Life Cycle Plan (LCP)

Amer I Can Re-Up

Team - 09

TEAM MEMBERS	ROLES	
Siddharth Sohoni -	Life Cycle Planner	Requirements Engineer
Varun Brahme -	Project Manager	Prototyper
Suparna Dawalkar -	Feasibility Analyst	Software Architect
Priyanka Bhalerao -	Prototyper	Operational Concept Developer
Anumeha Srivastava -	Operational Concept Developer	Life Cycle Planner
Jeffrey Tonkovich -	IIV&V	Systems Engineer

11/29/2011

Version History

Date	Author	Version	Changes made	Rationale
09/21/2011	SS	0.1	Made the Life cycle plan. Draft version generated with client involvement.	Initial draft.
10/4/11	SS	0.2	Change made with respect to issues raised in Bugzilla.	Issues fixed: 4496, 4497, 4498, 4500, 4501, 4502, 4503, 4504, 4505
10/13/11	SS	0.3	Added Section 4.0	Approach. It specifically deals with the team cohesion. How the communication between the team takes place. How the documents are being circulated and evaluated within the team and the tools used for doing that.
10/18/11	SS	0.4	Change made with respect to issues raised in Bugzilla.	Issues Fixed: 5237, 5374, 5372, 5371, 5369, 5391
10/20/11	SS	0.5	Added Section 5.0	It deals with Resources. COCOTS Estimation model is used to provide the effort estimation since the project is using single NDI.
10/24/11	SS	1.0	Responsibilities per phase for CS577b added.	Issues Fixed: 5815, 5816
10/30/11	SS	1.1	Changes made with respect to issues raised in Bugzilla.	Issues Fixed: 5888, 5889, 5890, 5891
11/18/11	SS	1.2	Changes made with respect to issues logged in Bugzilla	Issues Fixed: 6147, 6148, 6149, 6150, 6151, 6152, 6153, 6154, 6155
11/29/11	SS	2.0	Changes made with respect to issues logged in Bugzilla. Final DC package deliverable	Issues Fixed: 6341, 6342, 6343, 6348, 6349, 6350, 6351

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1. Introduction

1.1 Purpose of the LCP

A software development life cycle consists of different phases like Requirement Design, Designing, Coding, Testing, etc. A Life Cycle Plan is used to manage the entire process of software development.

1.2 Status of the LCP

The LCP is currently at version 2.0 for the DC Package. All the open issues fixed. All the sections in the document are completed.

1.3 Assumptions

The project will go on for a period of 24 week. There will be 12 weeks in Fall 2011 and 12 weeks in Spring 2012. Fall 2011 will provide the finalized requirements, design documents, life cycle plan for the whole period, feasibility evidence document and a working prototype of the system.

2. Milestones and Products

2.1 Overall Strategy

Amer I Can Re-Up is a project which will be using the ICSM (Integrated Commitment Spiral Model) process because the requirements of the whole system will be changing throughout the entire 24 week development cycle. The system is an NDI intensive system. The development of the system will be going parallel to the requirement gathering for the succeeding iteration. The GUI (Graphical User Interface) would be provided first and then the functionality will be provided in the later increments.

Exploration Phase:-

Table 1: Strategy for Exploration Phase

Concept	• Analyzed and explored current system and identified basic requirements, operational concepts for the new system. • We have initial life cycle plan, and feasibility evidence. • It will consist of doing research about the different concepts which will be used in the project. There are various concepts such as Skinner box theory, Color Theory and Ning which need to be researched and the usage of the same.
Duration	09/12/2011 to 10/07/2011
Deliverables	Valuation Commitment Package
Milestone	Valuation Commitment Review
Strategy	One Incremental Commitment Cycle

Valuation Phase:-

Table 2: Strategy for Valuation Phase

Concept	• Identified the initial prototype, system and software architecture, system and software requirements; • Made progress on operational concepts, life cycle plan, and feasibility evidence. • It will consist of using decision criteria to determine the type of architecture to be used specifically Architected Agile or NDI. • It will also include WinWin negotiations and fixing the Win conditions.
Duration	10/03/2011 to 10/24/2011
Deliverables	Foundation Commitment Package
Milestone	Foundation Commitment Review
Strategy	One Incremental Commitment Cycle

