1 and 1.2	Less Than 0.8 or Greater than 1.2
Cost Performance Index (CPI)	Between 0.9 and 0.8 or Between 1.1 and 1.2	Less Than 0.8 or Greater than 1.2

The project manager must report the reason for any variance in the yellow bracket and must additionally provide a detailed corrective plan for any variance in the red.

Risks and opportunities. PERT distribution was selected for estimating risks and opportunities as it constructs a smooth curve which places progressively more emphasis on values around the most likely result, at the expense of values around the tails. This sets a baseline expectation that whilst not exactly accurate regarding the final value, will be reasonably close as a planning tool as shown in Figure 11.1.

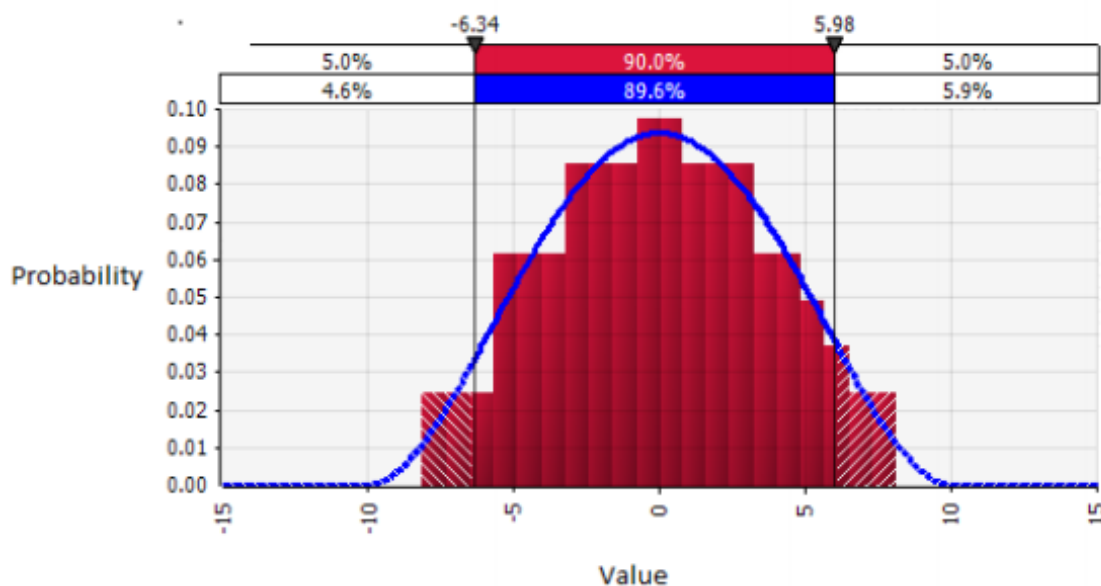


Figure 11.1. PERT distribution example estimation.

12. Project Costs

12.1 Project Evaluation and Review Technique

The following costs were estimated using the Project Evaluation and Review Technique (PERT). This technique uses a three point estimates system that considers the uncertainties surrounding cost, duration and risk. The most likely, optimistic, and pessimistic costs are substituted into Eqn 1 below to calculate the estimated cost of each task identified in the Work Breakdown Structure (WBS). These values have been placed into Table 12.1 where the total costs represent the sum of all the WBS components.

$$PERT = \frac{(O + (4 \times ML) + P)}{6} \quad (1)$$

where: O = optimistic cost

ML = most likely cost

P = pessimistic cost

Table 12.1. Cost Estimates using PERT

WBS #	Most Likely	Optimistic	Pessimistic	Estimate Cost
1.1.1 Scope	\$4,000	\$3,100	\$5,500	\$4,100
1.1.2 Requirements Analysis	\$8,000	\$5,900	\$12,000	\$8,317
1.2.1 Software Model	\$5,000	\$4,000	\$6,700	\$5,117
1.2.2 Prototyping	\$16,000	\$13,000	\$21,300	\$16,383
1.3.1 Backend Software	\$15,000	\$13,000	\$17,900	\$15,150
1.3.2 User Interface	\$12,000	\$10,000	\$16,000	\$12,333
1.3.3 Content Creation	\$5,000	\$4,200	\$7,000	\$5,200
1.4.1 Unit Testing	\$5,000	\$3,700	\$6,400	\$5,017
1.4.2 Integration Testing	\$5,000	\$3,500	\$7,100	\$5,100
1.4.3 Acceptance Testing	\$5,000	\$4,000	\$5,600	\$4,933
Total	\$80,000	\$64,400	\$105,500	\$81,650

12.2 Triangular Distribution

Triangular distribution is a simple average of three cost estimates, pessimistic, optimistic and most likely. This gives equal weight to each of the estimates, as per Eqn 2:

$$\text{Triangular Distribution Estimate} = \frac{O+ML+P}{3} \quad (2)$$

where: O = optimistic cost

ML = most likely cost

P = pessimistic cost

PERT is preferred when there is a lot of historical data from similar types of projects to provide a more accurate “Most Likely” value. Triangular distribution is useful when working in a new environment as “Most Likely” values are usually as accurate of an estimation as the “Pessimistic” (maximum) and “Optimistic” (minimum) values.

