THE UNIVERSITY
of ADELAIDE

SUB CRUCE LUMEN

Software Project Management Plan

for

Archaeology Robot
Team 13

Yufeng Bai 1600095	
Jun Chen 1206265	
Dawei Geng 1219181	
Yunyao Yao 1203525	
Shikai Li 1214223	
Quang Khoi Nguyen 1187070	
Yatong Zhou 1204471	

Version 0.1

August 27, 2012

Contents

Revision History

Name	Date	Reason For Changes	Version
Dawei Geng	21 Aug 2012	basic framework of the SPMP and Chapter 1	0.1
Dawei Geng	23 Aug 2012	Chapter 3 & Section 4.1	0.19
Dawei Geng	24 Aug 2012	Section 4.2.1 & 4.2.2	0.2
Dawei Geng	25 Aug 2012	Chapter 5	0.3
Jun Chen	25 Aug 2012	Spelling and grammar check , error fix	0.31

Chapter 1

Introduction

1.1 Purpose and Scope

This document is aim to provide information that are required to manage the overall design, implementation, maintenance of the project of archaeology robot.

This document will be divided in to seven parts, including the Introduction, Definitions, Project organization, Risk management plan, Process model, Work plan, and the Supporting plans.

1. **Project organization** describes the responsibilities for each member of the team and the reason behind this arrangement.

2. **Risk management** outlines the risks may be found during the development of the project, also includes risk analysis and the processes and strategies for the team members to control or overcome these risks.

3. **Process model** describes the process model will be used throughout the whole development. Including the critical paths and major stages taken in the development. Rational behind this choice will be provided, along with the advantages and disadvantages of this process model.

4. **Work plan** includes the tasks will be done to deliver the product, and the milestones that the team will be meeting during the development. Work plan will also includes the duration of the tasks and the allocation of the resources to these tasks.

5. **Supporting plan** outlines the configuration management plan, the documentation plan, and quality assurance plan.

1.2 Assumptions and constraints

This project will be developed under such assumptions and constraints:

1. All the team members will have a computer which is installed LejOS.

2. All the team members' PC will have a JAVA RE and SDK.

3. All the team members will have access to the group's SVN repository.

4. A Bluetooth connection can be created between the robot and every team member's PC.

5. A Lego Mindstorm NXT robot will be used in this project.

6. This project has a duration of 11 weeks.

7. This project will require at least 10 hours per week workload for each team member.

1.3 Project deliverables

The following items will be delivered to the client throughout the development of this project.

1. Team Poster

2. Software Requirement Specification (SRS)

3. Software Project Management Plan (SPMP)

4. Software Design Document (SDD)

5. Testing Report

6. User Manual

7. Project Milestone Demonstration

8. Final Project Demonstration

1.4 Evolution of the plan

This plan will be made by the team during the requirements elicitation and system design. The plan shall be made by gathering the feedback from the clients, and negotiation with clients about the milestones. In the software developing stage, the plan shall be changed under such circumstances:

1. Requirements changed by the clients

2. A defect of the plan was found

3. Other unexpected situations

At the planning stage, clients shall be able to change or raise requirements at anytime. However once the plan have been made and the team enter the developing stage, if a change is needed, the clients shall negotiate with the project manager along with team members to achieve the changes.

If a defect of the plan was found. It will be raised in the group meetings and the whole team shall discuss and respond to the possible changes.

Other unexpected situations such as team member missing and damaged hard drives, will lead to the whole team meeting with the client to discuss how to overcome such situations.

Chapter 2

Reference

Chapter 3

Definitions

Acronym	Definition
Gantt Chart	A type of bar chart, which illustrates a project schedule.
GUI	Graphic User Interface
LaTeX	Document markup language for TeX typesetting program
QA	Quality assurance
SEP	Software engineering project
SPMP	Software Project Management Plan
SRS	Software Requirements Specification
SVN	Subversion repository
TeX	A system for computer typesetting. Used by LaTeX
XML	Extensible Markup language

Chapter 4

Project organization

4.1 Roles and responsibilities

The team for this project has seven people, which will divide into project manager, documentation manager, QA manager, developer, and QA engineer. Each team member will have one or two specific role, however, a team member will not have to be limited to his role and be able to help others. In this chapter, each role's main responsibilities will be explained and the team members who assigned to the role will be listed.