Foundation Phase:-

Table 3: Strategy for Foundation Phase

Concept	• In this phase the Prototyper will start making workable prototypes which will be used as white boxes in the development phase. • There will be internal meetings within the development to make a final decision on which technology or technologies to use • The project manager will be responsible for assessment of the overall progress of the project. Life Cycle planner along with the Project Manager would be planning the timelines for the various deliverables. • Requirement Engineer would finalize the prioritization of the requirements. • Feasibility Evidence will be assessed by the Project Manager. • There will be an over verification and validation of the various work products.
Duration	10/24/2011 to 12/05/2011
Deliverables	Development Commitment Package
Milestone	Development Commitment Review
Strategy	One Incremental Commitment Cycle

Rebaselined Foundation Phase:-

Table 4: Strategy for Rebaselined Phase

Concept	• Preparation of the development environment. • Briefing the team about the requirements fixed during first semester. • Prepare development plan • Prepare test plan
Duration	01/09/2012 to 02/11/2012
Deliverables	Rebaselined Development Commitment Package
Milestone	Rebaselined Development Commitment Review
Strategy	One Incremental Commitment Cycle

Development Phase:-

Table 5: Strategy for Development Phase

Concept	• Development of system will be done based on the requirements gathered in the first semester. • The most significant components should be implemented first followed by less important requirements. • Testing should be thorough.

Duration	02/11/2012 to 04/15/2012
Deliverables	Operation Commitment Package, CCD Package, TRR Package
Milestone	Operation Commitment Review
Strategy	Three Increments

Transition Phase:-

Table 6: Strategy for Transition Phase

Concept	• Prepare hardware and software environment specified in TP • Show developed capabilities and prepare manual for users • Begin transition of new system to client and users.
Duration	04/16/2012 to 05/05/2012
Deliverables	• Core Capabilities Drive-through report
Milestone	• Core Capability Drive through
Strategy	One Increment

2.2 Project Deliverables

These are the different Deliverables listed below:-

- Operational Concept Description (OCD)
- Prototype Report (PRO)
- Win Conditions Document
- System and Software Architecture Description (SSAD)
- Life Cycle Plan (LCP)
- Feasibility Evidence Description (FED)
- Supporting Information Document (SID)
- Transition Plan (TP)
- Iteration Plan (IP)
- Quality Management Plan (QMP)
- Acceptance Test Plan and Cases (ATPC)

2.2.1 Exploration Phase

The artifacts which need to be provided in the Exploration Phase are given below.

Table 7: Artifacts Deliverables in Exploration Phase

Artifact	Due date	Format	Medium
Client Interaction Report	09/21/2011	.doc, .pdf	Soft copy
Valuation Commitment Package • Operational Concept Description	09/30/2011	.doc, .pdf	Soft copy

(OCD) Early Section • Life Cycle Plan (LCP) Early Section • Feasibility Evidence Description (FED) Early Section			
Project Plan	Every Wednesday	.mpp, .pdf	Soft copy
Progress Report	Every Wednesday	.xls	Soft copy
Effort Report	Every Monday	Online System	
Evaluation of VC Package	10/03/2011	.doc, .pdf	Soft copy

2.2.2 Valuation Phase

The artifacts which need to be provided in the Valuation Phase are given below.

Table 8: Artifacts Deliverables in Valuation Phase

Artifact	Due date	Format	Medium
Project Plan	Every Wednesday	.mpp, .pdf	Soft copy
Progress Report	Every Wednesday	.xls	Soft copy
Effort Report	Every Monday	Online System	
Core FC Package • OCD • PRO • SSRD • SSAD • LCP • FED • SID	10/07/2011	.doc, .pdf	Soft copy
Response to Evaluation of VC Package	10/07/2011	.doc, .pdf	Soft copy
Evaluation of Core FC Package	10/10/2011	.doc, .pdf	Soft copy
Draft FC Package • OCD • PRO • SSRD • SSAD • LCP • FED • SID	10/14/2011	.doc, .pdf	Soft copy
Response to Evaluation of FC Package	10/14/2011	.doc, .pdf	Soft copy
Draft FC Package	10/14/2011	.doc, .pdf	Soft copy

• OCD • PRO • Win Condition Document • SSAD • LCP • FED • SID			
FC Package • OCD • PRO • Win Conditions Document • SSAD • LCP • FED • SID • QMP	10/24/2011	.doc, .pdf	Soft copy
Response to Evaluation of Draft FC Package.	10/24/2011	.doc, .pdf	Soft copy

2.2.3 Foundation Phase

The artifacts which need to be provided in the Foundation Phase are given below.

