Disaster Reactor

Project Management Document
CSC 4330

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Sam Shrestha, Zachary Smith, Nealan Vettivelu

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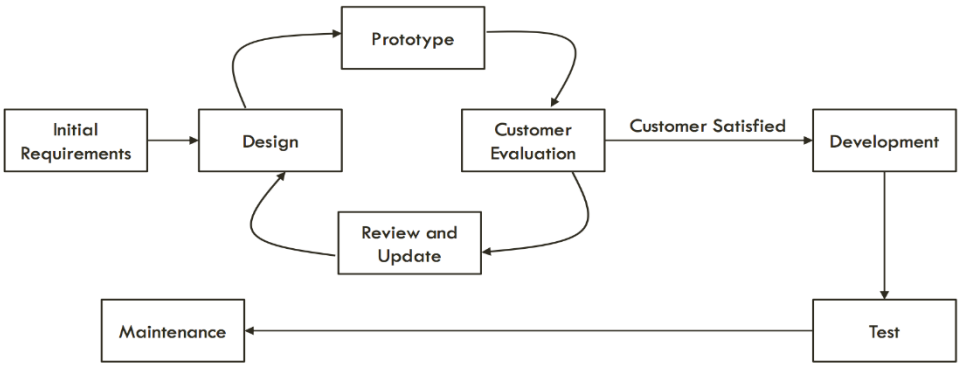
1 Vision

It is our vision to provide users residing in any part of the world with a time and cost efficient solution to determine distribution/evacuation paths that is simple to use and operates without network connection in the event of a disaster. By utilizing modern computing power, our software will aid in rescue efforts around the world.

2 Software Process Model



The process model we decided to use was the Prototype Model. The reason we selected prototype to be our process model is so that we can go back and reiterate through the overall system design and requirements.
The approach we used to prototyping is the Evolutionary Approach, this way we can solve questions about certain designs of our GUI and AI but still benefit from it by reusing the code.

3 Process Model Configuration Management Plan

Thanks to modern technology, we were able to communicate frequently by using applications such as Facebook messenger, OneDrive, and GitHub, which allowed us the freedom to collaborate on Disaster Reactor remotely.
Facebook messenger was our chosen medium to communicate directly with one another about project related matters. We utilized the group messaging feature which enabled us to communicate to the entire group all at once.
We used OneDrive to store and share all documentation. This enabled us to hold virtual meetings and work on the documents together around our personal schedules and achieve more in a timely manner.
We used GitHub to manage our code. This was a great way for us to work together, separately and keep track of all the changes being made. Each coder created their own branch allowing the coders to code free from fear of overwriting each other's code. We ran into some technical difficulties when merging sometimes, but we learned a good bit from the GitHub experience.
We also held weekly group meetings at the Student Union to discuss project goals and get help from other group members on various project related matters.

Our repository can be found at: https://github.com/Sciencegeek123/LSU4330_DisasterReactor

4 Deliverables

4.1 Code Documentation

When someone receives our software the source code will be provided. With that other developers can expand upon our product to make it more suitable for their individual needs. Our internal documentation is going to make the process of expanding our product easier. Our code documentation includes the following:

4.1.1 Header Comments

- This will help future developers of our software to easily identify a certain component of code and how it fits in with the system as a whole

4.1.2 Method Comments

- This will help future developers understand the functionality of methods

4.1.3 Meaningful variable names

- The variable names in our code will have meaningful names to help future develops with variables

4.2 Video Tutorial/User Manual

There will be two options for supplementary information given when software is delivered: video tutorials and the user manual. The video tutorials will be a walkthrough of how to correctly use all parts of the application. Users can easily access the tutorials in the document folder. The user manual will serve the same purpose as the video tutorials while also offering the user a choice to learn more about the software in a readable format and providing in-depth technical documentation.

5 Potential Risks

5.1 Human Risks

A risk that stems from users is not using the program correctly and getting a wrong simulation leading to the users conducting the wrong recovery strategy. To help minimize human risks, we have provided manuals and detailed How To videos explaining the different parts of the software.

5.2 Time Risks

Since this is a school project our time constraints are very important to keep in mind. To alleviate some of the stress of deadlines we have regular meetings to discuss deadlines and our current progress.

