Life Cycle Plan (LCP)

ThrdPlace Social Network

Team #7

<table>
<thead>
<tr>
<th>Team members</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaurav Goon</td>
<td>Project Manager</td>
</tr>
<tr>
<td>Yixiang Liu</td>
<td>Operational Concept Engineer</td>
</tr>
<tr>
<td>Tao Hu</td>
<td>Requirements Engineer</td>
</tr>
<tr>
<td>Feng Wen</td>
<td>Prototyper</td>
</tr>
<tr>
<td>Ronghui Zhang</td>
<td>Software Architect</td>
</tr>
<tr>
<td>Xin Liu</td>
<td>Feasibility Analyst</td>
</tr>
<tr>
<td>Kan Qi</td>
<td>Life Cycle Planner</td>
</tr>
</tbody>
</table>

10/12/2013
## Version History

<table>
<thead>
<tr>
<th>Date</th>
<th>Author</th>
<th>Version</th>
<th>Changes made</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>09/25/13</td>
<td>Kan Qi</td>
<td>1.0</td>
<td>• Original for CSCI577a; Tailored from ICSM OCD Template</td>
<td>• To fit CSCI577a course content</td>
</tr>
<tr>
<td>09/26/13</td>
<td>Kan Qi</td>
<td>1.1</td>
<td>• Add section 3.3</td>
<td>• To identify team members’ skills and specify their role in this project</td>
</tr>
<tr>
<td>10/10/13</td>
<td>Kan Qi</td>
<td>2.0</td>
<td>• Update section 3.3, and add section 1,2,3.1</td>
<td>• To make an introduction to life cycle planning, define the milestones and products deliverable in the whole project, specify team members’ responsibilities by phase, as well as correct some errors in section 3.3</td>
</tr>
<tr>
<td>10/12/13</td>
<td>Kan Qi</td>
<td>3.0</td>
<td>• Update section 1,2,3, and add section 4,5</td>
<td>• To specify the approach this project would be implemented with and its required resources</td>
</tr>
</tbody>
</table>
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Figure 5: COCOMO Estimation Result
Introduction

Purpose of the LCP

Since a Life Cycle Plan describes overall strategy, artifacts, and responsibility about entire project, it is very important to well organize plan. This will help every stakeholder to understand the flow of project, identify their role, and skills.

Status of the LCP

By specifying monitoring and controlling methods, as well as facilities and tools which will be used in this project, decision on which approach will be adopted to help implementation of the project will be made in this version. Besides, resources necessary for the project’s success will also be identified. This document will be a part of Foundation Commitment Package.

Assumptions

(1) The duration of the project is 24 weeks from Fall 2013 to Spring 2014.

(2) The team has 7 on-campus students working on the project.

(3) All the project stakeholders fully understand their responsibilities and will be committed to fulfilling their duties until the end of this project.

(4) Development team members and clients are able to recognize win-win conditions and thus have a shared vision or goals of the final product and work concordantly to achieve the goals.

(5) Every team member and the client will have a regular meeting once a week to share their weekly progress, issues, and concerns.

(6) Thrdplace Social Networking would provide the development team with an access to its database and detailed documentation of it.

(7) Thrdplace Social Networking would pay for the costs of some COTS/NDI/NCS which need to be integrated into the system.
Milestones and Products

Figure 1: Architected Agile Process Pattern

Figure 2: Use Single NDI Process Pattern

Figure 3: NDI-Intensive Process Pattern
According to the result of counting and comparing disqualified items in each process pattern, Architected agile has been proven the most suitable process pattern for Thrdplace social networking. NDI/NCS, such as Google Map API and Klout Social Influence Ranking Services would be parts of this project, so it is high possibility that the resultant system would include more than 30% of NDI/NCS features. However, because the clients also require much customization on those NDI/NCS and many features which require coding, it’s not much possible that single NDI/NCS would satisfy the requirements for its functionalities. As for the business process of this system, it’s unique in some degree, because the system should make intelligent recommendations based on information from user and project profiles. Thus, the rating of unique business process should be high. For the reason that the final system would run as a website on Thrdplace’s web server, it’s obvious that the system need control over upgrade, so the rating for this item would be very high. This system would be a subsystem of the original Thrdplace website to enhance its social networking capabilities, so deployment of this system should not influence proper functioning of the original Thrdplace website and a fast deployment of the system would be highly needed. As what have been mentioned before, the expected system should be a part of the existent Thrdplace website and run on its database, so system compatibility is pretty critical. The system should be an internet-connection-dependent system, cause it only provide users an access to its functionalities through web browsers. High performance should be ensured in this system, cause there is high possibility that a large quantity of users access the system via web browsers concurrently. Also, the requirement for high security will be restrict, because the system would directly access Thrdplace’s database and information of users and clients in it. According to the agreed requirements so far, the system would not concern asynchronous communication, so the rating for this part should be low. As for the part of critical mass schedule constraint, because the development team members are all on-campus students and taking several other courses at the same time of commitment to the project, so, by estimating amount of time in which developers can get together and work on the project, the schedule constraint is estimated nominal. It is moderately possible that the situation of lacking personnel capability would happen in the development process, cause we have to understand the existent Thrdplace database and development a profile and a intelligent recommendation system on it, if the volume of data or the scale of the database is far beyond our expectation, shortage in personnel capability is possible. According to one of Dekoven(co-founder of Thrdplace), the access to services of Klout would be charged at about $1,000 a month, so if we decide to use services provided by Klout, an upfront fee would be incurred pretty likely. Except for the fee incurred by Klout services, there are no many other fees for the ownership of
the system, so the rating for low total cost of ownership is moderate. Because this system is actually a website whose functioning largely depends on capability of the server, powerful local machines are not required. By inputting those ratings mentioned above into Process Decision Driver Diagram and calculating the disqualified items in each process pattern, we find that the architected agile process pattern would be most suitable for us to implement the expected system.