Table 9: Artifacts Deliverables in Foundation Phase

Artifact	Due date	Format	Medium
Project Plan	Every Wednesday	.mpp, .pdf	Soft copy
Progress Report	Every Wednesday	.xls	Soft copy
Effort Report	Every Monday	Online System	
QMP #1	10/24/2011	.doc, .pdf	Soft copy
Evaluation of FC Package	10/31/2011	.doc, .pdf	Soft copy
Response to Evaluation of FC Package	11/04/2011	.doc, .pdf	Soft copy
QMP #2	11/14/2011	.doc, .pdf	Soft copy
Draft DC package • OCD • PRO • Win Conditions Document • SSAD • LCP • FED • SID	11/21/2011	.doc, .pdf	Soft copy

• QMP • TP • IP • ATPC			
DC Package	12/05/2011	.doc, .pdf	Soft copy
Response to Evaluation of Draft DC Package	12/05/2011	.doc, .pdf	Soft copy

2.2.4 Foundations Phase – Rebaselined

Table 10: Artifacts Deliverables in Rebaselined Phase

Artifact	Due date	Format	Medium
Develop Draft Rebaselined Development Commitment Package	01/14/12	.doc, .pdf	Soft copy
Evaluation documents • Draft RDC document	01/22/12	.doc, .pdf	Soft Copy
Develop Rebaselined Development Commitment Package	02/11/12	.doc, .pdf	Soft Copy

2.2.5 Development Phase

The artifacts which need to be provided in the Development Phase are given below.

Table 11: Artifacts Deliverables in* Development *Phase

Artifact	Due date	Format	Medium
Project Plan	Every Wednesday	.mpp, .pdf	Soft copy
Progress Report	Every Wednesday	.xls	Soft copy
Effort Report	Every Monday	Online System	
Core Capability Drive-through Report	03/23/12	.doc, .pdf	Soft copy
Draft Transition Package	04/13/12	.doc, .pdf	Soft copy
Evaluation of Draft Transition Package	04/15/12	.doc, .pdf	Soft copy
Response to evaluation of Draft Transition Package	04/18/12	.doc, .pdf	Soft copy

2.2.6 Transition Phase

The artifacts which need to be provided in the Development Phase are given below.

Table 12: Artifacts Deliverables in Transition Phase

Artifact	Due date	Format	Medium
Project Plan	Every Wednesday	.mpp, .pdf	Soft copy
Progress Report	Every Wednesday	.xls	Soft copy
Effort Report	Every Monday	Online System	
Transition Package	04/25/12	.doc, .pdf	Soft copy
Risk Analysis	Every Wednesday	Online System	
Draft Operational Commitment Package	04/25/12	.doc, .pdf	Soft copy
Operational Commitment Package	05/03/12	.doc, .pdf	Soft copy

3. Responsibilities

3.1 Project-specific stakeholder's responsibilities

There are no specific stake holders other than client, user, maintainer, developer and IIV&V as of now. The website being developed is a completely new website and the end user would be the most important stake holder.

3.2 Responsibilities by Phase

Table 13: Skills of persons specific to different Phases.