Using triangular distribution with the same “Most Likely”, “Optimistic” and “Pessimistic” costs, we get the results in the following Table 12.2:

Table 12.2. Cost Estimates using Triangular Distribution

WBS #	Most Likely	Optimistic	Pessimistic	Estimate Cost
1.1.1 Scope	\$4,000	\$3,100	\$5,500	\$4,200
1.1.2 Requirements Analysis	\$8,000	\$5,900	\$12,000	\$8,633
1.2.1 Software Model	\$5,000	\$4,000	\$6,700	\$5,233
1.2.2 Prototyping	\$16,000	\$13,000	\$21,300	\$16,767
1.3.1 Backend Software	\$15,000	\$13,000	\$17,900	\$15,300
1.3.2 User Interface	\$12,000	\$10,000	\$16,000	\$12,667
1.3.3 Content Creation	\$5,000	\$4,200	\$7,000	\$5,400
1.4.1 Unit Testing	\$5,000	\$3,700	\$6,400	\$5,033
1.4.2 Integration Testing	\$5,000	\$3,500	\$7,100	\$5,200
1.4.3 Acceptance Testing	\$5,000	\$4,000	\$5,600	\$4,867
Total	\$80,000	\$64,400	\$105,500	\$83,300

12.3 Risk Cost

The following Table **INSERT TABLE NUMBER** shows the estimated costs associated with the risks outlined in the projects risk register. Ballpark estimates were used due to the varying severity of these risks on the project.

Table 12.3. Risk Cost Estimates using Ballpark Estimates

#	Description	Potential Cost
1	Disruption to surrounding areas during installation	\$5,000.00
2	System hack during testing	\$2,000.00
3	People entering work zone	\$500.00
4	Damage to existing infrastructure during installation	\$13,500.00
5	Project team member leaves	\$3,500.00
6	Hardware did not meet system specifications	\$12,000.00
7	Defects in supplied hardware	\$12,000.00
8	Loss of project data	\$6,000.00
9	Supplier cannot supply hardware	\$1,000.00

12.4 Cost Forecasts

Using both the project evaluation and review technique and triangular distribution to estimate the projected costs over the next five financial years, we get the results in the following table 12.4. The costs shown include the current financial years estimated costs along with the anticipated maintenance costs.

Table 12.4. Cost Forecasts using PERT and Triangular Distribution

Description	Costs to Date	Year 1	Year 2	Year 3	Year 4
Financial Year	2017-18	2018-19	2019-20	2020-21	2021-22
Escalation	N/A	5%	5%	6%	6%
Escalation Factor	1	1.05	1.1	1.169	1.239
PERT Current Year Cost	\$81,650.00	\$5,443.33	\$5,443.33	\$5,443.33	\$5,443.33
PERT Out-turn Cost	\$81,650.00	\$5,715.50	\$5,987.66	\$6,363.25	\$6,744.29
TD Current Year Cost	\$83,300.00	\$5,553.33	\$5,553.33	\$5,553.33	\$5,553.33
TD Out-turn Cost	\$83,300.00	\$5,831.00	\$6,108.66	\$6,491.84	\$6,880.58

12.5 Pre-tender Budget

Considering the costs estimated within the cost management section of this section, the pre-tender budget is allocated as \$126,460.70. This budget is taken from the \$106,460.70 forecasted cost, as estimated using PERT in section 12.4, along with \$20,000 allocated to account for any project risks mentioned in section 12.3.

12.6 Cost Monitoring

The Project Manager oversees accounting for all costs as well as potential costs. Deviations of actual costs from the estimated costs are presented to the Project Sponsor with potential solutions on how to resolve these issues. All proposed changes to the budget are to be authorised by the Project Sponsor before being officially finalised.

13. Ethics

13.1 Integrity

Integrity is a quality of strong moral principles, usually based on honesty and fairness. To ensure fairness, we try to include all potential users of UONFO. For those who are vision impaired, UONFO will include text-to-speech and voice activation. There are many students studying at the University of Newcastle, from different language backgrounds, whether local or international. To create ease of use for these potential users, UONFO offers additional language support. One of our major goals for success is complete inclusions for all users. With these features, this goal of inclusion should be sufficiently met.