**Exploration Phase**

**Duration:** 09/11/13 – 09/27/13  
**Concept:** In this phase, the development team will focus on exploring current system and planning and managing project through the information provided by clients in client interaction session. For exploring current system part, it includes such several sub-components as analyzing current system, exploring other alternatives, conducting assess and plans to mitigate potential risks. For planning and managing project, it involves identifying responsibilities and skills, detailing project plan, recording project individual effort, and recording project progress.

**Deliverables:** Valuation Commitment Package  
**Milestone:** Valuation Commitment Review  
**Strategy:** One Incremental Commitment Cycle

**Valuation Phase**

**Duration:** 09/28/13– 10/21/13  
**Concept:** By performing several Win-Win negotiation sessions in which all the success-critical stakeholders participated, the development team will identify objectives, constraints and priorities, developing operational concept, exploring alternatives, providing project feasibility evidence, initial prototyping, further mitigating risks by planning and assessment, defining quality and configuration policy, verifying and validating artifacts.

**Deliverables:** Foundations Commitment Package  
**Milestone:** Foundations Commitment Review  
**Strategy:** Win-Win negotiation, initial prototype development

**Foundations Phase**

**Duration:** 10/22/13 – 12/09/13  
**Concept:**  
In this phase, the core activities should include project status assessment, project planning and management, project quality management, prototyping, software architecture development. The development team should keep interactive with clients by holding weekly meetings in order to decide all the COTS/NDI/NCS required for the system and provide reports of them to clients. The project plan needs to update weekly and ARB-FCR will be held in this period of time.

**Deliverable:** Development Commitment Package  
**Milestone:** Development Commitment Review  
**Strategy:** Procedure and functional prototype development

**Development phase - Construction Iteration**

**Duration:** 1/11/14 – 4/16/14
**Concept:** In this phase, the development team should keep detailing project plan and recording project progress and emphasize on implementing the system and performing tests. Such a construction process should be iterated several times in this period of time. Besides, several milestones will be walked through in this phase, which includes core capability drivethrough and transition readiness review.

**Deliverable:** Transition Readiness Review Package, Draft Transition Readiness Review Package

**Milestone:** Transition Readiness Review, Draft Transition Readiness Review Package, Integrated system

**Strategy:** Development and testing

**Development phase - Transition Iteration**

**Duration:** 4/17/14 – 5/07/12

**Concept:** In this stage, the development team should perform system transition by providing maintenance information, tutorial session, technical support, as well as user menu which covers different user roles. The milestone of this phase, which is operational commitment review would directly lead to the final product release.

**Deliverable:** Operational Commitment Review Package, Transition manual

**Milestone:** Operational Commitment Review Package, Transition manual

**Strategy:** Deployment, Training, and Transition

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**Project Deliverables**

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**Exploration Phase**

**Table 1: Artifact deliverable in Exploration Phase**

<table>
<thead>
<tr>
<th>Artifact</th>
<th>Due date</th>
<th>Format</th>
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<tr>
<td>Valuation Commitment Package</td>
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<td>.doc, .pdf</td>
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<td>• Operational Concept Description (OCD) Early Section</td>
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<tr>
<td>• Life Cycle Plan (LCP)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Feasibility Evidence Description (FED) Early Section</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Effort Report</td>
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<td>Text</td>
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<tr>
<td>Project Plan</td>
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<td>Bug and Issue Report</td>
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## Valuation Phase

### Table 2: Artifact deliverable in Valuation Phase

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<td>- Operational Concept Description (OCD)</td>
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<td>- Life Cycle Plan (LCP)</td>
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<tr>
<td>- Feasibility Evidence Description (FED)</td>
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<td></td>
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<tr>
<td>- Prototype Report (PRO)</td>
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<tr>
<td>- System and Software Architecture Description Template for NDI NCS Team (SSAD)</td>
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<tr>
<td>Supporting Information Document (SID)</td>
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<td>10/16/2013 .doc,.pdf</td>
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## Foundations Phase

### Table 3: Artifact deliverable in Foundations Phase

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### Documents Overview

- **Life Cycle Plan (LCP)**
- **Feasibility Evidence Description (FED)**
- **Prototype Report (PRO)**
- **System and Software Architecture Description Template for NDI NCS Team (SSAD)**
- **Supporting Information Document (SID)**
- **Quality Management Plan (QMP)**
- **Test Plan and Cases (TPC)**