Role: Project Manager

Member: Dawei Geng

Responsibilities:

1. Ensure the goal of this project to be achieved and client's satisfaction.

2. Develop project milestones and overall project plan.

3. Organizing team members and their roles to fulfill the project needs.

4. Ensure the project runs according to the milestones and project plan.

Rational:
Being a project manager requires leadership, team spirit, problem solving skills, and much more. Dawei Geng have worked in groups and stood out when a plan is needed for the project. In case of leadership, team working, and project planning, Dawei Geng did a very nice job.

Role: Documentation Manager

Member: Yufeng Bai

Responsibilities:

1. Organizing the project's documents and keeping documents up to date.

2. Help project manager organizing meeting agendas and minutes.

3. Keep tracking and updating the SVN repository.

4. Spelling and grammar checking.

Rational:
As a documentation manager Yufeng Bai must take full responsible for all the document changes and delivery, this job requires responsibility and professional English skills to manage the documents. Yufeng Bai meets certain requirements.

Role: QA Manager

Member: Nugyen Khoi

Responsibilities:

1. Planning, organizing all the test-related tasks

2. Setting up the test strategies

3. Reviewing the code and test plans with QA engineers.

Rational:
Being a QA manager, besides of being a good QA engineer, it requires additional skills such as communication, creativity, and certain skills of team management. Nugyen Khoi can be a qualified QA manager.

Role: Main Developer

Member: Nugyen Khoi, Yatong Zhou, and Yaoyun Yao

Responsibilities:

1. Develop the software of the robot and the host machine based on the requirements.

2. Follow the reset milestones and project plan.

3. Deliver high quality code and software.

Rational:

Role: GUI Developer

Member: Yatong Zhou and Shikai Li

Responsibilities:

1. Developing the graphic user interface.

2. Provide test GUI to the main developers.

Rational:
Yatong Zhou and Shikai Li have great experiences of developing graphic user interface using Java and understand the concept of presenting the useful information to the user in a elegant, efficient way.

Role: QA Engineer

Member: Shikai Li and Jun Chen

Responsibilities:

1. Be responsible for all the test-related tasks.

2. Follow the testing plans.

3. Code reviewing.

4. Writing test report.

Rational:

4.2   Risk management plan

4.2.1   Purpose

Risk is defined as the events which occurred during the development of the project, and could have positive or negative impact to the development. A certain risk may be caused by one or more causes and may have one or more impacts. This plan document's processes, tools, and procedures will be taken to manage or control the events which could have negative effect to the project. It will include:

1. Foreseeable Risks Identification.

2. Risk's Impact Prediction.

3. Risk's Likelihood Prediction.

4. Risk Response Plan.

As summary, this plan will list each identified risk based on the priority: the likelihood of certain risk and the impact of it. A plan in which to reduce the risk from occurring will be suggested.

4.2.2   Risk Assessment

This section will list each identified risk and give it a ID initialed with letter "R". The probability and the impact of each risk will be represented as the category of "Low", "Medium", and "High".

R001: Team member unable to work   **Probability:** High   **Impact:** Medium

Description   As a three months project, team members who get sick or has personal affair which unable to perform enough work, someone else in the team will have to double the workload.

Indicator   A team member does not attend to the lecture and the meeting with no work submitted for over one week or call for absence.

Mitigation   All the work shall be evenly assigned. Team members should pay attention to themselves healthy condition.

Response Plan   Divide missing team member's work into pieces and assign them to others.

R002: Team member leave permanently   **Probability:** Low   **Impact:** High

Description   Due to possible reasons, one team member may withdraw himself form team permanently.

Indicator   The team member notify the team with certain intention.

Mitigation   The importance of each team member's work shall be roughly the same, means on one responsible for the overly important job.

Response Plan   An emergency meeting will be held within the group to reassign the leaving member's work.

R003: Conflict within the team   **Probability:** Medium   **Impact:** Low

Description   Argument or conflict between team members about the developing or design.

Indicator   Team members are arguing or refusing to complete their tasks.

Mitigation   Every issue regarding the design or implementation of this project will be discussed in the internal meeting or client meeting. The solution of this issue shall satisfy every team member.