Reliability is important, not only for meeting time and budget constraints, but to also ensure the longevity of products. To ensure our UONFO system is reliable, we are partnering with Microsoft and Intel, two companies which are well known as ethical leaders. By using their products in UONFO, we can ensure that both the hardware and software of the system are ethically sourced and built for longevity.

User confidentiality is important, many companies collect user information and sell it for profit, however we intend to keep our user activity discreet to ensure our users feel safe. To do this we remove the need for user log-ins and we do not track any user activity. This way people associated with UONFO should feel no breach of privacy.

To show complete honesty, all our decisions, progress and goals are visible to the community. We do this by remaining vocal and transparent with the community, publicly announcing our decisions and their potential impacts.

13.2 Competency

We have a system in place to ensure the competency of our employees. Our system involves the gathering of information about our employees, analysing their strengths and weaknesses, and assigning tasks which suit their specialisation.

Before starting the project, we create a framework to analyse the work of the team, assign a supervisory team to monitor the progress of the project, and develop a succession plan. The supervisory team will monitor the staff to ensure work is being completed efficiently, talking to individual team members to understand any issues they have with their assigned tasks.

Supervisors track task progress for each team member, to analyse their proficiencies and ensure that each member is following the team principles.

Based upon the skill of each employee, members of the project team are divided into groups. Their competencies, strengths and weaknesses are identified. Each group is then assigned project goals, which best suit their ability.

There will be proper training facilities in place to ensure each employee is prepared for the upcoming project. Once the project is underway, there will be regular communication between the staff members to ensure that assigned tasks are completed in a satisfactory manner.

13.3 Leadership

To be a global leader and maintain our reputation we need to be trustworthy, communicative and accountable in all areas of our work. For reputation management and communication, we use an in-built review system, allowing users to voice their concerns. We have a customer support service, allowing people to ask us questions and let us know of any issues they have with UONFO. We will also utilise social media to both publicly address issues and concerns, responding to both positive and negative feedback by the community. This social media interaction will also allow us to regularly state changes to our system, keeping the community aware of what we are doing.

We need to ensure that UONFO is a trustworthy system. We will conduct credibility checks and peer reviews to ensure that UONFO isn't skewed toward a particular audience. Our employees are encouraged to propose and discuss new ideas, helping us innovate and move forward.

To ensure accountability, we closely track the work each team and individual members make towards their tasks. Allowing us to not only accept responsibility for any issues that arise, but also find the reason behind the issue. This means we can remain accountable and learn from any issues and mistakes we make.

Communication is an important part of leadership. By holding regular meetings between project team members and stakeholders, we can keep everyone informed on all aspects of the project.

13.4 Engagement

The University of Newcastle has a “Permit to Work” system in place, UON IFS 002, which is designed to reduce the risk of illness or injury to staff, students, visitors and contractors on any UON campus. UONFO will adhere to this by providing disruption notices.

Our team will host regular community meetings to gauge the acceptance of the UONFO project and allow any stakeholders to voice their concerns. Online surveys will be used to allow the broader community to give us their opinions, in case they are unable to attend the meetings. There will also be a concern line available, allowing users to call up and anonymously voice their concerns.

13.5 Health, Safety & Wellbeing

Drugs and Alcohol. As our project involves electrical work and construction, there is no tolerance for workers being under the effects of drugs or alcohol while in the workplace. Any reports of intoxication will result in suspension of the worker and if found guilty, their employment will be terminated.

Work Health and Safety Regulations. All work performed for our project must follow WH&S regulations to minimise the risk of injury or illness to those involved. A safety advisor will be appointed to observe work practise and ensure WH&S regulations are strictly followed.

Professional Conduct. Vulgar language and discrimination are unacceptable in any workplace. While workers are in the public, there is zero tolerance for offensive language or discrimination of any sort as the community should not feel threatened. Any workers breaching this will be given a single warning, further breaches will result in termination of employment.

Protecting the Environment. We will ensure the responsible disposal of e-waste from our product by organising drop-offs to the Summerhill Waste Management Centre. This will ensure that the toxic e-waste materials such as lead, mercury and arsenic are not leached into the environment.

13.6 Present & Future Needs

The UONFO system was designed with sustainability in mind.

By using a slim design, we minimise impact on the area of implementation. Utilisation of solar panels, and power-saving, low light recognition software reduces UONFO's carbon footprint. With a focus on long-lasting and sustainable hardware our system is already environmentally friendly.

The agile development methodology we use will ensure that UONFO meets all present needs. Our in-built feedback system allows future needs to be voiced and implemented by any team that takes over the maintenance of UONFO.