### Development Commitment Package

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<th>Document Type</th>
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12/09/2013
## Development Phase

### Table 4: Artifact deliverable in Development Phase

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| Draft Rebaselined Development Commitment Package  
- Operational Concept Description (OCD)  
- Life Cycle Plan (LCP)  
- Feasibility Evidence Description (FED)  
- Prototype Report (PRO)  
- System and Software Architecture Description Template for NDI NCS Team (SSAD)  
- Supporting Information Document (SID)  
- Quality Management Plan (QMP) Test Plan and Cases (TPC) | 02/08/2014 | .doc, .pdf | Soft copy |
| Draft Rebaselined Development Commitment Package Evaluation  
- Operational Concept Description (OCD)  
- Life Cycle Plan (LCP)  
- Feasibility Evidence Description (FED)  
- Prototype Report (PRO)  
- System and Software Architecture Description Template for NDI NCS Team (SSAD)  
- Supporting Information Document (SID)  
- Quality Management Plan (QMP) Test Plan and Cases (TPC) | 02/17/2014 | .doc, .pdf | Soft copy |
<p>| Rebaselined Development Commitment Package | 02/22/2014 | .doc, .pdf | Soft copy |
| Rebaselined Development Commitment Package Evaluation | 03/08/2014 | .doc, .pdf | Soft copy |</p>
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<td>Every Monday</td>
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<td>ER system</td>
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<tr>
<td>Bug and Issue Report</td>
<td>Every Wednesday</td>
<td>Text</td>
<td>Bugzilla</td>
</tr>
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</table>
Responsibilities

Project-specific stakeholder’s responsibilities

The stakeholders involved in this project should be categorized into four types clients including Dekoven and Mike(co-founders of Thrdplace), users, maintainers, and the development team which includes project manager, operational concept engineer, requirements engineer, prototyper, software architect, life cycle planner, and IIV&V.

Responsibilities by Phase

Table 5: Stakeholder's Responsibilities in each phase

<table>
<thead>
<tr>
<th>Team Member / Role</th>
<th>Primary / Secondary Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dekoven and Mike:</td>
<td>Client: - Provide domain information - Define current system shortfalls - Define desired system and the requirements to achieve it</td>
</tr>
<tr>
<td></td>
<td>Client: - Provide domain information - Define current system shortfalls - Define desired system and the requirements to achieve it</td>
</tr>
<tr>
<td></td>
<td>Client: - Provide feedbacks based on prototype - Define prototype shortfalls - Define desired system and the requirements to achieve it - Provide changed requirements</td>
</tr>
<tr>
<td></td>
<td>Client: - Provide feedbacks based on current system - Provide changed requirements</td>
</tr>
<tr>
<td></td>
<td>Client: - Provide feedbacks based on current system - Provide changed requirements</td>
</tr>
<tr>
<td></td>
<td>Maintainer: - Receive training for the new system, provide training for users - Maintain the system</td>
</tr>
<tr>
<td></td>
<td>Gaurav Doon: PM: - Creating the Project Plan - Distribute workload, give specific task to each team member</td>
</tr>
<tr>
<td></td>
<td>PM: - Manage Project - Distribute workload, give specific task to each team member Evidence</td>
</tr>
<tr>
<td></td>
<td>PM: - Manage Project - Distribute workload, give specific task to each team member Evidence</td>
</tr>
<tr>
<td></td>
<td>PM: - Plan Project Life, TrackProgress - Distribute workload, give specific task to each team member Evidence</td>
</tr>
<tr>
<td></td>
<td>Implementation: - Provide training, - Transition the system Builder: - Implement the main functions of system.</td>
</tr>
<tr>
<td><strong>Yixiang Liu:</strong> Operational Concept Engineer (OCE) &amp; Builder</td>
<td><strong>OCE:</strong></td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| **Operational Concept Engineer (OCE) & Builder**             | - Analyze the current system  
- Set specific goals, visions, and user scenarios | - Define Project goals  
- Define Operational Concept  
- Define Organizational and Operational Implications | - Refine Operational Concept  
- Refine Organizational and Operational Implications | - Check whether requirements are properly implemented. | - Provide training,  
- Transition the system.  
**Builder:** - Implement the main functions of system. |
| **Xin Liu:** Feasibility Analyst (FA) & Web Designer          | **FA:** | **FA:** | **FA:** | **Web Designer:** | **Implementation:** |
| **Feasibility Analyst (FA) & Web Designer**                   | - Assess Project Risk  
- Plan Risk Mitigation technique | - Provide Project Feasibility Evidence  
- Assess NCS components | - Assess Project Progress | - Designing UI and contents of website.  
- Reflect client’s feedback to design | - Provide training,  
- Transition the system  
**Web Designer:** - Reflect client’s feedback to design |
| **Feng Wen:** Prototyper (PR) & Web Designer                  | **PR:** | **PR:** | **PR:** | **Web Designer:** | **Implementation:** |
| **Prototyper (PR) & Web Designer**                            | - Prioritize system capabilities  
- Design prototype  
- Co-work with Software Architecture | - Assess NCS components  
- Prototyping | - Prototyping | - Designing UI and contents of website.  
- Reflect client’s feedback to design | - Provide training,  
- Transition the system  
**Web Designer:** - Reflect client’s feedback to design |
| **Ronghui Zhang:** Software Architect & Builder               | **SA:** | **SA:** | **SA:** | **Builder:** | **Implementation:** |
| **Software Architect & Builder**                              | - Analyze and develop current system with the technologies  
- Work with Prototyper to design, and model the new system | - Set up basic infrastructure  
- Define Architecture | - Elaborate the system architecture | - Implement the main functions of system. | - Provide training,  
- Transition the system  
**Builder:** - Implement the main functions of system. |
| **Tao Hu:** IIIV (VV), Shaper (SH), Requirement Engineer (ER) & Builder | **VV:** | **VV:** | **VV:** | **Implementation:** | **Implementation:** |
| **IIIV (VV), Shaper (SH), Requirement Engineer (ER) & Builder** | - Review the project artifacts  
- Manage Project Quality  
- Assess WinWin negotiation context | - Review the project artifacts  
- Manage Project Quality  
- Assess WinWin negotiation context | - Review the project artifacts  
- Manage Project Quality  
- Assess WinWin negotiation context | - Plan and ManageProject,  
- Implement the System,  
**VV:** - Perform testing,  
**RE:** - Check whether requirements are properly implemented. | - Provide training,  
- Transition the system  
**Builder:** - Implement the main functions of system. |
collect data to develop the system
- Negotiate with the client to meet win-win condition
Operational Concept
- Define Project goals