Role / Team Member	Primary / Secondary Responsibility				
	Exploration	**Valuation**	**Foundations**	**Development-** Construction Iteration	**Development-** Transition Iteration
Varun Brahme Primary Role: Project Manager Secondary Role: Prototyper	**Primary Responsibility** - Plan Project Life - Track Progress	**Primary Responsibility** - Plan Project Life - Track Progress	**Primary Responsibility** - Plan Project Life - Track Progress	**Primary Responsibility** - Record Project Progress. Assess Quality Management Strategy - Track Progress	**Primary Responsibility** - Assess Quality Management Strategy - Track Progress
	Secondary Responsibility - Analyze the system requirement.	**Secondary Responsibility** - Analyze and prioritize capabilities - Develop prototype	**Secondary Responsibility** - Assess prototype and components - Analyze and prioritize capabilities - Develop prototype	**Secondary Responsibility** - Analyze and prioritize capabilities - Development	**Secondary Responsibility**
Siddharth Sohoni Primary Role: Life Cycle Planner Secondary Role: Requirements Engineer	**Primary Responsibility** - Draft life cycle plan - Assess tasks and time needed for completion	**Primary Responsibility** - Draft life cycle plan - Assess tasks and time needed for completion - Choose type of life cycle model to use for project	**Primary Responsibility** - Draft life cycle plan - Assess tasks and time needed for completion	**Primary Responsibility** - Develop Transition Plan Identify Development Iteration - Assess tasks and time needed for completion	**Primary Responsibility** - Provide Training

	Secondary Responsibility - Understand the system thoroughly. - Negotiate with clients - Prioritize win conditions	**Secondary Responsibility** - Negotiate with clients - Prioritize win conditions - Analyze whether the requirements are satisfying the client.	**Secondary Responsibility** - Complete WinWin negotiations - Do prioritization of requirements.	**Secondary Responsibility** - Check whether requirements are consistent with the development.	**Secondary Responsibility** - Check whether requirements are consistent with the development.
Suparna Dawalkar Primary Role: Feasibility Analyst Secondary Role: Software Architect	**Primary Responsibility** - Point out risk items - Track risks throughout life	**Primary Responsibility** - Analyze business case	**Primary Responsibility** - Analyze business case - Point out risk items - Track risks throughout life	**Primary Responsibility** - Point out risk items - Track risks throughout life - Propose risk mitigation methods.	**Primary Responsibility** - Point out risk items - Track risks throughout life
	Secondary Responsibility - Explore different technologies	**Secondary Responsibility** - Make UML Models mainly class diagram and system context diagram.	**Secondary Responsibility** - Propose and decide different software architecture which can be used for the project.	**Secondary Responsibility**	**Secondary Responsibility**
Priyanka Bhalerao Primary Role: Prototyper/ Developer Secondary Role: Operational Concept Engineer	**Primary Responsibility** - Analyze the system requirement.	**Primary Responsibility** - Analyze and prioritize capabilities - Develop prototype	**Primary Responsibility** - Assess prototype and components - Analyze and prioritize capabilities - Develop prototype	**Primary Responsibility** - Develop working System which will have the core functionality.	**Primary Responsibility** - Develop working System which will have the core functionality. - Documentation for the website. User manuals.
	Secondary Responsibility - Analyze Current System - Analyze time needed	**Secondary Responsibility** - Identify the constraints and risks - Analyze the proposed system	**Secondary Responsibility** - Analyze and assess the Prototype.	**Secondary Responsibility**	**Secondary Responsibility**

Anumeha Srivastava Primary Role: Operational Concept Engineer Secondary Role: Life Cycle Planner	**Primary Responsibility** - Analyze Current System - Analyze time needed	**Primary Responsibility** - Identify the constraints and risks - Analyze the proposed system	**Primary Responsibility** - Analyze and assess the Prototype.	**Primary Responsibility**	**Primary Responsibility**
	Secondary Responsibility - Understand the system thoroughly. - Negotiate with clients - Prioritize win conditions	**Secondary Responsibility** - Negotiate with clients - Prioritize win conditions - Analyze whether the requirements are satisfying the client.	**Secondary Responsibility** - Complete WinWin negotiations - Do prioritization of requirements.	**Secondary Responsibility** - Prioritize win conditions	**Secondary Responsibility**
Jeffrey Tonkovich Primary Role: IIV&V Secondary Role: System Engineer	**Primary Responsibility** - Directly interact with client to understand system - Evaluate and identify defects in deliverables	**Primary Responsibility** - Shape WinWin Evaluate and identify defects in deliverables negotiations	**Primary Responsibility** - Validate prototype is as clients requested - Evaluate and identify defects in deliverables negotiations	**Primary Responsibility** - Evaluate and identify defects in deliverables negotiations	**Primary Responsibility** - Evaluate and identify defects in deliverables negotiations
	Secondary Responsibility	**Secondary Responsibility** - Analyze proposed system - Check Feasibility of the system	**Secondary Responsibility** - Propose architecture independent of any programming language.	**Secondary Responsibility**	**Secondary Responsibility**
TBD Primary Role: Project Manager				**Primary Responsibility** - Record Project Progress. Assess Quality Management Strategy - Track Progress	**Primary Responsibility** - Assess Quality Management Strategy - Track Progress
TBD				**Primary Responsibility**	**Primary Responsibility**