Response Plan   An emergency meeting will be held within the group to discuss the controversial issue. A voting process may be held.

R004: Fail or late of delivery   **Probability:** Medium   **Impact:** Medium

Description   Team member's deliverable is not on time.

Indicator   Late commits or no commit over the preset deliverable deadline.

Mitigation   Ensure team members have proper workload, understanding of the importance of deliver on time.

Response Plan   Other team members shall help the team member who fail or late of delivery to make the project follow the project plan.

R005: Lack of contribution   **Probability:** Medium   **Impact:** Medium

Description   Team member fail to contribute as much as others in the team.

Indicator   Team member has no or lack of submission to the SVN repository.

Mitigation   Project manager shall separate the workload properly.

Response Plan   When this problem is found, team leader or project manager shall "rebalance" the workload per capital.

R006: Project file missing   **Probability:** Low   **Impact:** High

Description   Data or file lost caused by computer damage.

Indicator   Team member's hardware failure.

Mitigation   Team members shall keep committing to the SVN repository constantly.

Response Plan   Data rescue methods will be carried out in order to retrieve the missing data or file.

R007: SVN failure   **Probability:** Low   **Impact:** High

Description   The team's SVN repository is "offline" or does not work correctly.

Indicator   All team member's committing and updating through the SVN system failed and error messages received.

Mitigation   A backup repository shall be set up by the documentation manager to ensure the failure of the main repository won't affect the current workflow.

Response Plan   Try to contact course coordinator and get the approximate date of the system recovery, in the mean time, try to retrieve as many as files possible from the main repository and backup repository.

R008: Misplacing locker key   **Probability:** Low   **Impact:** Medium

Description   The key was lost by team member.

Indicator   The misplacing of the key was reported.

Mitigation   Once the team gets the locker key, a backup copy of the locker key shall be made and kept in safe place. The person in charge of the key will ensure key is kept safe at all times.

Response Plan   Report to the course coordinator, and move the robot to a safe place using the copy of the key.

R009: Damage to the robot   **Probability:** Low   **Impact:** High

Description   One component of the robot or the entire robot was damaged by the team member.

Indicator   Missing or broken parts of the robot or the robot won't work correctly.

Mitigation   Team member shall take care of the robot parts and the intelligent brick.

Response Plan   Report to project manager and course coordinator for the broken of the robot.

R010: Milestone failure   **Probability:** Low   **Impact:** High

Description   Team is unable to meet preset milestone or major milestone which agreed with clients.

Indicator   Team fail to implement certain the functionality by due date of milestone.

Mitigation   Project manager shall check the progress of the project every day, and ensure the milestone will be finished on schedule.

Response Plan   Renegotiation with client to set new milestones. Re-schedule the tasks to team members. Team member will put more workload into this project to ensure the new milestone will be finished on time.

R011: Requirement changes　　　　**Probability:** Low　　　**Impact:** Low

Description　Requirements pulled from client or internal meetings.

Indicator　Client ask for changes of requirements or team decides to change requirements.

Mitigation　In the requirements elicitation and milestone phase, the team shall make sure all the requirements are recorded and both sides(the team and the client) are satisfied.

Response Plan　Based on new requirements' importance, the project plan shall be re-arranged. QA team shall make sure the change won't have negative impact on the project's quality.

R012: Bluetooth connection error　　　**Probability:** High　　**Impact:** Medium

Description　The team member's PC will not connect to the robot's intelligent brick.

Indicator　Team member's PC is not able to pair with robot through Bluetooth, or could not find the device over the NXJ Browse and NXJ Control.

Mitigation　2011 or later model Macintosh Computer(Mac) has known issue of connecting with the robot, team members who facing such issue shall try to working with the Bluetooth-enabled Windows PC. On the other hand, team members who own a Windows PC shall check their Bluetooth before the project starts.

Response Plan　Team member who working with a Windows PC, if it has no Bluetooth component, shall purchase or borrow a Bluetooth connector in order to connect to the robot. Other team members who only have Macintosh computer can work on the school computer to get access to the Bluetooth connection.

R013: Undefined risks　　　**Probability:** Medium　　**Impact:** Medium

Description　Undefined issues which have negative impact to the project happened.

Indicator　Situations defined as a negative impact happened which could not find in the risk management plan and have no response plan recorded.