**Kan Qi:**
Life Cycle Planner(LCP), Web Designer & Builder

**LCP:**
- Plan Project Plan
- Identify team members’ responsibilities
**LCP:**
- Plan detailed Project Life Cycle
- Provide Project Feasibility Evidence
**LCP:**
- Manage Project Life Cycle
- Provide Project Feasibility
**LCP:**
- Re-planning for changed project status
- Assess tasks and time needed for implementation
**Builder:**
- Implement the main functions of system.

### Skills

**Table 6: Development Team Members' Skills**

<table>
<thead>
<tr>
<th>Team members</th>
<th>Role</th>
<th>Skills</th>
</tr>
</thead>
</table>
| Gaurav Doon  | Project Manager | Current skills: C/C++, Java, HTML, JAVASCRIPT, Mysql
Required skills: cocomo II, Microsoft Project, Bugzilla, Winbook |
| Tao Hu       | Primary Role: Requirement Engineer and Shaper Secondary Role: IIIV & V | Current skills: HTML/CSS, PHP, JavaScript, jQuery, SQL, Apache, JSP, Java Servlet, Android/iOS development (Eclipse, Xcode, Objective-C), Linux, Git, Shell
Required skills: Trello, Mind42, Winbook |
| Kan Qi       | Life Cycle Planner | Current skills: Java, C/C++, PHP, JavaScript, Mysql, JSP, Android, HTML/CSS, SVN
Required skills: COCOMOII, Bugzilla, COTIPMO for NDI/NCS Project, COTIPMO for Architected Agile Project, Microsoft Project |
| Yixiang Liu  | Operational Concept Engineer | Current skills: Java, C/C++, PHP, HTML/CSS
Required skills: ER diagram or EER diagram, Winbook, Bugzilla |
<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Current skills:</th>
<th>Required skills:</th>
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</thead>
<tbody>
<tr>
<td>Xin Liu</td>
<td>Feasibility Analyst</td>
<td>Java/C++</td>
<td>ROI calculation, COCOMOII, Bugzilla</td>
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<tr>
<td>Feng Wen</td>
<td>Prototyper</td>
<td>Java, C, Android, Win32, HTML/CSS</td>
<td>ER diagram or EER diagram, Bugzilla, COTIPOMO, UML</td>
</tr>
<tr>
<td>Ronghui Zhang</td>
<td>Software Architect</td>
<td>C/C++, C#, Java, Python, assembly language, Verilog HDL, VHDL, yacc, lex, J2EE, HTML/CSS, Microsoft SQL Server</td>
<td>UML, VPUML, Bugzilla</td>
</tr>
</tbody>
</table>
Approach

Monitoring and Control

The bi-weekly project plan will provide a guideline for team members to execute their duties specified in the life cycle plan. Besides, bi-weekly progress report and monthly effort report as well as weekly team meetings would valuable statistics for understanding the current project status and adjust it to better fit the decided project plan. Also, if there are some bugs found in past works or issues pending shortly, then project manager and IIV&V can issue a ticket through Bugzilla to notify the issue or bug related team members and specify their duties in fixing them.

Closed Loop Feedback Control

Two effective communication tools have been adopted by our team to realize feedback control, which are Wechat and Bugzilla. Wechat is a real-time chatting system, which helps us to manage project-related logistics, such as settling team meeting schedule, booking group discussing room, and so on. As for Bugzilla, it’s a bug tracking system which helps team members to keep informed with their duties in fixing bugs and shortly coming events.