Primary Role: Life Cycle Planner				- Develop Transition Plan Identify Development Iteration - Assess tasks and time needed for completion	- Provide Training
TBD Primary Role: Developer	**N/A**	**N/A**	**N/A**	**Primary Responsibility** - Prepare Glue Code - Integrate different components	**Primary Responsibility** - Transition from development environment to production environment.
TBD Primary Role: Tester	**N/A**	**N/A**	**N/A**	**Primary Responsibility** - Prepare test plan for Unit Testing and System Testing. Do Unit Testing	**Primary Responsibility** - Do system testing for delivery to the client.
TBD Primary Role: Trainer	**N/A**	**N/A**	**N/A**	**Primary Responsibility** - Prepare Training Plan	**Primary Responsibility** - Provide training to the end users.

3.3 Skills

Table 14: Skills of persons specific to different roles.

Team members	Role	Skills
Varun Brahme	Project Manager	• MS Project • MS Word • MS Excel • People Skills • Note taking abilities
	Prototyper	• Knowledge of different CMS like Drupal, Joomla and Wordpress. • Knowledge of Web Technologies like HTML, PHP, CSS, JS
Siddharth Sohoni	Life Cycle Planner	• MS Project • Familiar with WinWin Negotiations • MS Word

		• MS Excel • Note taking abilities
	Requirements Engineer	• Able to define business needs • Facilitate Prioritization • Negotiation Skills • Communication Skills
Suparna Dawalkar	Software Architect	• Knowledge in UML • Good communication skills
	Feasibility Analyst	• COCOMO/COTIPMO • Good at Investment Analysis • Quality management
Priyanka Bhalerao	Prototyper	• Knowledge of different CMS like Drupal, Joomla and Wordpress • Knowledge of Web Technologies like HTML, PHP, CSS, JS
	Operational Concept Engineer	• Knowledge of various COTS • Knowledge of various CMS • Note taking abilities. • Knowledge of Microsoft word • Knowledge of excel and power point
Anumeha Srivastava	Operational Concept Engineer	• Knowledge of various COTS • Knowledge of various CMS • Note taking abilities. • Knowledge of Microsoft word • Knowledge of excel and power point
	Life Cycle Planner	• MS Project • Familiar with WinWin Negotiations • MS Word • MS Excel • Note taking abilities
Jeffrey Tonkovich	IIV&V	• Able to find defects in the system • Note taking abilities • Bugzilla • Should have experience with formal technical writing.
	Shaper	• Able to work with Winbook • Able to categorize requirements
New Member	Project Manager	• MS Project • MS Word • MS Excel • People Skills • Note taking abilities

New Member	Life Cycle Planner	• MS Project • Familiar with WinWin Negotiations • MS Word • MS Excel • Note taking abilities
New Member	Developer	• Well versed with Drupal • Knowledge of PHP, HTML, CSS
New Member	Tester	• Knowledge of Bugzilla • Able to find defects • Able to identify the Win Conditions
New Member	Trainer	• Able to use the developed software efficiently • Good teaching abilities • Good communication skills

4. Approach

4.1 Monitoring and Control

Effort Report -
Effort report indicates the number of hours used for tasks during the project duration. It will indicate individual efforts in specific phases and particular components in the project.

Progress Report -
The project is being monitored using the Progress Report. The work done every week is logged into the progress report. It helps in controlling the flow of information and storing the knowledge better. It could help team to analyze the progress of project in past week as well as plan and adjust methods to mitigate risks and avoid defects.

MS Project Plan -
The tasks which are allocated to every team member are drafted in the Microsoft Project Plan. Use Gantt chart to show how activity proceeds in next couple weeks.