5.3 Resource Risks

Since this program is intended to aid with disaster relief around the world, advanced computer hardware may not be available to some users. For this, we have designed this software to rely on as little hardware as possible.

5.4 Security Risks

The biggest risk however is if this software has been developed, but is kept out of the public view for security reasons. In such a situation, we will have extreme difficulty competing, as our software may be seen as a security risk. Even more devastating would be if our software has similar results, but is used for nefarious purposes.

5.5 Liability Issues

The output of the software depends highly on the input. If inaccurate data is used for input the program may return inaccurate paths. Disaster Reactor is not liable for such an occurrence; however, in the event that accurate data is used and the user follows all guidelines as documented in the User Manual and Video Tutorials, if inaccurate paths are returned Disaster Reactor accepts liability.

6 Team Members (Names, Tasks, Team Style)

6.1 Names and Tasks

For this project we formed a team with different personnel. We made sure that all of our team members were chosen for the benefit of our project.

6.1.1 Project Managers:

For this project we had two project managers that shared responsibilities. The main tasks of a Project Manager were as follows: Ensuring all meetings have a solid purpose and are effective, completing documentation for the project and keeping track of all deadlines and ensuring all team members are made aware.

- Amanda Alfaro (Skills: Organization, time management, documentation, coding)
- Sam Shrestha (Skills: organization, time management, communication, coding)

6.1.2 Artificial Intelligence Programmers:

Our two AI programmers were responsible for enhancing and improving the existing AI in the Disaster Reactor.

- Craig Jones (Skills: Coding, AI, communication)
- Nealan Vettivelu (Skills: Coding, AI)

6.1.3 Graphical User Interface Programmers:

Our two GUI programmers were responsible for designing and implementing a GUI that is user-friendly.

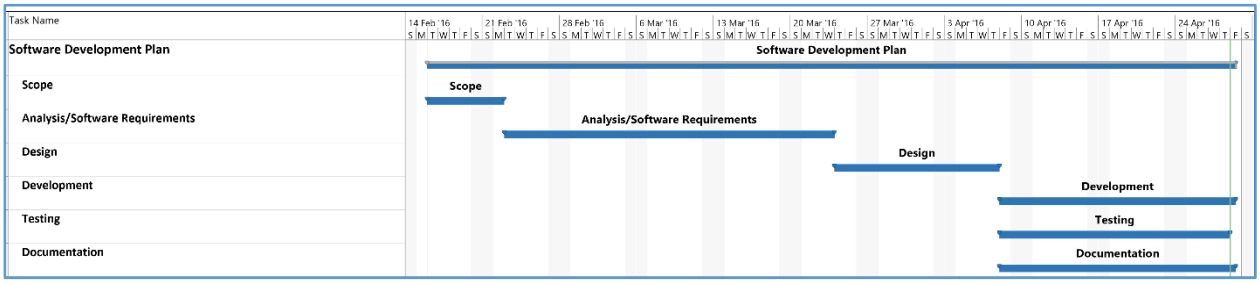
- Khaleel Harris (Skills: Coding, internal documentation)
- Zachary Smith (Skills: Coding, documentation)

6.2 Team Style:

Our team style approach for this project is an Egoless approach, where all users are equally responsible for their important individual task. Although everyone was responsible for their own tasks, we all helped out where needed to ensure we completed the project according to schedule.

7 Project Schedule

7.1 Gantt Chart



7.2 Milestones

7.2.1 MS1

- Date: 4/27/2016
- Description: Completion of the Graphical User Interface

7.2.2 MS2

- Date: 4/28/2016
- Description: Completion of System Integration and Testing of the Graphical User Interface and the System features

7.2.3 Alpha Build

- Date: 4/28/2016
- Description: Completion of System and Integration testing

7.2.4 Beta Build

- Date: To be determined once product can be tested for path accuracy
- Description: Conclusion of performance and safety testing and documentation to come.

7.2.5 Release

- Date: To be determined once product can be tested for path accuracy
- Description: All testing will be concluded. Documentation and deliverables will be finalized and packaged.