Mitigation　The initial risk management plan shall be as comprehensive as possible.

Response Plan　The one who find this issue report to the project manager. A emergency meeting shall be held to discuss such issue and overcome the risk by implementing the required response.

Chapter 5

Process model

For this project, the Waterfall Model has been chosen. Waterfall Model is a well known software process model, it has strict deadline which to help the team focus on the software delivery on time. On the other hand, the feature of having stable requirements can be very helpful to the team's development.
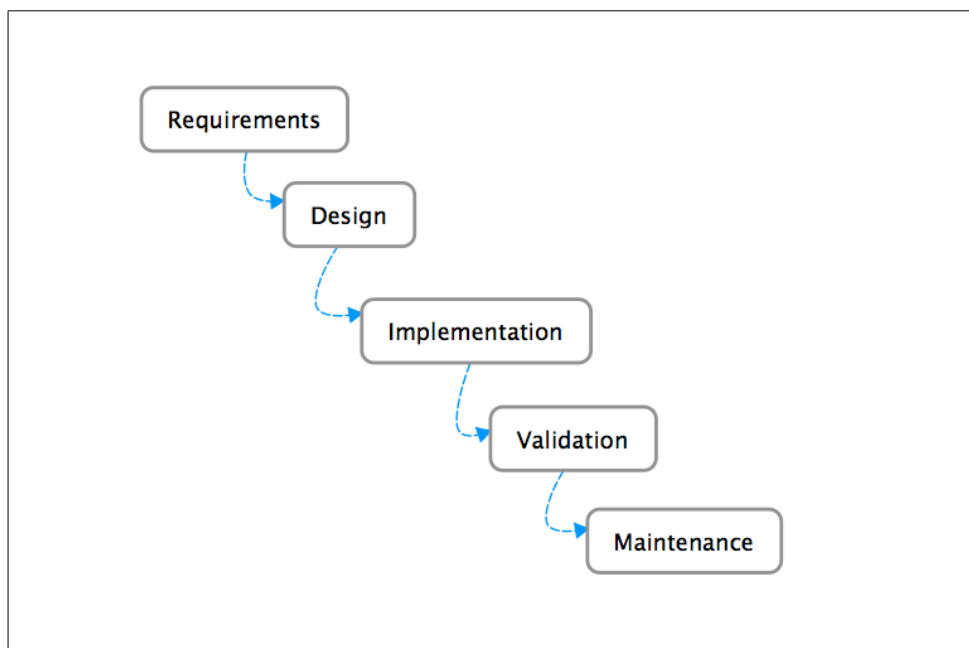
5.1   Waterfall Model

Figure 5.1: The Waterfall Model

The Waterfall Model is a well documented process model, which has more simple approach and disciplined. The waterfall model provides a structured development approach. It includes:

1. Requirements

2. Design

3. Implementation (Coding or construction of the project)

4. Validation (Testing or debugging)

5. Maintenance

Requirements   At the Requirements specification phase, team will perform requirements elicitation based on the project description and the client meetings. All the selected requirements will be listed in the SRS document and implemented during the development phase.

Design: The Design phase is the phase that team members to design and establish a project plan. It is very important for the team to design all the aspects of the project.

Implementation: The main developers will start to implement the software of the project at this phase. Proper SRS documents and plans at earlier phases will be helpful.

Validation: After the implementation is done, the QA engineers will start the Validation phase, involving testing the overall system and ensuring all requirements have being achieved.

Maintenance: After the first release of the software, the team will need to maintain the system and fix possible bugs which would be found by users.

5.1.1   Advantages

1. Simple and disciplined linear software process flow.

2. Well written documentation will be produced earlier in the software life cycle.

3. Software release to the client on deadline.

5.1.2   Disadvantages

1. Not flexible to changing.

2. Late discovery of technical problems.

3. Can not have working software until the end of the development.

4. No testing stage in the early phases.

5.1.3   Minimise the Negative Impact

Chapter 6

Work plan

6.1   Work activities

6.2   Milestones

6.3   Schedule allocation

6.4   Resource allocation

Chapter 7

Supporting plans

7.1   Configuration management plan

7.2   Documentation plan

7.3   Quality assurance plan

Appendix A