Reviews

Usually reviews for project artifacts would go through three steps, which respectively are peer reviews after an artifact is finished, then IIV&V reviews for its correctness and validity (if there are some defects or errors existing in the artifact, IIV&V would issue a ticket in Bugzilla to notify the responsible parts for correction of the bugs), and finally reviews by teaching staff members.

Methods, Tools and Facilities

<table>
<thead>
<tr>
<th>Tools</th>
<th>Usage</th>
<th>Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>WinWinBook</td>
<td>Identifying WinWin Conditions and negotiating agreements</td>
<td>USC</td>
</tr>
<tr>
<td>Bugzilla</td>
<td>Report defect/errors/bugs etc</td>
<td>USC</td>
</tr>
<tr>
<td>Dropbox</td>
<td>Collaborate on the latest document version and share resources</td>
<td>Dropbox</td>
</tr>
<tr>
<td>WeChat</td>
<td>Communication between team members</td>
<td>Tecent</td>
</tr>
<tr>
<td>CSE Effort Reporting System</td>
<td>Individual effort records</td>
<td>USC</td>
</tr>
<tr>
<td>Email</td>
<td>One of the main tools of communication</td>
<td>USC/Google</td>
</tr>
<tr>
<td>Project Website</td>
<td>Documentation, Client Meeting Notes Record</td>
<td>USC</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Microsoft Project</td>
<td>Project managing and planning</td>
<td>Microsoft</td>
</tr>
<tr>
<td>Rational Software Modeler</td>
<td>UML modeling</td>
<td>IBM</td>
</tr>
<tr>
<td>Eclipse</td>
<td>Integration development environment for PHP and HTML development</td>
<td>IBM</td>
</tr>
<tr>
<td>Apache</td>
<td>Web server for PHP application</td>
<td>Apache Software Foundation</td>
</tr>
<tr>
<td>COTIPMO</td>
<td>Assess and estimate product accuracies and its timely delivery</td>
<td>USC</td>
</tr>
</tbody>
</table>
Resources

In this section, we present the project effort and schedule estimation of the project using COCOMO II. The following conditions were used to estimate the cost of our system, the Plant Service Tracking System.

- Estimated CSCI577a Effort: 7 team members at 10 hrs./week for 12 weeks
- Estimated CSCI577b Effort: 5 team members at 10 hrs./week for 12 weeks
- Total estimated effort: 9.6PM
- Budget information: estimate budget $3000
- Project duration: 24 weeks
- Component modules in your development project: user and project profile management, search engine, and intelligent recommendation

Programming language used: PHP

The following is module listed in the system and its estimated size with Source Lines of Code (SLOC)

Table 8: Module lists and SLOC of each module

<table>
<thead>
<tr>
<th>No.</th>
<th>Module Name</th>
<th>Brief Description</th>
<th>SLOC</th>
<th>REVL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>User and project profile management</td>
<td>Provide interface for users to add/edit their personal profile and project profiles launched by them. Display brief and detailed user or project profiles on map mode or list mode.</td>
<td>1500</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>Search Engine</td>
<td>Allow users to search keywords and get the related information from Thrdplace’s database. Allow advanced searching by different dimensions and categories.</td>
<td>2000</td>
<td>15%</td>
</tr>
<tr>
<td>3</td>
<td>Intelligent Recommendation</td>
<td>The system would automatically provide an user with information about users or projects which he/she might be interested in</td>
<td>500</td>
<td>5%</td>
</tr>
</tbody>
</table>

The following is COCOMOII Scale Drivers and rationales of choosing the values.

Table 9: COCOMOII Scale Drivers

<table>
<thead>
<tr>
<th>Scale Driver</th>
<th>Value</th>
<th>Rationale</th>
</tr>
</thead>
</table>

16
Although, team members are all familiar with this type of online application, they don’t know well about PHP programming and there would be an effort on understanding Thrdplace’s database and server, and business work flow of it.

Except for the three major established features required by Thrdplace, our project team have high flexibility in negotiating changes and making modifications, settling down development schedules and so on so forth.

For now, we know clearly where the critical risk items are, and the constraints on budget and schedule. However, there are still some uncertainties about Thrdplace’s original platform including its database and web server specs, which increase the risk of integration failure.

Each stakeholder has considerable consistency of objectives and cultures, and considerable ability and willingness to accommodate others’ objectives. In addition, the stakeholders have basic experience in operating as a team.

The development team follows ICSM guidelines, which is a well defined and managed process. However, due to the unthorough understanding of it, some consistent results might occur. So the process is repeatable and at CMM Level 2.

The following is COCOMOII Cost Drivers of each module and rationales of choosing the values.