7.3 Rough Estimates

Tasks	Owners	Pessimist	Most Like	Optimist	PERT Resu	Total for Subsystem
Program structure						**19.33**
Comment and reorganise code	WCJ	24.00	12.00	6.00	13.00	
Add in event handling	WCJ	6.00	3.00	1.00	3.17	
Add in error handling	WCJ	6.00	3.00	1.00	3.17	
GUI subsystem						**2.48**
Implement base class	KH	3.00	2.00	1.00	2.00	
Button class	KH	1.00	0.40	0.25	0.48	
Information pane class	KH	1.00	0.40	0.25	0.28	
Input system						**8.23**
Verify importing works	WCJ	12.00	6.00	2.00	6.33	
Implement gui buttons in input panel	KH	1.00	0.40	0.25	0.48	
Handle data compression + preparation	WCJ	4.00	1.00	0.50	1.42	
Simulation subsystem						**33.78**
Expand the filters on the view	KH	15.00	10.00	3.00	9.67	
Implement button print simulation	KH	25.00	20.00	10.00	19.17	
Implement button end simulation	KH	0.40	0.30	0.10	0.28	
Expand data recording for output	KH	5.00	2.00	1.00	2.33	
Package the data for the output stage	KH	5.00	2.00	1.00	2.33	
						Total
						63.82

7.4 Weekly Schedule

Each week we met up to discuss different aspects of the project. There is further information on what we specifically went over each week in Section 8 Meeting Summaries. We had a list of goals that needed to be met for the next meeting or for the next documentation due date. The project managers, Sam and Amanda, would do weekly meeting follow-ups to ensure we stay on our planned schedule. Each week matches up to each meeting we conducted.

Week 1: Feb 21st - Feb 27th
Goal: Understand Disaster Reactor and its vision; work on first presentation; pick a process model and team style

Week 2: Feb 28th - March 5th
Goal: Finalize what deliverables we will provide with our software; reach an agreement on how the GUI will look/operate; make sure all team members dealing with AI understand what needs to be improved upon

Week 3: March 13th – March 19th
Goal: Finalize our GUI drawings and decide on which one we will be using; finish a basic draft of the Software Requirements Specification Document

Week 4: March 27th - April 2nd
Goal: Create template of Software Design Document; update Project Management Document; discuss our GUI prototype

Week 5: April 10th - April 16th
Goal: Update the Project Management Document (meeting summaries, project schedule); move on to next GUI prototype

Week 6: April 17th - April 23rd
Goal: Start and finish Software Testing Document; make a rough draft of presentation slides for presentation on Tuesday, April 26th

Week 7: April 24th- April 30th
Goal: Complete Software Testing Document by Tuesday, April 26th; finalize presentation slides and review our parts before presentation; finish internal code documentation by Thursday April 28th to turn in link to GitHub on Friday, April 29th

7.5 Estimation Method PERT

Estimating the project is crucial for project planning. Therefore, this needs to be done as early as possible in the software development process. Since this is an egoless team style, we are all qualified to make estimations.

We decided to use the Three Point Estimation method (also known as PERT) because we found no benefit from having a coordinator assign a specification along with an estimation form. We made 3 predictions each: Pessimistic, Most likely, and Optimistic for the overall program structure and the subsystems in our program. Below is a detailed chart on who completed what estimation and their total calculations based on their predictions.

8 Meeting Summaries

We met weekly to discuss multiple topics dealing with our project. We had objectives for every meeting to ensure that the meeting was productive and informative. During the meetings we either had a specific note taker or recorded the meeting to review for writing the Meeting Summaries. Each meeting we started off with follow-ups to check up on each team member. Throughout the week we also had Sam and Amanda do follow-ups on meeting discussions mid-week.

8.1 First Meeting

Date / Time / Location: 26 February 2016 / 10 am / Student Union

Members	Attended?
Amanda	Y
Craig	Y
Sam	Y
Khaleel	Y
Nealan	Y
Zachary	N

Objectives

- Form a general plan of action
  - Discuss timelines and responsibilities
  - Discuss project organization
  - Outline main objectives
  - Project vision
  - Process model

