

Life Cycle Plan (LCP)

**Los Angeles Child Guidance Clinic Employment Opportunities
Online Application System**

Team 5

**Hao Cai : Project Manager ,
Operational Concept Engineer, Prototyper**
Ruixin Huang : Feasibility Analyst
Zhen Huang : Quality Focal Point
Chan Li : Life Cycle Planner
Shipeng Xu : Software Architect
Cresta Kirkwood : IIV&V, Requirement Engineer

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Version History

Date	Author	Version	Changes made	Rationale
09/26/11	CL	1.0	Original template for use with ICSM v1.0	Initial draft for use with ICSM v1.0
10/4/11	CL	1.1	<ul style="list-style-type: none"> Remove template text of section Update the tables of contents, figures, and tables to reflect the new changes/additions 	The template text is just some reference and in the formal LCP document it should be removed.
10/6/11	CL	1.2	Add missing roles to the skill table.	Each team member may have multiple roles and all of them should be listed.
10/7/11	CL	1.3	Change some inappropriate statements (section 2.2: DART system; section 3.3 change wikiWinWin to Winbook)	We don't use DART and wikiWinWin in the project anymore.
10/7/11	CL	2.0	Finish section 1: Introduction of LCP.	Continue to write the document as the schedule.
10/12/11	CL	2.1	Complete the whole document.	Complete the whole document as the schedule.
10/19/11	CL	2.2	<ul style="list-style-type: none"> modify Table 6: key stakeholders responsibility in each phase modify the COCOMO estimation 	After attending the ARB, modify the plans that have mistakes
11/18/11	CL	3.0	Modify section 5: change the estimation tool from COCOMO to COTIPMO	Change the estimation tool as required.
02/04/12	CL	4.0	<ul style="list-style-type: none"> Document Personnel change Modify COTIPMO estimation Add Section 6: Iteration Plan 	<ul style="list-style-type: none"> Original project manager left Develop technology changed
02/15/12	CL	4.1	<ul style="list-style-type: none"> No Change 	
03/21/12	CL	4.2	<ul style="list-style-type: none"> update the Artifact deliverable in Development Phase update COCOMOII Cost Driver update COTIPMO result update the iteration plan, add content in 6.2 	<ul style="list-style-type: none"> Change as the grade of version 4.2
04/02/12	CL	4.3	<ul style="list-style-type: none"> update the iteration plan, add content in 6.2.1 Capabilities Implemented, Tested, and Results and 6.2.2 Core Capability Drive-Through Results 	Change according to the CCD result
04/09/12	CL	4.4	<ul style="list-style-type: none"> update the iteration plan, add content in 6.3 Adherence to plan 	Change according to the TA's feedback
04/26/12	CL	4.5	<ul style="list-style-type: none"> update the iteration plan, add content in 6.3 Adherence to plan 	Change according to the TA's feedback

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1. Introduction

1.1 Purpose of the LCP

This artifact is organized to answer the most common questions about a project or activity: why?, whereas?, what?, when?, who?, where?, how?, and how much?

This document provides information about our overall strategy, milestones, and project deliverables. It also provides the team members' skills to contribute in the project and their corresponding responsibilities. And the approaches in monitoring and controlling the projects and other approaches (tools, methods and facilities) used are described in the document as well.

1.2 Status of the LCP

The status of the LCP is currently at the AsBuilt Set version number 4.5. In this version, the iteration plan has been updated, the capabilities implemented and tested result and been documented.

1.3 Assumptions

- The duration of the project is 24 weeks, which are 12 weeks in Fall 2011 and 12 weeks in Spring 2012.
- All the team members will continue to take CSCI 577b. But unfortunately, one our team member has left us in 577b and now we have a new member.
- The project process is Architecture Agile.

2. Milestones and Products

2.1 Overall Strategy

The Los Angeles Child Guidance Clinic Employment Opportunities Online Application System is following Architected Agile process. We focus on develop a new system to fulfill the clients requirements and accomplish the other success- critical stakeholders' win conditions.

Exploration phase

Duration: 09/12/11- 09/28/11

Concept: In this phase, we explore alternatives. We identification of "Who?" are on the team and what are their roles is quite critical. We identify project operational concept, assess risks and make life cycle plan.

Deliverables: Valuation Commitment Package

Milestone: Valuation Commitment Review

Strategy: One Incremental Commitment Cycle

Valuation phase

Duration: 09/28/11- 10/24/11

Concept: In this phase, we focus on the requirement identification. We identify primary life-cycle stakeholder roles and responsibilities and life-cycle process strategy: phases and increments. We keep identify project operational concept, risks and lifecycle plan. And we start to identify system and software requirements, system and software architecture, and prototype.

Deliverables: Foundations Commitment Package

Milestone: Foundations Commitment Review

Strategy: One Incremental Commitment Cycle

Foundation phase

Duration: 10/24/11- 12/05/11

Concept: In this phase, we focus on project design. We decide the Achievable budgets and schedules with respect to the architecture in the SSAD and detailed development plans for the Development phase.

Deliverables: Development Commitment Package

Milestone: Development Commitment Review

Strategy: One Incremental Commitment Cycle

Rebaselined Foundations phase

Duration: 1/9/12- 2/15/12

Concept: Since there might be some changes during the semester break, such as team reformation, new policy from the client's organization, so, in the early weeks of Spring semester (csci577b), each team has to rebaseline the project.

Deliverables: Updated documents

Milestone: Rebaseline Development Commitment Review

Strategy: One Incremental Commitment Cycle

Development phase(Construction Iteration)

Duration: 2/16/12- 4/20/12

Concept: In this iteration, we focus on implantation of the project. The main tasks are coding and testing (unit tests, component tests and system test, acceptance test).

Deliverables: Working system, Operation Commitment Package

Milestone: Core Capability Drivethrough, Transition Readiness Review

Strategy: Two Incremental Commitment Cycle

Development phase(Transition Iteration)

Duration: 4/21/12- 5/4/12

Concept: In this phase, we focus on transition of the project. The main tasks will be training, site installation and activation.