4.1.1 Closed Loop Feedback Control

The team uses Google docs to store the latest versions. It helps in version control and thus the whole team is well versed with the latest documents which are being created by different users. Various members then view the documents and then make corrections or suggest corrections which are then implemented by the document's author. There are weekly meetings every Monday and Wednesday with the client to demonstrate the progress done in that particular week. We have Skype meetings with the IIV&V every week to bring him in synchronization of the overall project progress.

4.1.2 Reviews

Peer Reviews are done by the team members. The member who has a primary role of creating a certain document creates the document and the person who has the secondary role does the peer review. In this way, both the team members are responsible for creation of an error free document. IIV&V reviews the documents and issues bugs to specific person in Bugzilla.

4.2 Methods, Tools and Facilities

Table 15: Methods, Tools and Facilities used

Tools	Usage	Provider
Google Docs	Used for versioning and configuration management.	Google
Bugzilla	Bug reporting and risk mitigation	Mozilla Foundation
Winbook	Identifying the Win Conditions and keeping a tab of issues and opinions regarding particular issues.	USC
WinWin Excel Sheet	Used for finding the priority of a certain requirement.	USC
Benefit Realization Diagram	Used for identifying the initiatives which help in realization of benefits of a system and eventually reach the goals.	ICSM
Process Decision Driver	Used for decision making about the Software Development path to be followed viz. Architected Agile, NDI, NDI Intensive, and Net Centric.	USC
COTIPMO	Used for project effort estimation.	USC
Microsoft Excel	Used for WCP, Test Cases, etc	Microsoft
Microsoft Word	Used for drafting documents	Microsoft
Adobe Flex Builder	Building Flex Components	Adobe
Drupal	Building the website framework	Drupal
Subversion	Software Version Control	Tortoise SVN

5. Resources

Estimated effort per semester -

Duration - 12 weeks in Fall 2011 and 12 weeks in Spring 2012.

- Each member works 2 hrs per day.
- There are 5 working days in week.
- Each member works 10 hrs per week.
- There are 6 members in the team.
- So weekly effort is 60 hrs.
- There are 12 weeks in the semester.
- So the total effort for the semester is 720 hours.

Total Effort for the two semesters = 720 x 2 = 1440 hours.

Budget:-

The budget as specified by the client is $5000.

Modules:-

Table 16: Modules and their severity

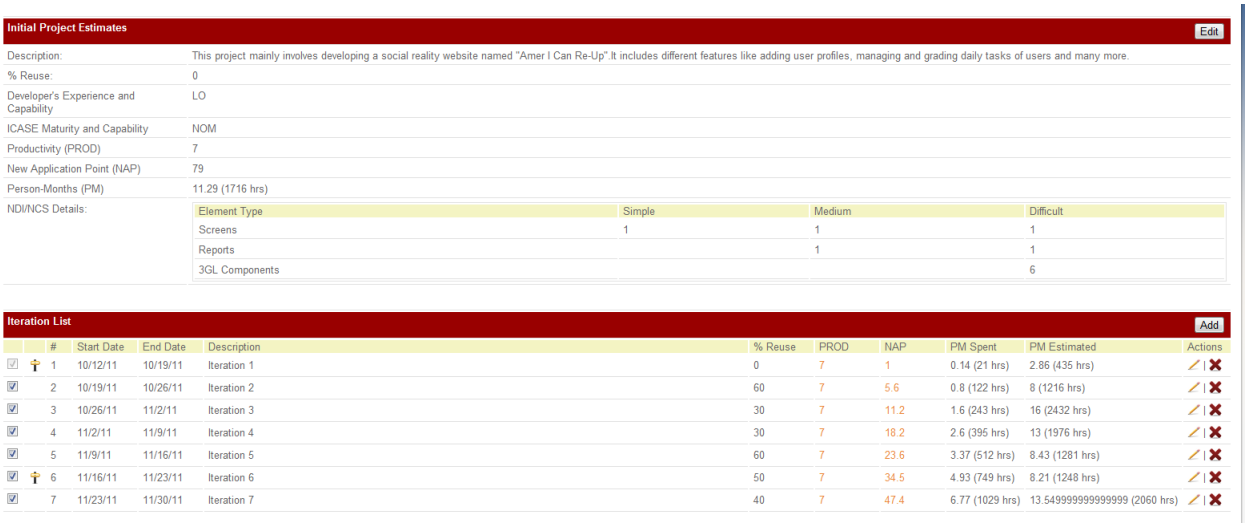
Type\Severity	Simple	Medium	Difficult
Screens	Login Page	Settings Page	Profile Page
Report		Report Card	Statistics
3GL Components			• TTBox • Motto • Statistics • Media Manager • Type to search a user.