**Table 10: COCOMOII Cost Drivers of Module 1 - User and project profile management**

<table>
<thead>
<tr>
<th>Cost Driver</th>
<th>Value</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELY</td>
<td>NOMINAL</td>
<td>Other modules in this project is independent on this module, so it’s failure can hardly affect other modules’ proper functioning ans losses can be easily recovered.</td>
</tr>
<tr>
<td>DATA</td>
<td>NOMINAL</td>
<td>This module would mainly deal with two tables in Thrdplace’s database, say, user table and project table. However, we don’t know for sure how many bytes of data in those two tales for now. Even though we can estimate the total lines of code this system would have, we still can’t decide the data volume, so we have to set DATA nominal at present.</td>
</tr>
<tr>
<td>DOCU</td>
<td>NOMINAL</td>
<td>Because the development process follows ICSM, the document for life-cycle needs is normal.</td>
</tr>
<tr>
<td>CPLX</td>
<td>LOW</td>
<td>For the reason that this module will not concern complex control, computational, device dependent operations and just moderately complex SQL queries and graphic interface management are required, complexity of this module should be low.</td>
</tr>
<tr>
<td>RUSE</td>
<td>LOW</td>
<td>It is not intended to be reused for the future project.</td>
</tr>
<tr>
<td>TIME</td>
<td>HIGH</td>
<td>The percentage of available execution time expected to be used by the system and subsystem consuming the execution time</td>
</tr>
</tbody>
</table>
resource is less than 70% because viewing project and user profile pages would be the functionalities users most often use and on which they stay for the longest time compared with other functionalities this system provides.

<table>
<thead>
<tr>
<th>STOR</th>
<th>NOMINAL</th>
<th>The percentage of available storage expected to be used by the system and subsystem is less than 50% because most data is stored as textual records, and some of them might include some low-definition image as users’ profile pictures.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVOL</td>
<td>LOW</td>
<td>Major changes of the platform, i.e. Apache, PHP, MySQL, and web browsers, are approximately every year.</td>
</tr>
<tr>
<td>ACAP</td>
<td>HIGH</td>
<td>The analysts have the ability to analyze, design, communicate, and cooperate well.</td>
</tr>
<tr>
<td>PCAP</td>
<td>HIGH</td>
<td>Programmers are capable, efficient and thorough. They are able to communicate and cooperate well.</td>
</tr>
<tr>
<td>PCON</td>
<td>NOMINAL</td>
<td>There will be personnel deduction which is about two in the spring 2014 semester.</td>
</tr>
<tr>
<td>APEX</td>
<td>NOMINAL</td>
<td>The average experience of the team members for this online web-based application is about one year.</td>
</tr>
<tr>
<td>LTEX</td>
<td>NOMINAL</td>
<td>The development team plans to develop this web-based application with PHP, HTML/CSS, and use SQL language to query information from the database. Eclipse will be used as integrated development environment to facilitate its development. Even though all team members have at least one year of web development, most of us are not very familiar with PHP, so LTEX should be nominal.</td>
</tr>
<tr>
<td>PLEX</td>
<td>LOW</td>
<td>As what mentioned above, most team members are not familiar with PHP and we still don’t have access to or documentation explanations about Thrdplace’s database until now.</td>
</tr>
<tr>
<td>TOOL</td>
<td>LOW</td>
<td>The software tools development team plan to use is just simple, frontend, backend CASE, and supporting little integration. There is no support for life-cycle.</td>
</tr>
<tr>
<td>SITE</td>
<td>VERY HIGH</td>
<td>All the team members are all on-campus students and can arrange meetings easily. Additionally, we use wideband electronic communication and occasional video conference.</td>
</tr>
<tr>
<td>SCED</td>
<td>NOMINAL</td>
<td>The schedule is fixed for 12 weeks in Fall semester and 12 weeks in Spring semester.</td>
</tr>
</tbody>
</table>

**Table 11: COCOMOII Cost Drivers of Module 2- Search Engine**

<table>
<thead>
<tr>
<th>Cost Driver</th>
<th>Value</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELY</td>
<td>NOMINAL</td>
<td>Other modules in this project is independent on this module, so it’s failure can hardly affect other modules’ proper functioning and losses can be easily recovered.</td>
</tr>
<tr>
<td>DATA</td>
<td>NOMINAL</td>
<td>we don’t know for sure how many bytes of data in Thrdplace’s database. Even though we can estimate the total lines of code this system would have, we still can’t decide the data volume, so we have to set DATA nominal at present.</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>DOCU</td>
<td>NOMINAL</td>
<td>Because the development process follows ICSM, the document for life-cycle needs is normal.</td>
</tr>
<tr>
<td>CPLX</td>
<td>LOW</td>
<td>For the reason that this module will not concern complex control, computational, device dependent operations and just moderately complex SQL queries and graphic interface management are required, complexity of this module should be low.</td>
</tr>
<tr>
<td>RUSE</td>
<td>LOW</td>
<td>It is not intended to be reused for the future project.</td>
</tr>
<tr>
<td>TIME</td>
<td>NOMINAL</td>
<td>The percentage of available execution time expected to be used by the system and subsystem consuming the execution time resource is less than 50% because searching would be one of the most frequently used functionalities this system provide.</td>
</tr>
<tr>
<td>STOR</td>
<td>NOMINAL</td>
<td>The percentage of available storage expected to be used by the system and subsystem is less than 50% because most data is stored as textual records, and some of them might include some low-definition image as users’ profile pictures.</td>
</tr>
<tr>
<td>PVOL</td>
<td>LOW</td>
<td>Major changes of the platform, i.e. Apache, PHP, MySQL, and web browsers, are approximately every year.</td>
</tr>
<tr>
<td>ACAP</td>
<td>HIGH</td>
<td>The analysts have the ability to analyze, design, communicate, and cooperate very well.</td>
</tr>
<tr>
<td>PCAP</td>
<td>HIGH</td>
<td>Programmers are capable, efficient and thorough. They are able to communicate and cooperate very well.</td>
</tr>
<tr>
<td>PCON</td>
<td>NOMINAL</td>
<td>There will be personnel deduction which is about two in the spring 2014 semester.</td>
</tr>
<tr>
<td>APEX</td>
<td>NOMINAL</td>
<td>The average experience of the team members for this online web-based application is about one year.</td>
</tr>
<tr>
<td>LTEX</td>
<td>NOMINAL</td>
<td>The development team plans to develop this web-based application with PHP, HTML/CSS, and use SQL language to query information from the database. Eclipse will be used as integrated development environment to facilitate its development. Even though all team members have at least one year of web development, most of us are not very familiar with PHP, so LTEX should be nominal.</td>
</tr>
<tr>
<td>PLEX</td>
<td>LOW</td>
<td>As what mentioned above, most team members are not familiar with PHP and we still don’t have access to or documentation explanations about Thrdplace’s database until now.</td>
</tr>
<tr>
<td>TOOL</td>
<td>LOW</td>
<td>The software tools development team plan to use are just simple coding facilitating platforms, and supporting little integration. There is no support for life-cycle.</td>
</tr>
<tr>
<td>SITE</td>
<td>VERY HIGH</td>
<td>All the team members are all on-campus students and can arrange meetings easily. Additionally, we use wideband electronic communication and occasional video conference.</td>
</tr>
<tr>
<td>SCED</td>
<td>NOMINAL</td>
<td>The schedule is fixed for 12 weeks in Fall semester and 12 weeks</td>
</tr>
</tbody>
</table>
in Spring semester.