Deliverables: Transition Package, Operation Commitment Package

Milestone: Operation Commitment Review

Strategy: One Incremental Commitment Cycle

2.2 Project Deliverables

2.2.1 Exploration Phase

Table 1: Artifacts Deliverables in Exploration Phase

Artifact	Due date	Format	Medium
Client Interaction Report	09/21/2011	.doc, .pdf	Soft copy
Valuation Commitment Package <ul style="list-style-type: none"> • Operational Concept Description (OCD) Early Section • Life Cycle Plan (LCP) Early Section • Feasibility Evidence Description (FED) Early Section 	09/28/2011	.doc, .pdf	Soft copy
Evaluation of Valuation Commitment Package		.xls	Soft copy
Individual Project effort Reports	Every Monday	Text	ER system
Project Plan	Every Wednesday	.mpp, .pdf	Soft copy
Progress Report	Every Wednesday	.xls	Soft copy

2.2.2 Valuation Phase

Table 2: Artifact deliverable in Valuation Phase

Artifact	Due date	Format	Medium
Initial prototype	09/28/2011	.doc, .pdf	Soft copy
Core Foundations Commitment Package <ul style="list-style-type: none"> • Operational Concept Description (OCD) • System and Software Requirements Description (SSRD) • Life Cycle Plan (LCP) • Feasibility Evidence Description (FED) • Supporting Information Document (SID) 	10/07/2011	.doc, .pdf	Soft copy
Draft Foundations Commitment Package <ul style="list-style-type: none"> • Operational Concept Description (OCD) • System and Software Requirements Description (SSRD) • System and Software Architecture Description (SSAD) • UML Models • Life Cycle Plan (LCP) • Feasibility Evidence Description (FED) • Supporting Information Document (SID) 	10/14/2011	.doc, .pdf	Soft copy
Foundations Commitment Package <ul style="list-style-type: none"> • Operational Concept Description (OCD) • System and Software Requirements Description (SSRD) • System and Software Architecture Description (SSAD) • UML Models • Life Cycle Plan (LCP) • Feasibility Evidence Description 	10/24/2011	.doc, .pdf	Soft copy

(FED) • Supporting Information Document (SID) • Quality Management Plan (QMP)			
Evaluation documents • Evaluation of initial prototype • Evaluation of Core Foundations Commitment Package • Evaluation of Draft Foundations Commitment Package • Evaluation of Foundations Commitment Package	10/10/2011 10/20/2011 11/03/2011	.xls	Soft copy
Response to Evaluation documents • Response to Evaluation of Core Foundations Commitment Package • Response to Evaluation of Draft Foundations Commitment Package • Response to Evaluation of Foundations Commitment Package	10/14/2011 10/24/2011 11/07/2011	.xls	Soft copy
Individual Project effort Reports	Every Monday	Text	ER system
Weekly project plans	Every Wednesday	.mpp, .pdf	Soft copy
Weekly progress reports	Every Wednesday	.xls	Soft copy

2.2.3 Foundations Phase

Table 3: Artifact deliverable in Foundations Phase

Artifact	Due date	Format	Medium
Prototypes (part of OCD)		.doc, .pdf	Soft copy
Draft Development Commitment Package (Draft DC Package) • Elaborated and updated Foundations Commitment Package	11/21/2011	.doc, .pdf	Soft copy
Development Commitment Package (DC Package) • Elaborated and updated Draft Development Commitment Package • Test Plan(TP)	12/05/2011	.doc, .pdf	Soft copy

<ul style="list-style-type: none"> • Iteration Plan(IP) • Test Plan Case(ATPC) 			
Evaluation documents <ul style="list-style-type: none"> • Evaluation of Draft Development Commitment Package • Evaluation of Development Commitment Package 		.xls	Soft copy
Response to Evaluation documents <ul style="list-style-type: none"> • Response to Evaluation of Draft Development Commitment Package 	12/05/2011	.xls	Soft copy
Individual Project effort Report	Every Monday	Text	ER system
Weekly project plan	Every Wednesday	.mpp, .pdf	Soft copy
Weekly progress report	Every Wednesday	.xls	Soft copy

Table 4: Artifact deliverable in Rebaselined Foundations Phase

Artifact	Due date	Format	Medium
Prototype (part of OCD)		.doc, .pdf	Soft copy
Draft Rebaselined Development Commitment Package (Draft RDC Package)	02/06/12	.doc, .pdf	Soft copy
Rebaselined Development Commitment Package (Draft RDC Package) <ul style="list-style-type: none"> • Elaborated and updated Draft RDC Package 	02/15/12 02/22/12	.doc, .pdf	Soft copy
Evaluation documents <ul style="list-style-type: none"> • Evaluation of Draft Rebaselined Development Commitment Package • Evaluation of Rebaselined Development Commitment Package 	02/27/12	.xls	Soft copy
Response to Evaluation documents <ul style="list-style-type: none"> • Response to Evaluation of Draft Rebaselined Development Commitment Package • Response to Evaluation of Rebaselined Development Commitment Package 		.xls	Soft copy
Individual Project effort Report	Every Monday	Text	ER system
Weekly project plan	Every Wednesday	.mpp, .pdf	Soft copy
Weekly progress report	Every Wednesday	.xls	Soft copy

2.2.4 Development Phase

Table 5: Artifact deliverable in Development Phase

Artifact	Due date	Format	Medium
Initial Operational Capability Working Set #1 <ul style="list-style-type: none"> • Quality Management Plan(QMP) • Iteration Plan (IP) • Top-level Test Plan and Cases (TPC) • Prototype (part of OCD) 	03/26/12	.doc, .pdf	Soft copy
Core Capability Drive-through (CCD) report	04/02/12	.doc, .pdf	Soft copy
Initial Operational Capability (IOC) Working Set #2 <ul style="list-style-type: none"> • Updated Quality Management Plan • Updated Iteration Plan (IP) • Updated Test Plan and Cases (TPC) • Transition Preparation Plan (TP) • Peer Review Plan (PRP) 	04/27/12	.doc, .pdf	Soft copy
Draft Transition Package <ul style="list-style-type: none"> • Transition Plan (TP) • User Manual (UM) • Support Plan (SP) • Training Materials • Regression Test Package (RTP) • Packaged Tools and Procedure (PTP) 	04/09/12	.doc, .pdf	Soft copy
Transition Package <ul style="list-style-type: none"> • Updated Draft Transition Package 	04/16/12	.doc, .pdf	Soft copy
Evaluation documents <ul style="list-style-type: none"> • Evaluation of Initial Operational Capability Working Set #1 • Evaluation of Initial Operational Capability Working Set #2 	04/04/12	.xls	Soft copy
IOC #3, TS Set <ul style="list-style-type: none"> • AsBuilt Set 	04/27/12	.doc, .pdf, .xls	Soft copy
o Operational Concept Description			

<ul style="list-style-type: none"> o System and Software Requirements Definition o System and Software Architecture Description + RSM o Life Cycle Plan o Feasibility Evidence Description o Supporting Information Document o Quality Management Plan <ul style="list-style-type: none"> • Construction Set o Test Plan and Cases o Test Procedure and Results <ul style="list-style-type: none"> • Transition and Support Set o Transition Plan o User Manual o Support Plan o Regression Test Package o Training materials (including tutorials and sample data) <ul style="list-style-type: none"> • Implementation Set o Functioning system o Release Description 			
Individual Project effort Reports	Every Monday	Text	ER system
COTIPMO	Every next Wednesday	Text	COTIPMO system
Weekly project plans	Every Wednesday	.mpp, .pdf	Soft copy
Weekly progress reports	Every Wednesday	.xls	Soft copy

3. Responsibilities

3.1 Project-specific stakeholder's responsibilities

All success critical stakeholders are responsible to participate in the WinWin negotiation, weekly meeting, and commitment review, collaborating on the project's risk issues and performing assigned tasks, as well as to commit to the project progress.