Summary

For the first meeting, Sam and Craig explained what their project was and where they wanted to go this semester with the project. Other members asked questions to get clarity on the project. Once everyone got a clear and solid understanding of the project we discussed what type of project organization we would be following and decided on an egoless approach. We then discussed what process model we were used and all decided on prototyping since it was the most reliable for our type of project. The next important thing was to determine the responsibilities of each team member. Since Craig was most familiar with the current AI of the program he chose Nealan to help him improve the AI. Sam and Amanda were very great with organization and did most of the documentation from the previous semester so their role was to be a project manager. We decided that since the workload may be heavy, Amanda and Sam will help with any programming where needed. Zachary and Khaleel's role was to completely redesign the current graphical user interface to make the simulation user friendly. Towards the end of the meeting set up our forms of communication (Facebook messenger), made sure everyone was added to the OneDrive folder where we would be editing all of our documents, and setting

8.2 General Meeting

Date / Time / Location: 04 March 2016 / 9:30 am / Student Union

Members	Attended?
Amanda	Y
Craig	Y
Sam	Y
Khaleel	Y
Nealan	Y
Zachary	Y

Objectives

- Discuss possible deliverables for the user
- Discuss how GUI should be developed to make it user-friendly
- Leave the meeting with ideas of how GUI should look

Summary

We first answered any questions anyone had, particularly Nealan had a question about the AI. After that we discussed the type of deliverables we will provide for the user. We came up with the idea of having a user manual and short video clips explaining in detail about the different features of the system and how to use them properly. But we will put more focus on the user manual. We discussed with Khaleel and Zach the importance of the GUI and provided additional ideas of how GUI should look.

8.3 General Meeting

Date / Time / Location: 18 March 2016 / 9:45 am / Student Union

Members	Attended?
Amanda	Y
Craig	N
Sam	Y
Khaleel	N
Nealan	Y
Zachary	Y

Objectives

- Review GUI sketches and discuss the pros and cons
- Discuss SRS Document deadline
- Determine who will be working on what part of SRS Document

Summary

We reviewed the GUI sketches that were drawn by Khaleel and Zach. Since Zach's layout was more convenient we used his layout. Khaleel's drawing had nice buttons so we merged Khaleel and Zach's drawings.

The next topic of discussion was the Software Requirements Document. We discussed 4 major topics:

1. Due Date
    i. Wednesday, March 23, 2016, 11:55 PM
    ii. Every group member needs to submit a copy through Moodle
2. Who is working on what section of the SRS Document
    i. Sam - Introduction, Overall Description
    ii. Amanda - Overall Description, Introduction
    iii. Craig - System Features, Overall Description
    iv. Khaleel - External Interface Requirements
    v. Zach - External Interface Requirements
    vi. Nealan - System Features, Other Nonfunctional Requirements
3. When to have the SRS Document completed
    i. Sunday, March 20, 2016, 12 AM (So we can send to Nash for feedback)
4. Any questions pertaining to the SRS Document
    i. None at meeting but Facebook message if anyone runs into problems

8.4 Virtual Meeting

Date / Time / Location: 02 April 2016 / 10pm / Virtual Meeting through Facebook

Members	Attended?
Amanda	Y
Craig	Y
Sam	Y
Khaleel	Y
Nealan	Y
Zachary	Y

Objectives

- Check up on GUI ideas and GUI prototype
- Discuss Software Design Document

Summary

We talked with Khaleel and Zach on the GUI and if the prototype was working properly. They had a few issues but are still working on them. The next topic of discussion was the Software Design Document. We discussed 4 major topics:

1. Due Date
    i. Thursday, April 7, 2016, 11:55 PM
    ii. Every group member needs to submit a copy through Moodle
2. Who is working on what section of the SDD
    i. Sam - Work- Assignment View, Element catalog
    ii. Amanda – Cover Page, User Interface
    iii. Craig - Development View, Technical System Architecture
    iv. Khaleel - User Interface
    v. Zach - Introduction
    vi. Nealan - Rationales for Choices, Work- Assignment View, Physical View, Data View
3. When to have the SDD completed
    i. Wednesday, April 6, 2016, 12 AM
4. Any questions pertaining to the SDD
    i. None at meeting but Facebook message if anyone runs into problems

8.5 Project Management Meeting

Date / Time / Location: 14 April 2016 / 11 am / Tureaud Hall

Members	Attended?
Amanda	Y
Craig	N
Sam	Y
Khaleel	N
Nealan	N
Zachary	N

Objectives

- Discuss the format of the Project Management Document
- Review Project Management Document thus far and discuss what needs to be done