Table 12: COCOMOII Cost Drivers of Module 3 - Intelligent Recommendation

<table>
<thead>
<tr>
<th>Cost Driver</th>
<th>Value</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>RELY</td>
<td>NOMINAL</td>
<td>Other modules in this project is independent on this module, so it’s failure can hardly affect other modules’ proper functioning and losses can be easily recovered.</td>
</tr>
<tr>
<td>DATA</td>
<td>NOMINAL</td>
<td>We don’t know for sure how many bytes of data in Thrldplace’s database now. Even though we can estimate the total lines of code this system would have, we still can’t decide the data volume, so we have to set DATA nominal at present.</td>
</tr>
<tr>
<td>DOCU</td>
<td>NOMINAL</td>
<td>Because the development process follows ICSM, the document for life-cycle needs is normal.</td>
</tr>
<tr>
<td>CPLX</td>
<td>HIGH</td>
<td>Although this module will not involve complex control, computational, device dependent operations, complicated SQL queries are required to carry out information related to currently logged-in user, so complexity of this module should be nominal.</td>
</tr>
<tr>
<td>RUSE</td>
<td>LOW</td>
<td>It is not intended to be reused for the future project.</td>
</tr>
<tr>
<td>TIME</td>
<td>HIGH</td>
<td>The percentage of available execution time expected to be used by the system and subsystem consuming the execution time resource is less than 50% because viewing project and user profile pages would be the functionalities users most often use and on which they stay for the longest time compared with other functionalities this system provides.</td>
</tr>
<tr>
<td>STOR</td>
<td>NOMINAL</td>
<td>The percentage of available storage expected to be used by the system and subsystem is less than 50% because most data is stored as textual records, and some of them might include some low-definition image as users’ profile pictures.</td>
</tr>
<tr>
<td>PVOL</td>
<td>LOW</td>
<td>Major changes of the platform, i.e. Apache, PHP, MySQL, and web browsers, are approximately every year.</td>
</tr>
<tr>
<td>ACAP</td>
<td>HIGH</td>
<td>The analysts have the ability to analyze, design, communicate, and cooperate very well.</td>
</tr>
<tr>
<td>PCAP</td>
<td>HIGH</td>
<td>Programmers are capable, efficient and thorough. They are able to communicate and cooperate very well.</td>
</tr>
<tr>
<td>PCON</td>
<td>NOMINAL</td>
<td>There will be personnel deduction which is about two in the spring 2014 semester.</td>
</tr>
<tr>
<td>APEX</td>
<td>NOMINAL</td>
<td>The average experience of the team members for this online web-based application is about one year.</td>
</tr>
<tr>
<td>LTEX</td>
<td>NOMINAL</td>
<td>The development team plans to develop this web-based application with PHP, HTML/CSS, and use SQL language to query information from the database. Eclipse will be used as integrated development environment to facilitate its use.</td>
</tr>
</tbody>
</table>
development. Even though all team members have at least one year of web development, most of us are not very familiar with PHP, so LTEX should be nominal.