For the clients/users of the project, their responsibilities are listed as below:

Table 6: Stakeholder's Responsibilities in each phase - Clients

Team Member / Role	Primary / Secondary Responsibility				
	Exploration	Valuation	Foundations	Development-Construction Iteration	Development-Transition Iteration
Teresa: Client, User	Primary Responsibility <ul style="list-style-type: none"> Identify Objectives, Constraints and Priorities Provide the information of current system 	Primary Responsibility <ul style="list-style-type: none"> Establish New Operational Concept Assess Prototype and Components 	Primary Responsibility <ul style="list-style-type: none"> Keep tracking the project 	Primary Responsibility <ul style="list-style-type: none"> Assess Development Iteration Secondary Responsibility <ul style="list-style-type: none"> Develop Transition Plan 	Primary Responsibility <ul style="list-style-type: none"> Identify Organizational and Operational Transformation Secondary Responsibility <ul style="list-style-type: none"> Develop Support Plan
Rick: Client, User	Primary Responsibility <ul style="list-style-type: none"> Identify Objectives, Constraints and Priorities Provide the information of current system 	Primary Responsibility <ul style="list-style-type: none"> Establish New Operational Concept Assess Prototype and Components 	Primary Responsibility <ul style="list-style-type: none"> Keep tracking the project 	Primary Responsibility <ul style="list-style-type: none"> Assess Development Iteration Secondary Responsibility <ul style="list-style-type: none"> Develop Transition Plan 	Primary Responsibility <ul style="list-style-type: none"> Identify Organizational and Operational Transformation Secondary Responsibility <ul style="list-style-type: none"> Develop Support Plan
Jerry: Client, Maintainer, User	Primary Responsibility <ul style="list-style-type: none"> Identify Objectives, Constraints and Priorities Provide the information of current system 	Primary Responsibility <ul style="list-style-type: none"> Establish New Operational Concept Assess Prototype and Components 	Primary Responsibility <ul style="list-style-type: none"> Keep tracking the project 	Primary Responsibility <ul style="list-style-type: none"> Familiar with the product Secondary Responsibility <ul style="list-style-type: none"> Develop Transition Plan Assess 	Primary Responsibility <ul style="list-style-type: none"> Identify Organizational and Operational Transformation Secondary Responsibility

				Development Iteration	• Develop Support Plan
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3.2 Responsibilities by Phase

Due to some reason, Tianhu Yang, our original project manager has to left our team. And Hao Cai became our new project manager. We also have a new member: Zhen Huang, who will perform as a builder, tester and Quality Focal Point

Table 7: Stakeholder's Responsibilities in each phase- Development team

Team Member / Role	Primary / Secondary Responsibility				
	Exploration	Valuation	Foundations	Development-Construction Iteration	Development-Transition Iteration
Tianhu Yang: Project Manager, Quality Focal Point, Builder, Tester (Left the team.)	Primary Responsibility <ul style="list-style-type: none"> Identify project activities Assign project resources Record Project Progress Plan and manage project 	Primary Responsibility <ul style="list-style-type: none"> Identify project activities Assign project resources Record Project Progress Secondary Responsibility <ul style="list-style-type: none"> Assess Quality Management Strategy Identify Quality Management Strategy 	Primary Responsibility <ul style="list-style-type: none"> Identify project activities Assign project resources Record Project Progress Secondary Responsibility <ul style="list-style-type: none"> Identify Configuration Management Strategy 		
Ruixin Huang: Feasibility Analyst, Builder	Primary Responsibility <ul style="list-style-type: none"> Analyze Business Case Plans to Mitigate Risks Assess Feasibility Evidence 	Primary Responsibility <ul style="list-style-type: none"> Analyze Business Case Assess and Plans to Mitigate Risks Assess Feasibility Evidence Provide Process Feasibility Evidence Explore Alternatives 	Primary Responsibility <ul style="list-style-type: none"> Provide Feasibility Evidence for Architecture Agile project Assess Feasibility Evidence 	Primary Responsibility <ul style="list-style-type: none"> Develop Components Integrate Components Secondary Responsibility <ul style="list-style-type: none"> Assess Feasibility Evidence 	Primary Responsibility <ul style="list-style-type: none"> Prepare operational environment

Hao Cai: Operational Concept Engineer, Prototyper, Builder, Project Manager	Primary Responsibility <ul style="list-style-type: none"> Analyze Current System Assess Operational Concept Establish New Operational Concept Explore Alternatives Identify Objectives, Constraints and Priorities Analyze the Proposed System Identify Shared Vision Secondary Responsibility <ul style="list-style-type: none"> Establish New Operational Concept 	Primary Responsibility <ul style="list-style-type: none"> Analyze Current System Assess Operational Concept Establish New Operational Concept Explore Alternatives Analyze the Proposed System Identify Organizational and Operational Transformation Secondary Responsibility <ul style="list-style-type: none"> Develop Prototype Analyze and Prioritize Capabilities to Prototype Assess Prototype and Components 	Primary Responsibility <ul style="list-style-type: none"> Analyze Current System Assess Operational Concept Secondary Responsibility <ul style="list-style-type: none"> Prepare development / production environment 	Primary Responsibility <ul style="list-style-type: none"> Develop Components Integrate Components Assess Development Iteration Assess Life Cycle Content 	Primary Responsibility <ul style="list-style-type: none"> Prepare operational environment Secondary Responsibility <ul style="list-style-type: none"> Assess Life Cycle Content Develop Support Plan
Chan Li: Life Cycle Planner, UML Modeler, Builder, Tester	Primary Responsibility <ul style="list-style-type: none"> Identify Responsibilities and Skills 	Primary Responsibility <ul style="list-style-type: none"> Plan and manage process Plan for project lifecycle Assess Life Cycle Content Estimate Project Effort and Schedule using COCOMO II Identify Life Cycle Management Approach Identify Milestones and Products Provide Process 	Primary Responsibility <ul style="list-style-type: none"> Assess Life Cycle Content Identify Development Iteration Secondary Responsibility <ul style="list-style-type: none"> Develop Test Plan and test case 	Primary Responsibility <ul style="list-style-type: none"> Develop Components Integrate Components Perform unit/integration/system/acceptance/performance tests Develop Transition Plan Develop Transition Plan Perform unit/integration/system/acceptance/performance 	Primary Responsibility <ul style="list-style-type: none"> Prepare operational environment Secondary Responsibility <ul style="list-style-type: none"> Assess Life Cycle Content Develop Support Plan