14. Sign Off

This document establishes formal acceptance of all the deliverables for the UONFO project. The UONFO project has met all the acceptance criteria as defined in the requirements document and project scope statement.

Sponsor Acceptance

Approved by the project sponsor

	Date:
Mr. Stuart Morgan	
University Representative / Sponsor	

15. Appendices

15.1 Appendix A – Budget Summary

Budget Summary		
Expenditure description	Cost	Justification
Documentation		
Impact assessment	\$2,443	The initial document detailing the need and effect of the proposed system.
Communication plan	Included in below	Communication channels between the project manager and sponsors.
Project charter and initial modelling	\$1,764	Document explaining the system in detail.
Project management plan	\$5,091	Outlining the entire process.
User manual and system documentation	\$3,020	Documents for users and developers of the system.
Hardware		
Commercial display x25	\$42,075	Pre-built screens for user interaction.
Modular PC x25	\$6,575	The inner workings of the info board.
Safety container x25	\$105,700	Required so info boards are not vandalised or damaged by insects or weather.
Solar system x25	\$42,350	Allowing the system to not be hooked up to mains electricity.
Software		
Prototyping	\$16,970	Creation of a demo to show to sponsors and stakeholders.
UONFO system	\$50,910	The working software system.

Budget Summary, cont.

Contractors and external labour

Concrete foundation	\$6,250	A foundation to support the info boards.
Site preparation	Included in above	Clearing of area for foundation.
Component installation	\$10,182	Installing the info boards to the foundation.

Training and system use

System use presentation	Included	Demonstrating the system to stakeholders.
Online documentation and system use examples	\$1,320	Creation of documents for users and staff to reference.
Group training sessions x15	\$1,795	Training to provide knowledge to staff and some students.

Maintenance

Ongoing maintenance	\$40 per hour	Required to keep the system operational if any problems arise. Billed separately from project.
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TOTAL	\$296,445	
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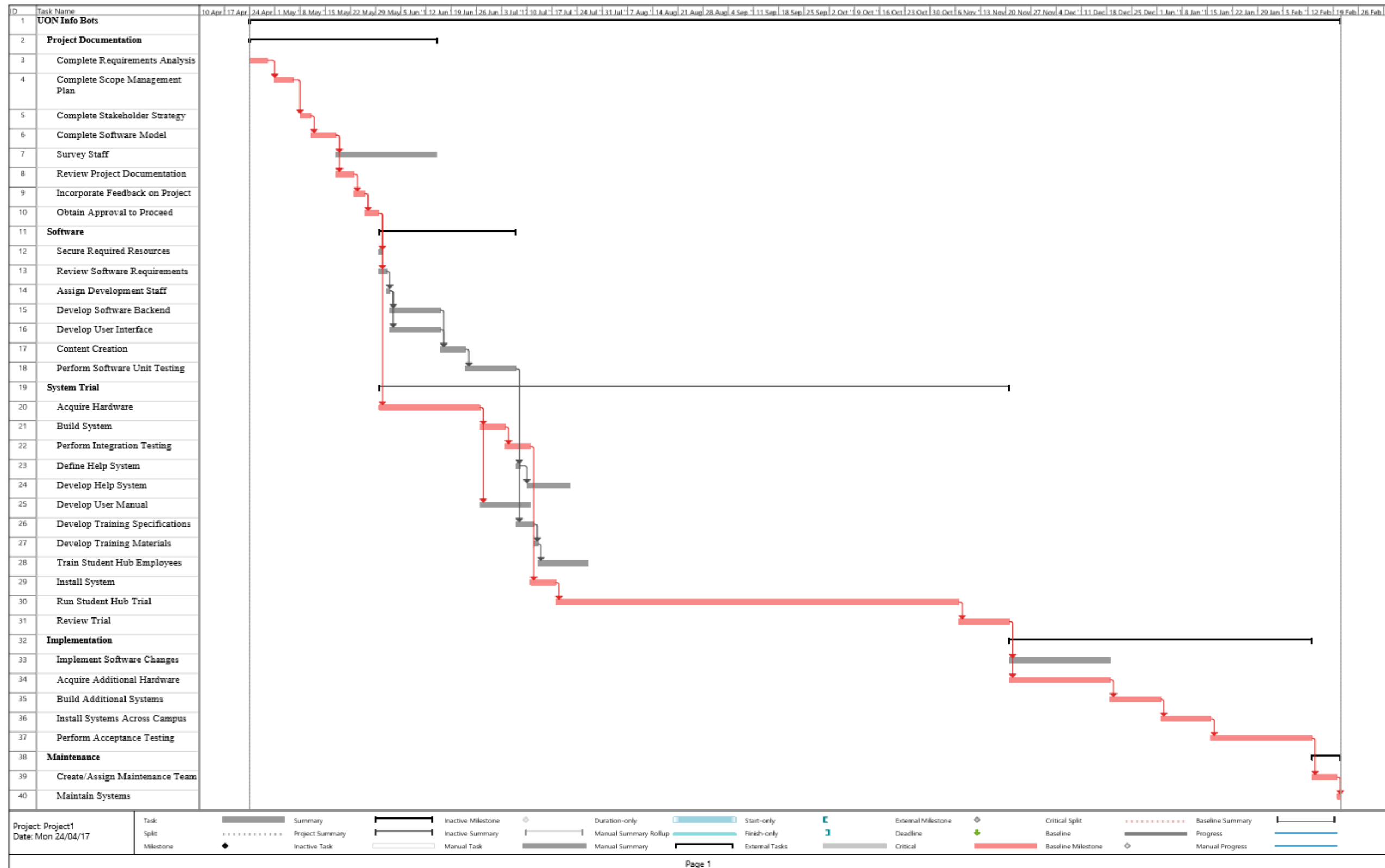
15.2 Appendix B – Key Stakeholders