<table>
<thead>
<tr>
<th>PLEX</th>
<th>LOW</th>
<th>As what mentioned above, most team members are not familiar with PHP and we still don’t have access to or documentation explanations about Thrdplace’s database until now.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOOL</td>
<td>LOW</td>
<td>The software tools development team plan to use is just simple, frontend, backend CASE, and supporting little integration. There is no support for life-cycle.</td>
</tr>
<tr>
<td>SITE</td>
<td>VERY HIGH</td>
<td>All the team members are all on-campus students and can arrange meetings easily. Additionally, we use wideband electronic communication and occasional video conference.</td>
</tr>
<tr>
<td>SCED</td>
<td>NOMINAL</td>
<td>The schedule is fixed for 12 weeks in Fall semester and 12 weeks in Spring semester.</td>
</tr>
</tbody>
</table>

The following is the result from COINCOMOII estimation based on Scale Drivers and Cost Drivers discussed above.

**Figure 5: COCOMO Estimation Result**

![COCOMO Estimation Result](image_url)
The form of schedule our project uses is the Independent Variable (SAIV) strategy, 24-week schedule drives development of a set of top priority core capabilities. Therefore, the estimates show the effort required for the project.

According to COINCOMO II, one team member effort = 0.83 COINCOMO II person months. The most likely effort from the COCOMO estimation above is 8.93, so the total team members need for this project = 8.93/0.83 = 10.76

Since we have 7 developers in total on our team, the estimated workload for this project would exceed our capacity to handle and thus may introduce risks of project failure. Thus, we may need to negotiate high-priority requirements to cut less valuable works and reduce the risk of project incompleteness.
6. Iteration Plan

6.1 Plan

<< Provide a high-level overview of the content of the given iteration. Indicate which Life cycle milestones will be addressed. >>

6.1.1 Capabilities to be implemented

<< For the milestone identified above, identify the capabilities that will be implemented in the upcoming iteration. Identify the features, requirements or use–cases that are being developed (implemented, tested, etc.) for this iteration. Each component should be accounted for in at least one iteration. All requirements should be implemented and tested (or re-negotiated) by the completion of all the iterations. Be mindful of implementation dependencies. Document complex dependencies and communicate them to the appropriate development staff. >>

<table>
<thead>
<tr>
<th>ID</th>
<th>Capability</th>
<th>Description</th>
<th>Priority</th>
<th>Iteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; ID &gt;</td>
<td>&lt; Capability &gt;</td>
<td>&lt; comments &gt;</td>
<td>&lt;value&gt;</td>
<td>&lt;value&gt;</td>
</tr>
</tbody>
</table>

Table 7: Construction iteration capabilities to be implemented

6.1.2 Capabilities to be tested

<< For the milestone identified above, identify the capabilities that will be tested in the upcoming iteration.

Identify the software features and combinations of software features to be tested this iteration. This may also include non-functional requirements or extra-functional requirements, such as performance, portability, and so forth.

Additionally you may need to test every requirement listed in the WinWin Agreements DC package, non-requirement component features such as COTS capabilities and quality, API functionality, etc. >>

<table>
<thead>
<tr>
<th>ID</th>
<th>Capability</th>
<th>Description</th>
<th>Priority</th>
<th>Iteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; ID &gt;</td>
<td>&lt; Capability &gt;</td>
<td>&lt; comments &gt;</td>
<td>&lt;value&gt;</td>
<td>&lt;value&gt;</td>
</tr>
</tbody>
</table>

Table 8: Construction iteration capabilities to be tested
6.1.3 Capabilities not to be tested

<< Identify notable features, and significant combinations of features, which will not be tested this iteration and why (e.g. a given feature uses a feature which will be implemented in following iteration). >>

6.1.4 CCD Preparation Plans

<< Identify the clients and other users who will be involved in the Core Capability Drive-through, the usage scenarios that it will support, and the specific CCD preparation plans and milestones. These may include

- user context-setting
- site preparation dry runs,
- feedback forms, and
- CCD risk management plans. >>

6.2 Iteration Assessment

6.2.1 Capabilities Implemented, Tested, and Results

<< Describes, in brief, the capabilities that were implemented and the test results. The capabilities implemented and tested do not necessarily need to match the ones listed in section 6.1 because some capabilities may have been pushed to the next iteration. >>

<table>
<thead>
<tr>
<th>ID</th>
<th>Capability</th>
<th>Test Case</th>
<th>Test Results</th>
<th>If fail, why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; ID &gt;</td>
<td>&lt; Capability &gt;</td>
<td>&lt; TC-XX &gt;</td>
<td>Pass/Fail</td>
<td>&lt; comments &gt;</td>
</tr>
</tbody>
</table>

6.2.2 Core Capabilities Drive-Through Results

<< Briefly summarize the feedback you received from your client(s). You need to be specific enough to cover the critical capabilities or scenarios that were discussed, demoed, or shown. Your descriptions MUST, but not limited to, cover the following areas:

- Positive feedbacks
- Improvements needed/suggested
  
  - Changes to-be considered (Reprioritized capabilities, requirements, GUI, etc.)
  
  - Risks (New risks introduced, risks mitigated, etc.)
Note: Make sure to be specific to the capabilities shown/demonstrated/driven-through. Simply stating that the clients liked the capabilities is not sufficient. 

6.3 Adherence to Plan

<< Describe how well the iteration ran according to plan. Was it on budget and on time? Is there any uncertainty in the Software Development Status? Provide some insight to avoid mistakes for future iterations. >>