		Feasibility Evidence Secondary Responsibility <ul style="list-style-type: none"> Analyze the Proposed System Assess System Architecture Define Technology-Independent Architecture 		tests Secondary Responsibility <ul style="list-style-type: none"> Assess Development Iteration Assess Life Cycle Content 	
Shipeng Xu: Software Architect, Operational Concept Engineer, Builder, Trainer	Primary Responsibility <ul style="list-style-type: none"> Analyze Current System Assess Operational Concept Establish New Operational Concept Explore Alternatives Identify Objectives, Constraints and Priorities Analyze the Proposed System Identify Shared Vision 	Primary Responsibility <ul style="list-style-type: none"> Specify Architecture Styles, Patterns and Frameworks Provide Feasibility Evidence for Architecture Agile project Assess System Architecture Define Technology-Independent Architecture Define Technology-Dependent Architecture Analyze the Proposed System Secondary Responsibility <ul style="list-style-type: none"> Analyze Current System Assess Operational Concept Establish New Operational Concept Explore Alternatives Analyze the Proposed System Identify 	Primary Responsibility <ul style="list-style-type: none"> Analyze Current System Assess Operational Concept 	Primary Responsibility <ul style="list-style-type: none"> Develop Components Integrate Components Secondary Responsibility <ul style="list-style-type: none"> Develop Training Plan 	Primary Responsibility <ul style="list-style-type: none"> Prepare operational environment Train Users , Clients or maintainers

		Organizational and Operational Transformation			
Cresta Kirkwood: IIV&V, Requirement Engineer, Quality Focal Point, Shaper, Tester	Primary Responsibility <ul style="list-style-type: none"> • Verify and Validate Work Products Using Issue (Defect) Tracking System 	Primary Responsibility <ul style="list-style-type: none"> • Verify and Validate Work Products Using Issue (Defect) Tracking System Secondary Responsibility <ul style="list-style-type: none"> • Develop Requirements Definition • Assess requirements definition • Assess Quality Management Strategy • Identify Quality Management Strategy • Set up WinWin negotiation context • Negotiate WIOA 	Primary Responsibility <ul style="list-style-type: none"> • Verify and Validate Work Products Using Issue (Defect) Tracking System Secondary Responsibility <ul style="list-style-type: none"> • Identify Configuration Management Strategy Secondary Responsibility <ul style="list-style-type: none"> • Develop Test Plan and test case 	Primary Responsibility <ul style="list-style-type: none"> • Assess Operational Concept • Perform unit/integration/system/acceptance/performance tests • Verify and Validate Work Products Using Issue (Defect) Tracking System 	Primary Responsibility <ul style="list-style-type: none"> • Assess Operational Concept • Verify and Validate Work Products Using Issue (Defect) Tracking System
Zhen Huang: Builder, Tester, Quality Focal Point (New Member)				Primary Responsibility <ul style="list-style-type: none"> • Develop Components • Integrate Components • Perform unit/integration/system/acceptance/performance tests • Develop Transition Plan Secondary Responsibility <ul style="list-style-type: none"> • Assess Quality Management Strategy 	Primary Responsibility <ul style="list-style-type: none"> • Prepare operational environment

3.3 Skills

Table 8: Team members' skills

Team members	Role	Skills
Tianhu Yang(Left team)	Project Manager, Builder, Tester	Project management, UML, SQL, javascript, html, Java
Ruixin Huang	Feasibility Analyst, Quality Focal Point, Builder, Tester	UML,SQL Server, HTML, COCOMO, Quality Management
Hao Cai	Operational Concept Engineer, Prototyper, Builder, Tester	UML, SQL Server, EJB, C#, Rational Software Modeler, Analysis skill
Chan Li	Life Cycle Planner, UML Modeler, Builder, Tester	COCOMO, SQL Server, javascript, UML, Project coordination, Microsoft Project, Rational Software Modeler
Shipeng Xu	Software Architect, Operational Concept Engineer, Builder, Tester	UML, AJAX, Asp. Net, C#, COCOMO, Analysis skill, Rational Software Modeler,
Cresta Kirkwood	IIV&V, Requirement Engineer, Quality Focal Point, Shaper	Winbook, Project coordination, COCOMO, Rational Software Modeler, Communication skill, negotiation skill
Zhen Huang(new member)	Builder,Tester, Quality Focal Point	<ul style="list-style-type: none"> - Analyze feasibility evidence - Understand system architecture and process well - Assess and evaluate NDI / Services (candidate) <ul style="list-style-type: none"> : should know what kind of services can be used for project : should know Hardware / Software information well - Analyze what benefits can be occurred by our project well

4. Approach

4.1 Monitoring and Control

The approach our team use to monitor and control the project is :

- Weekly progress reports
- Weekly project plans
- Weekly effort reports

4.1.1 Closed Loop Feedback Control

- Weekly team meetings allow team members discuss what they have done in the previous week and what they will do in the week. By doing so, team members are informed the work others have done and control the whole process.
- The weekly effort and progress reports identify the activities undertaken and completed in the week. The MS Project plan provides the baseline for the activities. Any deviation from this base line is identified, its severity is analyzed and action, as appropriate, is taken. This may include revision of the activities planned for next week at one end to revision of the entire plan at the extreme end.

4.1.2 Reviews

The Reviews that our team uses to control the project are listed below:

- Architecture Review Boards
- TA check
- Core Capability Drive-through
- IV&V reviews

4.2 Methods, Tools and Facilities

Table 9: Methods, Tools and Facilities

Tools	Usage	Provider
Microsoft Word 2003/2007/2010	Constructs documents for all artifacts.	USC
Microsoft Project 2003/2007/2010	Creates Gantt charts for Progress reports and LCP	USC
Microsoft PowerPoint	Creates presentation for client meeting and ARB reviews	USC

2003/2007/2010		
Internet Explorer and Mozilla Firefox	Downloads course material and medium for communication among stakeholders	USC
Winbook	Facilitates and supports Win-Win negotiation	USC
Rational Software Architect V6.0	Creates UML, sequence diagram, and other diagrams for SSAD	USC
COCOMO II tool	Conduct the cost analysis; Estimate Project Effort and Schedule	USC
COTIPMO	Track project progress, conduct project estimation and team assessment.	USC
Bugzilla	Track and manage the bugs during the process.	USC
Pencil	Create Prototype.	developer
Macromedia Dream Weaver	Develops team website	developer
Adobe Acrobat 6.0	Used for documentation dissemination	developer
ER and iCard System	Keeps track of project effort	USC
MySQL	DBMS	developer
EasyEclipse for PHP	Develops project using PHP(symfony)	developer

5. Resources

Table 10: COCOMOII Scale Driver

Scale Driver	Value	Rationale
PREC	High	The system is similar to many other application websites which have been developed before.
FLEX	Nominal	As an application website, the project has some clear requirements defined by clients.
RESL	High	As the lifecycle process is ICSM, Risk resolution is done extensively throughout the project life-cycle.
TEAM	High	The stakeholders have mutual willingness to cooperate to accomplish the success of the project.
PMAT	Nominal	We will just develop the project as the ICSM. And the CMMI level of the project should remain in level 2.