Key Stakeholders		
Name	Role	Responsibilities
Prof. Caroline McMillen, Mr. Paul Dunn, Dr Michael Netherton	Executive Committee	<ul style="list-style-type: none"> • Approve or deny scope change requests as appropriate • Evaluate need for scope change requests • Approve change requests.
Mr. Stuart Morgan	University Representative/ Sponsor	<ul style="list-style-type: none"> • Approve or deny scope change requests as appropriate • Evaluate need for scope change requests • Accept project deliverables
Tim Pitts	Project Manager	<ul style="list-style-type: none"> • Quantify and validate project scope • Enable scope change requests • Partake in impact assessments of scope change requests • Organize and facilitate scheduled change control meetings • Communicate outcomes of change requests • Update project documents upon approval of all scope changes

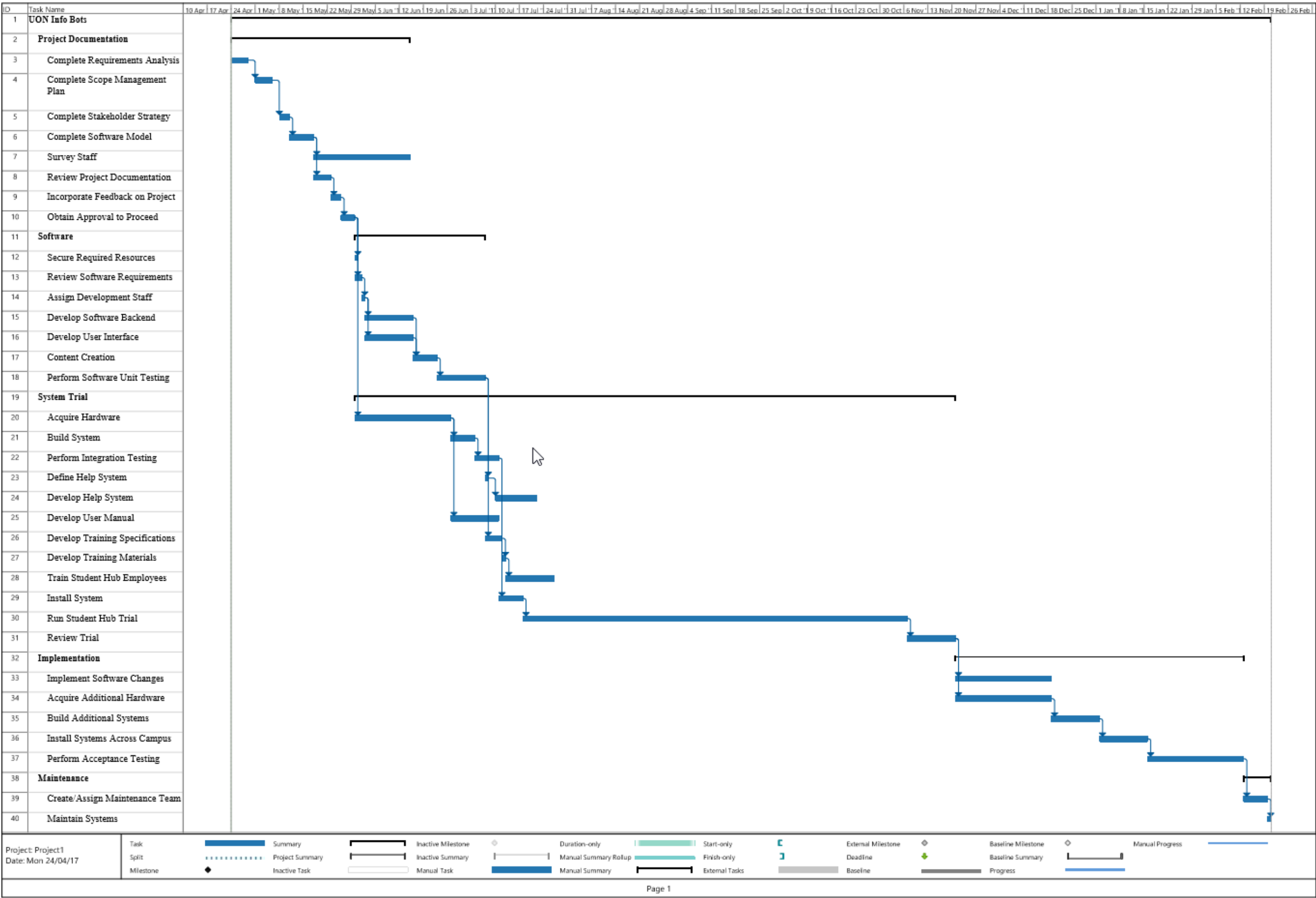
Key Stakeholders, cont.