Programming language used:-

PHP, CSS, HTML, SQL, Adobe Flex, Action Script.

COTIPMO Tool Effort Estimation -

Figure 1: Estimation of Effort using COTIPMO



Initial Project Estimates [Edit]

Description:	This project mainly involves developing a social reality website named "Amer I Can Re-Up".It includes different features like adding user profiles, managing and grading daily tasks of users and many more.
% Reuse:	0
Developer's Experience and Capability	LO
ICASE Maturity and Capability	NOM
Productivity (PROD)	7
New Application Point (NAP)	79
Person-Months (PM)	11.29 (1716 hrs)
NDI/NCS Details:	

Element Type	Simple	Medium	Difficult
Screens	1	1	1
Reports		1	1
3GL Components			6

Iteration List [Add]

	#	Start Date	End Date	Description	% Reuse	PROD	NAP	PM Spent	PM Estimated	Actions
☑	1	10/12/11	10/19/11	Iteration 1	0	7	1	0.14 (21 hrs)	2.86 (435 hrs)	
☑	2	10/19/11	10/26/11	Iteration 2	60	7	5.6	0.8 (122 hrs)	8 (1216 hrs)	
☑	3	10/26/11	11/2/11	Iteration 3	30	7	11.2	1.6 (243 hrs)	16 (2432 hrs)	
☑	4	11/2/11	11/9/11	Iteration 4	30	7	18.2	2.6 (395 hrs)	13 (1976 hrs)	
☑	5	11/9/11	11/16/11	Iteration 5	60	7	23.6	3.37 (512 hrs)	8.43 (1281 hrs)	
☑	6	11/16/11	11/23/11	Iteration 6	50	7	34.5	4.93 (749 hrs)	8.21 (1248 hrs)	
☑	7	11/23/11	11/30/11	Iteration 7	40	7	47.4	6.77 (1029 hrs)	13.549999999999999 (2060 hrs)	

Rationale for the Cost Drivers and Scale factors:-

1. % Reuse - this value is taken to be 0 since the system is a totally new system and there is no legacy code available which can be reused for creating the system.

2. Developer's Experience and Capability - this refers to the amount of experience the developer has in coding different COTS like Drupal, Joomla and Wordpress. In the team there are few members who are well versed with HTML, CSS and XML. Some team members are good at Adobe Flex. Some technologies like Drupal are not known to anyone. Thus the Value is set to LO.

3. ICASE Maturity and Capability - ICASE stands for Integrated Computer Aided Software Environment. ICASE tools are designed to provide support for all phases of the systems development. ICASE tools are:-

- Graphical Capabilities for modeling user requirements and error and consistency checking.
- Prototyping and simulation
- Code generating capability
- Testing
- Reengineering
- Management of information

The team is aware of the techniques involved in coding and testing. The team is not aware of how to model requirements and manage information efficiently. Thus taking into consideration the values of High and Low for some of the ICASE tools, the value is set NOM.

4. PROD - Productivity refers to how much output can a team member give within a specific amount of time.

5. NAP - New Application Points. These are function related measure to function points when a 3GL language is used for development.

Staffing:
Pessimistic Approach:-
We get the PM estimation of the software to be 13.54. In the pessimistic approach we consider that the total effort required will be more than estimated by the tool. The multiplication factor for that calculation is 1.25. Thus 13.54 x 1.25 = 16.28. This will be the estimation for a pessimistic approach.

Optimistic Approach:-
For the optimistic approach we assume that the developers will work with more efficiency than estimated. So they can complete the task before the estimation. This calculation factor is taken as 1.67. Thus 13.54 / 1.67 = 8.011.