Table 11: COCOMOII Cost Driver

Cost Driver	Value	Rationale
RELY	Low	As an application website, the software failure of this project will just cause some inconveniences and easily recovered.
DATA	Nominal	As a simple application system, the ratio of bytes in the test database to SLOC in the program should be nominal.
CPLX	Low, Except ApplyOnLine which is Low+50%	There are no direct hardware operations and complex data structure designs in the project. It is just simple read/ write/modify operations. But the CPLX of Application module should be a little higher because the type of application varies.
RUSE	Low+50%	This system is an independent project rather than a part of a product chain. Maybe reuse across some modules in the project.
DOCU	Nominal	As a course project, we write and maintain the documentations as the schedule.
TIME	Nominal	Time constraints for the system should be within reasonable limits.
STOR	Nominal	There is no specific constrain to the storage in the system.
PVOL	Nominal	There is no specific constrain to the platform in the system.
ACAP	Nominal	All students have some project experiences, so they have some capabilities to analysis the system.

PCAP	Low+50%	Developers are all students, so the capability of programmers as a team should be between low and nominal.
PCON	High	All except one of the developers will stay with the project whole year. And other stakeholders will do the same.
APEX	Nominal+50%	Some team members have developed some similar projects before.
PLEX	Nominal	All team members have some experience on eclipse, MySQL and other platforms.
LTEX	Low+50%	All the developers don't have experience on developing using PHP, not to mention Symfony.
TOOL	Nominal	Basic life-cycle tools, moderately integrated.
SITE	High	As a project developed by on-campus student, most of the development are in the same location.
SCED	Nominal	As a project of a class, we should develop according the schedule.

The screenshot of COTIPMO estimation results:

Iteration List										Add
	#	Start Date	End Date	Description	Scale Factor	Modules	Spent PM	Estimated PM	Actions	
<input checked="" type="checkbox"/>	1	10/19/11	10/26/11	Our team have finished the VC Package and draft FC Package, and successfully met with clients and retrieved the requirement several times.	15.22	3	-	9.01 (1370 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	2	10/25/11	11/1/11	Our team have attended to the ARB successfully and submitted the FCP.	15.22	3	-	7.23 (1099 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	3	11/1/11	11/8/11	In this week, we have finished the evaluation of FC package. And we will give the response to the corresponding evaluation.	15.22	3	-	8.00 (1216 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	4	11/9/11	11/15/11	We will focus on the Architecture of the system in this iteration.	15.22	3	-	8.00 (1216 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	5	11/15/11	11/22/11	In this week, we will focus on the architecture design of the system and work on the draft DC package.	15.22	3	-	8.00 (1216 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	6	11/23/11	11/30/11	In this iteration, we will continue working on the DC package. And we will prepare for the ARB.	15.22	4	0.16 (24 hrs)	7.06 (1074 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	7	11/30/11	12/6/11	In this week, we will attend the DCR ARB and continue on Foundation phase documenting.	15.22	4	0.37 (56 hrs)	6.29 (956 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	8	11/11/07	11/11/14	In this iteration, we will perform the project archiving.	15.22	4	0.34 (52 hrs)	7.38 (1121 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	9	1/9/12	2/1/12	In this iteration, the development phase has been started, the development framework and language have been decided too, we started to develop each module according to our tasks.	15.22	5	0.58 (88 hrs)	6.15 (935 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	10	2/1/12	2/15/12	In this iteration, the develop team continue learning PHP and Symfony. And the prototype is developed and enriched.	15.22	5	0.98 (149 hrs)	5.00 (760 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	11	2/15/12	3/1/12	In this iteration, We entered the construction iteration #1 to develop the system. Development team keep develop the project.	15.22	5	2.22 (337 hrs)	3.40 (517 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	12	3/1/12	3/21/12	Development team keep develop the project.	15.22	5	2.83 (430 hrs)	4.37 (664 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	13	3/21/12	4/4/12	In this iteration, we will attend the CCD and submit the IOC #1. And the development team keeps developing the project.	15.22	5	2.93 (445 hrs)	4.84 (736 hrs)	✍ ✖	
<input checked="" type="checkbox"/>	14	12/4/04	12/4/25	In this iteration, we kept improving our UI and attend to the TRR ARB.	15.22	5	4.18 (635 hrs)	4.84 (736 hrs)	✍ ✖	

Figure1. COTIPMO Iteration List

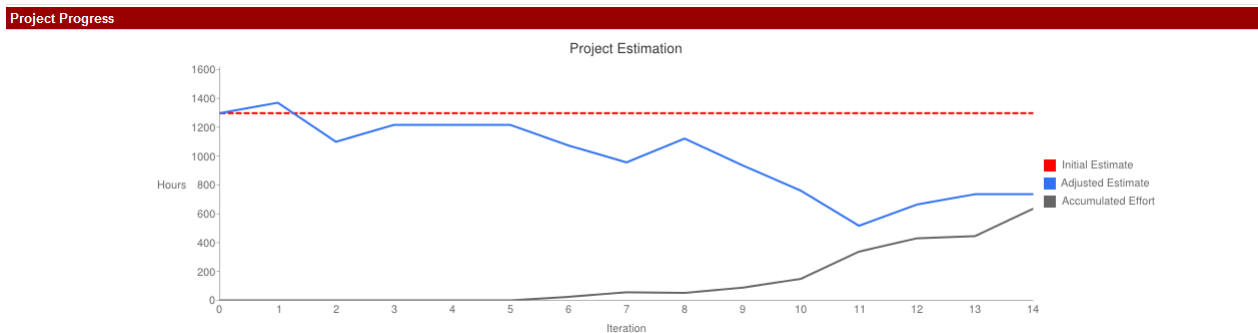


Figure2. COTIPMO Project Estimation

Scale Factors:

Scale Factor Edit the scale factors

15.22

Cancel Save

Precedentedness: HI 0%

Development Flexibility: NOM 0%

Architecture/Risk Resolution: HI 0%

Team Cohesion: HI 0%

Process Maturity: NOM 0%

Figure3. COTIPMO estimation result – Scale Factors

EAF:

Effort Adjust Factors

0.69

Cancel Save

Product: RELY DATA DOCU CPLX RUSE

LO NOM NOM LO LO

0% 0% 0% 0% 50%

Platform: TIME STOR PVOL

NOM NOM NOM

0% 0% 0%

Personnel: ACAP PCAP PCON APEX PLEX LTEX

NOM LO HI NOM NOM LO

0% 50% 0% 50% 0% 50%

Project: TOOL SITE SCED

NOM HI NOM

0% 0% 0%

Figure4. COTIPMO estimation result – EAF

Effort Adjust Factors

0.74 Cancel Save

Product:	RELY	DATA	DOCU	CPLX	RUSE	
	LO	NOM	NOM	LO	LO	
	0%	0%	0%	50%	50%	
Platform:	TIME	STOR	PVOL			
	NOM	NOM	NOM			
	0%	0%	0%			
Personnel:	ACAP	PCAP	PCON	APEX	PLEX	LTEX
	NOM	LO	HI	NOM	NOM	LO
	0%	50%	0%	50%	0%	50%
Project:	TOOL	SITE	SCED			
	NOM	HI	NOM			
	0%	0%	0%			

Figure5. COTIPMO estimation result – EAF (for ApplyOnLine)

Analysis of COTIPMO estimation

According to the COTIPMO analysis result, the staff is most likely 5.1(8.53 / 1.67) which means that it needs about 5 people to complete this project within 24 weeks. And it is consistence with the reality situation. So we can perform this project as the plan suggests.

6. Iteration Plan

6.1 Plan

There are 3 iterations planned in the Development phase of the Los Angeles Child Guidance Clinic Employment Opportunities Online Application System. Estimated dates are as follows:

- construction iteration 1: 2/16/12-03/23/12
- construction iteration 2: 03/24/12- 4/20/12
- transition iteration: 4/21/12- 5/4/12

During the first increment of construction iteration the fundamental features will be developed, to be more specific, we will complete all the "Must Have" and "Should Have" capabilities and 10 out of 13 "Could Have" and 1 out of 6 "Want to Have" capabilities. But because of the clients have not determined how to collect data from EEOC form, CR -5 have to be moved to construction iteration 2 to develop.

The second increment of the construction iteration will be developing the remaining “could have” and "want to have" capabilities and CR-5 to improvement the performance of the system.

The transition iteration is accountable for the transition of the executable system to the client’s production server and training of the users, client and maintainers.

The approach our team use to monitor and control the project is :

- Weekly progress reports
- Weekly project plans
- Weekly effort reports

6.1.1 Capabilities to be implemented

Capabilities to be implemented in Construction iteration 1 are shown at Table 12.

- Table 22: Construction iteration 1 capabilities to be implemented

ID(CR-#)	Requirement Name	Description	Priority	Increment
CR - 1	Internal query and display	The system shall allow HR Supervisors and HR staff the ability to query by position, date, category, degree, status and name.	M (Must have)	1
CR - 2	Applicant attachments	The system shall give applicants the ability to attach a copy of driver's	C (Could have)	1

		licenses, resumé's, degrees, and board registrations		
CR - 3	Attachment download	The system shall give HR Staff and hiring the ability to download attachments to any applicant's application	C (Could have)	1
CR - 4	System Reports	The system shall give assistants the ability to generate reports from the data and export the reports into Microsoft Excel	S (Should have)	1
CR - 5 (moved to iteration 2)	EEOC Generation	The system shall generate EEOC forms to each position based on database information	M (Must have)	1
CR - 6	Application/Position Status	The system shall allow hiring managers and only hiring managers to update the status of each applicant's application to a position	S (Should have)	1
CR - 7	Applicant/Employment Category	The system shall allow HR staff and only HR staff users to change the category of the applicant	S (Should have)	1
CR - 8	Add a Job Post	The system shall allow HR staff users to add a new job post	M (Must have)	1
CR - 9	Edit a Job Post	The system shall allow HR staff users to edit existing job posts	M (Must have)	1
CR - 10	Remove an Old Post	The system shall allow HR staff users to remove old posts	M (Must have)	1
CR - 11	One or more user applications	The system shall allow applicants to apply to one or more job posts at a time	S (Should have)	1
CR - 12	Applicant/HR/IT Login	The system shall allow applicants, HR and IT to log into the system	M (Must have)	1
CR - 13	Distinct Applicant /HR /IT Roles	The system shall visually and operationally distinguish between the applicant, HR, and IT roles	C (Could have)	1
CR - 14	Applicant/HR/IT Logout	The system shall allow applicants, HR and IT to log out of the system	M (Must have)	1
CR - 15	View applicant application	The system shall allow HR staff to view applications. The system shall allow HR	M (Must have)	1

		managers to view applications which have "Qualified"		
CR - 16 (moved to iteration 2)	Download applicant application	The system shall allow HR staff and HR hiring managers to download an application	M (Must have)	1
CR - 17	Search user profiles	The system shall allow HR staff to search for user profile.	C (Could Have)	1
CR - 18	Delete a user profile	The system shall allow IT staff to delete internal user profiles	S (Should have)	1
CR - 19	Internal account creation	The system shall allow IT, HR staff, and HR managers to create accounts with IT, HR staff and/role HR manager roles and privileges as appropriate depending on their role	S (Should have)	1
CR - 20	External account creation	The system shall allow applicants to create their own user account	M (Must have)	1
CR - 21	Reset password	The system shall allow a user to recover or reset his password	C (Could have)	1
CR - 22	Recover password	The system shall allow a user to recover his password	C (Could have)	1
CR - 23 (removed)	Unlock Account	The system shall allow IT to unlock locked accounts	S (Should have)	1
CR - 24 (removed)	Request account unlock	The system shall allow a user to request that his account be unlocked	S (Should have)	1
CR - 25 (moved to iteration 2)	Modify User Roles	The system shall allow IT and HR staff users to modify user roles	C (Could have)	1
CR - 26	Applicant Privileges	The system shall grant applicants the ability to apply online, add attachments and update the name, address, and contact information in their profile	S (Should have)	1
CR - 27	View Account	The system shall grant applicants the ability to view their profile information	S (Should Have)	1

CR - 28 (moved to iteration 2)	User Profile Expiration	The system shall automatically cause user profiles to expire after a period of time which shall be configurable by the System Administrators	C (Could Have)	1
CR - 29 (duplicate to CR-41, removed)	Prevent Single Person / Multiple User Accounts	The system shall restrict users from making multiple accounts by requiring a social security number to create an account.	C (Could have)	1
CR - 30	Hiring manager query restriction	Hiring manager query results shall be restricted to those candidates that are marked as "Qualified" or Employee	M (Must have)	1
CR - 33 (partial finished, moved to iteration 2)	Input validation	The system shall validate user input on the client side and on the server side	C (Could have)	1
CR - 39 (removed)	Single Sign-On	The system shall allow LACGC users (HR, IT) to log in to the system using their windows login information when on the intranet and when on the internet	W (Want to have)	1
CR - 41	Prevent Single Person / Multiple User Accounts using email addresses	The system shall require an email address that is unique to the system when creating user accounts in order to restrict users from making multiple accounts	S (Should have)	1

Capabilities to be implemented in Construction iteration 2 are shown at Table 13.