Name	Role	Responsibilities
Tim Pitts	Team Lead	<ul style="list-style-type: none"> Quantify and validate project scope Validate scope change requests Partake in impact assessments of scope change requests Communicate outcomes of scope change requests to team Oversee team level scope change process
Scott Walker, Jack Ratcliffe, Blake Spiers, Zohaib Dawood	Team Member	<ul style="list-style-type: none"> Involved in defining scope changes Assess the requirement for scope changes and communicate them to the team lead as necessary
Tom Brown	Student Hub Employee	<ul style="list-style-type: none"> Participate in pre-development surveys Assess the requirement for scope changes and communicate them to the Team Lead as necessary
Mary Williams	Student	<ul style="list-style-type: none"> Participate in pre-development surveys

15.3 Appendix C - Critical Path



15.4 Appendix D - Gantt Chart



15.5 Appendix E – Requirements management matrix

Requirements management matrix		
Project Name	UONFO	
Project Manager	Tim Pitts	
Requirement Description	User Acceptance Validation	Comments
Reduce student HUB queues		
Integrated parking information		
Targeted event exposure		
Shuttle bus tracking		
Security and emergency assistance		
Provide frequently asked questions		
Provide multiple language support		
Provide text to speech		
Directions to important locations		
Course and program information		
System is dispersed		
Terminals are physically secure from environmental factors		
Terminals have surveillance to identify cause of deformation		

15.6 Appendix F - Activity list

Activity List					
Project: UONFO			Date: 26/04/2017		
ID	Name	Description of Work	Responsibility	Duration	Predecessors
1001	Complete Requirements Analysis	This activity consists of creating a detailed document on what the software should do and should not do.	Project Team	1 week	
1002	Complete Scope Management Plan	This activity consists of creating a document that describes the tasks needed to complete the project.	Project Team	1 week	1001
1003	Complete Stakeholder Strategy	This activity consists of creating a plan on how to increase support of stakeholders and decrease the negative outcomes.	Project Team	3 days	1002
1004	Complete Software Model	This activity consists of creating a set of use case, class, and all other important UML diagrams showing how the system will operate.	Project Team	1 week	1003
1005	Survey Staff	This activity consists of communicating with and surveying Student Hub employees to determine system components to add or improve.	Project Team / Student Hub Employees	1 month	1004

Activity List, cont.

Project: UONFO					Date: 26/04/2017
ID	Name	Description of Work	Responsibility	Duration	Predecessors
1006	Review Project Documentation	This activity consists of the meeting and reviewing the project documentation and identifying areas that need to be changed.	Project Team	3 days	1004
1007	Incorporate Feedback on Project	This activity consists of the project manager altering the project documents as defined in during the team review.	Project Manager	3 days	1006
1008	Obtain Approval to Proceed	The activity consists of the project manager sending the project documentation to the University representative for approval.	Project Manager/Project Sponsor	2 days	1007
1009	Secure Required Resources	This activity consists of the project managers acquiring necessary resources to develop the system software.	Project Manager	1 day	1008
1010	Review Software Requirements	This activity consists of the software development team reviewing the project documentation and the beginning of the agile software development process.	Project Team	2 days	1008

Activity List, cont.