Summary

Sam and Amanda got together before class to discuss the Project Management Document. We came up with a nice format for the document since at this point we didn't have a clear document design. Amanda also introduced her idea of the logo for Disaster Reactor. More information on the Project Management Document:

1. Due Date
    i. Friday, April 29, 2016, 11:55 PM
    ii. Every group member needs to submit a copy through moodle
2. Who is working on what section of the Project Management Document
    i. Sam - Vision (What is the ultimate goal of this project), Configuration management plan, Meetings summaries, Project schedule, Process model used
    ii. Amanda – Cover Page, Deliverables, Potential risks, Team members, Project schedule, Meetings summaries
3. When to have the Project Management Document completed
    i. Thursday, April 28, 2016, 12 AM
4. Any questions pertaining to the Project Management Document
    i. None at meeting but Facebook message if anyone runs into problems

8.6 General Meeting

Date / Time / Location: 20 April 2016 / 9:30 am / Student Union

Members	Attended?
Amanda	Y
Craig	Y
Sam	Y
Khaleel	Y
Nealan	Y
Zachary	Y

Objectives

- Discuss Software Testing Document

Summary

This meeting was dedicated to the understanding of the Software Testing Document.

1. Due Date
    ii. Tuesday, April 26, 2016, 11:55 PM
    iii. Every group member needs to submit a copy through moodle
2. Who is working on what section of the STD Document
    i. Sam - Introduction, Test Plan Identifier, Features Not to Be Tested
    ii. Amanda – Cover Page, Approach, Environmental Needs, Responsibilities, Risks and Contingencies
    iii. Craig - System Features Tests (Simulation and Output Tests)
    iv. Khaleel - Graphical User Interface Tests
    v. Nealan - System Features Tests(Simulation and Input Tests)
    vi. Zach - Graphical User Interface Tests
3. When to have the Software Testing Document completed
    i. Tuesday, April 26, 2016, 11:55 PM
4. Any questions pertaining to the STD Document
    i. None at meeting but Facebook message if anyone runs into problems

8.7 General Meeting

Date / Time / Location: 24 April 2016 / 8 am / CC's Coffee

Members	Attended?
Amanda	Y
Craig	Y
Sam	Y
Khaleel	N
Nealan	Y
Zachary	Y

Objectives

- Discuss upcoming deadlines
    - Software Testing Document
    - Project Management Document
    - GitHub Link
- Prepare for presentation

Summary

The first important topic we discussed was deadlines.

What is due?:

- Tuesday 26th: Presentation day, Software Testing Document
- Friday 29th: Project Management Document, GitHub link

Software Testing Document: Still having issues trying to merge code on GitHub but hopefully will resolve before due date. Craig, Nealan and Khaleel discussed how they were going to resolve the problems and will check back with the problem by the end of the next day.

Presentation: Presentation slides are finished; just need to review how the flow will work

Project Management Document: We have a detailed rough draft of the project management document but we still need to work on the project schedule section as well as the configuration management plan.

GitHub link: Some internal documentation has been completed but not all. We will aim to complete the internal documentation by Thursday April 28th.

The second important topic we discussed was our presentation.

We each discussed what we wanted to present and the order we should present it in. Amanda also showed us the presentation slides and from there we edited the bullet points/ pictures to fit what we were going to say.

8.8 General Meeting

Date / Time / Location: 25 April 2016 / 6 pm /Student Union
Attendees

Members	Attended?
Amanda	Y
Craig	Y
Sam	Y
Khaleel	Y
Nealan	Y
Zachary	Y

Objectives

- Prepare for presentation

Summary
We went over a couple of problems with the demo and corrected them. We all reviewed and made our final changes to the PowerPoint presentation (adding/removing/replacing bullet points, adding/removing/replacing pictures). After we finalized the slides we went through the presentation in the flow of the presentation for class. We talked about the Software Testing Document and what we had left.

8.9 Last Meeting

Date / Time / Location: 26 April 2016 / 10 am / Tureaud Hall

Members	Attended?
Amanda	Y
Craig	Y
Sam	Y
Khaleel	Y
Nealan	Y
Zachary	Y

Objectives

- Prepare for presentation
- Make sure demo runs smoothly

Summary
All of us went over what we were going to say for the presentation. We also ran through the demo to make sure it ran properly with no errors. We went over example questions we might get asked after the presentation.