Table 33: Construction iteration 2 capabilities to be implemented

ID(CR-#)	Requirement Name	Description	Priority	Increment
CR - 5	EEOC Generation	The system shall generate EEOC forms to each position based on database information	M (Must have)	2
CR - 13	Distinct Applicant /HR /IT Roles	The system shall visually and operationally distinguish between the applicant, HR, and IT roles	C (Could have)	2
CR - 16	Download applicant	The system shall allow HR	M (Must)	2

	application	staff and HR hiring managers to download an application	have)	
CR - 25	Modify User Roles	The system shall allow IT and HR staff users to modify user roles	C (Could have)	2
CR - 28	User Profile Expiration	The system shall automatically cause user profiles to expire after a period of time which shall be configurable by the System Administrators	C (Could Have)	2
CR - 31	Data Archival	The textual data in the system shall be capable of being archived using standard database archival methods.	C (Could have)	2
CR - 32	Strong Passwords	The system shall require users to use strong passwords to create user accounts	W (Want to have)	2
CR - 33	Input validation	The system shall validate user input on the client side and on the server side	C (Could have)	2
CR - 34	Input Sanitization	The system shall validate all user input, escape special characters on valid user input, and escape special characters in system output to prevent potential security breaches	C (Could have)	2
CR -35	Sensitive Information Database Storage	The system shall store passwords and any other sensitive authentication information in an encrypted format	C (Could have)	2
CR -36	Sensitive Information Filesystem Storage	The system shall store uploaded files in an encrypted format	W (Want to have)	2
CR -37	Sensitive Data Display	If a system error occurs, the system shall not display specific technical information to the user, such as Java stack traces, source code, variable values, etc., all of which would be considered security-sensitive information. Instead the system shall display a user-friendly error message	W (Want to have)	2
CR -38	Automatic Account Lock	The system shall lock accounts after 4 unsuccessful	W (Want to have)	2

		attempts to log in		
CR - 40	Federated Search	The system shall provide the ability for HR Staff and IT users to add a row to the database so that the user id for an account of a newly hired employee will be related to the employee id in the HR database. In other words, there will be a table with at least two columns where each row would have an application system account id and the employee ID from the database. This will allow for federated queries across the two systems	W (Want to have)	2

6.1.2 Capabilities to be tested

Capabilities to be tested in Construction iteration 1 are shown at Table 14.

Table 14: Construction iteration 1 capabilities to be tested

ID(CR-#)	Requirement Name	Description	Priority	Increment
CR - 1	Internal query and display	The system shall allow HR Supervisors and HR staff the ability to query by position, date, category, degree, status and name.	M (Must have)	1
CR - 2	Applicant attachments	The system shall give applicants the ability to attach a copy of driver's licenses, resumés, degrees, and board registrations	C (Could have)	1
CR - 3	Attachment download	The system shall give HR Staff and hiring the ability to download attachments to any applicant's application	C (Could have)	1
CR - 4	System Reports	The system shall give assistants the ability to generate reports from the data and export the reports into Microsoft Excel	S (Should have)	1
CR - 5 (moved to iteration 2)	EEOC Generation	The system shall generate EEOC forms to each position based on database information	M (Must have)	1

CR - 6	Application/Position Status	The system shall allow hiring managers and only hiring managers to update the status of each applicant's application to a position	S (Should have)	1
CR - 7	Applicant/Employment Category	The system shall allow HR staff and only HR staff users to change the category of the applicant	S (Should have)	1
CR - 8	Add a Job Post	The system shall allow HR staff users to add a new job post	M (Must have)	1
CR - 9	Edit a Job Post	The system shall allow HR staff users to edit existing job posts	M (Must have)	1
CR - 10	Remove an Old Post	The system shall allow HR staff users to remove old posts	M (Must have)	1
CR - 11	One or more user applications	The system shall allow applicants to apply to one or more job posts at a time	S (Should have)	1
CR - 12	Applicant/HR/IT Login	The system shall allow applicants, HR and IT to log into the system	M (Must have)	1
CR - 13	Distinct Applicant /HR /IT Roles	The system shall visually and operationally distinguish between the applicant, HR, and IT roles	C (Could have)	1
CR - 14	Applicant/HR/IT Logout	The system shall allow applicants, HR and IT to log out of the system	M (Must have)	1
CR - 15	View applicant application	The system shall allow HR staff to view applications. The system shall allow HR managers to view applications which have "Qualified"	M (Must have)	1
CR - 16 (moved to iteration 2)	Download applicant application	The system shall allow HR staff and HR hiring managers to download an application	M (Must have)	1
CR - 17	Search user profiles	The system shall allow HR staff to search for user profile.	C (Could Have)	1
CR - 18	Delete a user profile	The system shall allow IT staff to delete internal user profiles	S (Should have)	1
CR - 19	Internal account creation	The system shall allow IT, HR staff, and HR	S (Should	1

		managers to create accounts with IT, HR staff and role HR manager roles and privileges as appropriate depending on their role	have)	
CR - 20	External account creation	The system shall allow applicants to create their own user account	M (Must have)	1
CR - 21	Reset password	The system shall allow a user to recover or reset his password	C (Could have)	1
CR - 22	Recover password	The system shall allow a user to recover his password	C (Could have)	1
CR - 23 (removed)	Unlock Account	The system shall allow IT to unlock locked accounts	S (Should have)	1
CR - 24 (removed)	Request account unlock	The system shall allow a user to request that his account be unlocked	S (Should have)	1
CR - 25 (moved to iteration 2)	Modify User Roles	The system shall allow IT and HR staff users to modify user roles	C (Could have)	1
CR - 26	Applicant Privileges	The system shall grant applicants the ability to apply online, add attachments and update the name, address, and contact information in their profile	S (Should have)	1
CR - 27	View Account	The system shall grant applicants the ability to view their profile information	S (Should Have)	1
CR - 28 (moved to iteration 2)	User Profile Expiration	The system shall automatically cause user profiles to expire after a period of time which shall be configurable by the System Administrators	C (Could Have)	1
CR - 29 (duplicate to CR-41, removed)	Prevent Single Person / Multiple User Accounts	The system shall restrict users from making multiple accounts by requiring a social security number to create an account.	C (Could have)	1
CR - 30	Hiring manager query restriction	Hiring manager query results shall be restricted to those candidates that are	M (Must have)	1