Project: UONFO					Date: 26/04/2017
ID	Name	Description of Work	Responsibility	Duration	Predecessors
1011	Assign Development Staff	This activity consists of each project team member being assigned their role in developing the system software.	Project Manager/Project Team	1 day	1010
1012	Develop Software Backend	This activity consists of using an agile development method to create a functioning backend, that can be used for the system trial.	Project Team	2 weeks	1011
1013	Develop User Interface	This activity consists of using an agile development method to create a functioning user interface, that can be used for the system trial.	Project Team	2 weeks	1011
1014	Content Creation	This activity consists of filling the system with content as outlined in the requirements analysis.	Project Team	1 week	1012,1013
1015	Perform Software Unit Testing	This activity consists of testing the software in relation to the outlined software model.	Project Team	2 weeks	1014

Activity List, cont.

Project: UONFO			Date: 26/04/2017		
ID	Name	Description of Work	Responsibility	Duration	Predecessors
1016	Acquire Hardware	This activity consists of working with third party suppliers to have shipped to the university the necessary hardware for the systems to be used within the Student Hubs.	Project Manager	1 month	1008
1017	Build System	This activity consists of assembling the hardware and installing the relevant software to create a UON Info Bot.	Project Team	1 week	1016
1018	Perform Integration Testing	This activity consists of testing the installed systems in relation to the requirements analysis document.	Project Team	1 week	1017
1019	Define Help System	This activity consists of the project team defining the requirements for an in built, software help system.	Project Manager/Project Team	1 day	1015
1020	Develop Help System	This activity consists of the project team implementing the proposed help system into the system.	Project Team	2 weeks	1019

Activity List, cont.

Project: UONFO					Date: 26/04/2017
ID	Name	Description of Work	Responsibility	Duration	Predecessors
1021	Develop User Manual	This activity consists of the project team developing a user manual to compliment the in-built help system.	Project Team	2 weeks	1019
1022	Develop Training Specifications	This activity consists of the project team planning the training required for Student Hub employees.	Project Manager/Project Sponsor	3 days	1015
1023	Develop Training Materials	This activity consists of the project team producing any materials necessary for training.	Project Team	1 day	1022
1024	Train Student Hub Employees	This activity consists of teaching Student Hub employees how to use the systems, to help users if necessary.	Project Team/Student Hub Employees	2 weeks	1023
1025	Install System	This activity consists of installing the built systems into the Student Hubs.	Project Team	1 week	1018
1026	Run Student Hub Trial	This activity consists of monitoring the installed systems and collecting metadata over a semester.	Project Team	4 months	1025

Activity List, cont.

Project: UONFO					Date: 26/04/2017
ID	Name	Description of Work	Responsibility	Duration	Predecessors
1027	Review Trial	This activity consists of analysing and evaluating the system trial and defining any necessary changes to the system for the proposed campus wide implementation.	Project Team/Stakeholders	2 weeks	1026
1028	Implement Software Changes	This activity consists of implementing the identified changes and preparing the system for wide spread installation.	Project Team	1 month	1027
1029	Acquire Additional Hardware	This activity consists of working with third party suppliers to have shipped to the university the necessary hardware for the systems to be used across the campus.	Project Manager	1 month	1027
1030	Build Additional Systems	This activity consists of assembling the assembling the newly acquired hardware.	Project Team	2 weeks	1029
1031	Install Systems Across Campus	This activity consists of dispersed installation of UON Info Bots around campus.	Project Team	2 weeks	1030

Activity List, cont.

Project: UONFO					Date: 26/04/2017
ID	Name	Description of Work	Responsibility	Duration	Predecessors
1032	Perform Acceptance Testing	This activity consists of testing and reviewing the systems in relation to the outlined requirements analysis document.	Project Team/Project Sponsor	4 weeks	1031
1033	Create/Assign Maintenance Team	This activity consists of assigning a team to perform regular maintenance on the systems, post installation.	Project Manager/Project Team	1 week	1032
1034	Maintain Systems	This activity consists of updating the systems with new content, features as necessary and repairing any damaged systems across campus.	Project Team	1 day	1033

15.7 Appendix G – Risk register key terms

Risk: The risk stated in a complete sentence which states the cause of the risk, the risk, and the effect that the risk causes to the project.

Risk Category: Categorization of risks by area of project affected, source of risk, or other useful category.

Probability: The likelihood that a risk or opportunity will occur (on a scale from 0 to 10 with 10 being the highest).

Impact: The impact of the risk on the project if the risk occurs (scale from 0 to 10 with 10 being the highest).

Risk Level: Determined by multiplying probability and impact (scale from 0 to 100) and applied to impact / probability table.

Risk Ranking: A priority list which is determined by the relative ranking of the risks (by their scores) within the project with the number one being the highest risk score.

Risk Response: The action which is to be taken if this risk occurs.

Trigger: Something which indicates that a risk is about to occur or has already occurred.

Risk Owner: The person who the project manager assigns to watch for triggers, and manage the risk response if the risk occurs.

15.8 Appendix H – Risk register

Table 10.1 Risk register sorted by risk level.

Risk Register								
Risk Identification		Qualitative Rating				Risk Response		
Risk	Risk Category	Prob. (/10)	Impact (/10)	Risk Level	Risk Ranking	Risk Response	Trigger	Risk Owner
Disruption to surrounding areas during installation	Installation	7	6	46 (H)	1	Cannot prevent disruption due to nature of the task. Provide alternate paths for access.	Required detours during installation	Project Manager
System hack during testing	Testing	3	10	30 (H)	2	Use advanced encryption standards; restore project through external backups	Signs of malicious activity; access logs	Developer
People entering work zone.	Installation	5	6	30 (H)	3	Safety fencing to be set up around perimeter	Equipment accessible to public	Project Manager
Connection loss from the University Network	Network	3	10	30 (H)	4	Display “No Connection”; email administration staff on terminal to inform users that the system is down.	Connection is lost between terminal and host server	Developer
Damage to existing infrastructure during installation	Installation	3	8	24 (M)	5	Full inspection of damaged infrastructure	Damage occurring because of operations	Project Manager
Consistent inclement weather preventing laying of foundation	Installation	6	4	24 (M)	6	Marquee or alternate temporary weather prevention; delay project for weather	No break in inclement weather	Contractor
Delays in hardware	Supplier	2	8	16 (M)	7	Alternate supplier; remediation from supplier due to delay	Notification from supplier	Project Manager
Student HUB system trial shows insignificant benefit from system	Testing	2	8	16 (M)	8	Consider termination of project	Feedback from testers; no evidence of change in HUB queue times	Project Manager
Project team not authorised to install software system	Development	2	7	14 (M)	9	Contact campus IT staff and discuss requirements for authorisation	Project team rejected from implementing software on campus servers	Developer
Project team member leaves	Development	4	3	12 (M)	10	Redistribute workload; hire additional team member	Project team member leaves	Project Manager
Insufficient feedback from system trial	Testing	3	4	12 (M)	11	Advertise system to ensure awareness; implement mandatory feedback from users	Less than 100 feedback results within a month period	Project Manager

Table 10.2 Risk register sorted by risk level, cont.

Risk Register								
Risk Identification		Qualitative Rating				Risk Response		
Risk	Risk Category	Prob. (/10)	Impact (/10)	Risk Level	Risk Ranking	Risk Response	Trigger	Risk Owner
Supplied hardware did not meet system specifications	Supplier	1	10	10 (L)	12	Contact supplier to source a replacement	Received hardware does not match requested purchase	Project Manager
University withdraws support	Supplier	1	10	10 (L)	13	Renegotiate project deliverables; terminate project due to withdrawn support	University withdraws support	Project Manager
Defects in supplied hardware	Supplier	1	9	9 (L)	14	Contact supplier to source a replacement	Received hardware has a defect	Project Manager
Loss of project data	Development	1	8	8 (L)	15	Recovery of documents through version control software; restore lost data via backups	Software development is halted due to loss or corruption of data	Developer
Supplier goes into administration and cannot supply hardware	Supplier	1	8	8 (L)	16	Attempt remediation of funds; source a new supplier	Supplier informs of bankruptcy or similar	Project Manager
No support to trial system in Student HUB	Testing	1	6	6 (L)	17	Create temporary web-based platform for students to test	University rejects access to Student HUB locations	Developer

15.9 Appendix I – Communications Matrix

Communication Type	Objective of Communication	Medium	Frequency	Audience	Owner	Deliverable	Format
Kickoff Meeting	Introduce the project and review project objectives.	• Face to Face	Once	• Project Sponsor • Project Team • Stakeholders	Project Manager	• Agenda • Meeting Minutes	Everything archived on the online drive and website.
Technical Design Meetings	Discuss and generate technical designs for the project.	• Face to Face	When Required	• Project Manager • Project Team	Technical Lead	• Agenda • Meeting Minutes	Everything archived on the online drive and website.
Project Team Meetings	Review status of the project with the team.	• Face to Face • Conference Call	Weekly	• Project Team	Project Manager	• Agenda • Meeting Minutes • Project schedule	Everything archived on the online drive and website.
Monthly Project Status Meetings	Report on the status of the project back to senior management.	• Face to Face • Conference Call	Monthly	• Project Sponsor	Project Manager	• Meeting Minutes • Project schedule	Everything archived on the online drive and website.
Project Status Reports	Report the status of the project to everyone. This includes activities, progress, costs, and issues.	• E-mail	Monthly	• Project Sponsor • Project Team • Stakeholders	Project Manager	• Project Status Report • Project schedule	Everything archived on the online drive and website.

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