		marked as "Qualified" or Employee		
CR - 33 (partial finished, (moved to iteration 2))	Input validation	The system shall validate user input on the client side and on the server side	C (Could have)	1
CR - 39 (removed)	Single Sign-On	The system shall allow LACGC users (HR, IT) to log in to the system using their windows login information when on the intranet and when on the internet	W (Want to have)	1
CR - 41	Prevent Single Person / Multiple User Accounts using email addresses	The system shall require an email address that is unique to the system when creating user accounts in order to restrict users from making multiple accounts	S (Should have)	1

Capabilities to be tested in Construction iteration 2 are shown at Table 15.

Table 15: Construction iteration 2 capabilities to be tested

ID(CR-#)	Requirement Name	Description	Priority	Increment
CR - 5	EEOC Generation	The system shall generate EEOC forms to each position based on database information	M (Must have)	2
CR - 13	Distinct Applicant /HR /IT Roles	The system shall visually and operationally distinguish between the applicant, HR, and IT roles	C (Could have)	2
CR - 16	Download applicant application	The system shall allow HR staff and HR hiring managers to download an application	M (Must have)	2
CR - 25	Modify User Roles	The system shall allow IT and HR staff users to modify user roles	C (Could have)	2
CR - 28	User Profile Expiration	The system shall automatically cause user profiles to expire after a period of time which shall be configurable by the System Administrators	C (Could Have)	2
CR - 31	Data Archival	The textual data in the system shall be capable of being archived using standard database archival	C (Could have)	2

		methods.		
CR - 32	Strong Passwords	The system shall require users to use strong passwords to create user accounts	W (Want to have)	2
CR - 33	Input validation	The system shall validate user input on the client side and on the server side	C (Could have)	2
CR - 34	Input Sanitization	The system shall validate all user input, escape special characters on valid user input, and escape special characters in system output to prevent potential security breaches	C (Could have)	2
CR -35	Sensitive Information Database Storage	The system shall store passwords and any other sensitive authentication information in an encrypted format	C (Could have)	2
CR -36	Sensitive Information Filesystem Storage	The system shall store uploaded files in an encrypted format	W (Want to have)	2
CR -37	Sensitive Data Display	If a system error occurs, the system shall not display specific technical information to the user, such as Java stack traces, source code, variable values, etc., all of which would be considered security-sensitive information. Instead the system shall display a user-friendly error message	W (Want to have)	2
CR -38	Automatic Account Lock	The system shall lock accounts after 4 unsuccessful attempts to log in	W (Want to have)	2
CR - 40	Federated Search	The system shall provide the ability for HR Staff and IT users to add a row to the database so that the user id for an account of a newly hired employee will be related to the employee id in the HR database. In other words, there will be a table with at least two columns where each row would have an application system account id and the employee ID from the database. This	W (Want to have)	2

		will allow for federated queries across the two systems		
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6.1.3 Capabilities/requirements not to be tested

All capabilities listed above in Table 14 and 15 will be tested.

6.2 Iteration Assessment

During the CCD, the clients have tried the system the develop team have accomplished so far. The condition about the planned to be implemented capabilities in construction iteration 1 and the feedbacks from clients are shown below.

6.2.1 Capabilities Implemented, Tested, and Results

The completion of the planned to be implemented capabilities in construction iteration 1 is list below:

Table 16: Conditions about the planned to be implemented capabilities in construction iteration 1

ID(CR-#)	Requirement Name	Description	Priority	Increment	Complete Condition
CR - 1	Internal query and display	The system shall allow HR Supervisors and HR staff the ability to query by position, date, category, degree, status and name.	M (Must have)	1	Done
CR - 2	Applicant attachments	The system shall give applicants the ability to attach a copy of driver's licenses, resumés, degrees, and board registrations	C (Could have)	1	Done
CR - 3	Attachment download	The system shall give HR Staff and hiring manager the ability to download attachments to any applicant's application	C (Could have)	1	Done
CR - 4	System Reports	The system shall give assistants the ability to generate reports from the data and export the reports into Microsoft Excel	S (Should have)	1	Done
CR - 5	EEOC Generation	The system shall generate EEOC forms to each position based on database information	M (Must have)	—	Removed from the requirement

CR - 6	Application/Position Status	The system shall allow hiring managers and only hiring managers to update the status of each applicant's application to a position	S (Should have)	1	Done (the requirement has been changed a little that HR staff is also allowed to change status)
CR - 7	Applicant/Employee Category	The system shall allow HR staff and only HR staff users to change the category of the applicant	S (Should have)	1	Done
CR - 8	Add a Job Post	The system shall allow HR staff users to add a new job post	M (Must have)	1	Done
CR - 9	Edit a Job Post	The system shall allow HR staff users to edit existing job posts	M (Must have)	1	Done
CR - 10	Remove an Old Post	The system shall allow HR staff users to remove old posts	M (Must have)	1	This requirement has been modified that now the old Posting is "inactivated" rather than "deleted"
CR - 11	One or more user applications	The system shall allow applicants to apply to one or more job posts at a time	S (Should have)	1	Done
CR - 12	Applicant/HR/IT Login	The system shall allow applicants, HR and IT to log into the system	M (Must have)	1	Done
CR - 13	Distinct Applicant /HR/IT Roles	The system shall visually and operationally distinguish between the applicant, HR, and IT roles	C (Could have)	1	Done
CR - 14	Applicant/HR/IT Logout	The system shall allow applicants, HR and IT to log out of the system	M (Must have)	1	Done
CR - 15	View applicant application	The system shall allow HR staff to view applications. The system shall allow HR managers to view applications which have "Qualified"	M (Must have)	1	Done
CR - 16	Download applicant application	The system shall allow HR staff and HR hiring managers to download an application. In other word, the application should be printable.	M (Must have)	2	Move to iteration 2
CR - 17	Search user profiles	The system shall allow HR staff to search for user	C (Could Have)	1	Done

		profile.			
CR - 18	Delete a user profile	The system shall allow IT staff to delete internal user profiles	S (Should have)	2	This requirement has been moved to construction iteration 2
CR - 19	Internal account creation	The system shall allow IT, HR staff, and HR managers to create accounts with IT, HR staff and role HR manager roles and privileges as appropriate depending on their role	S (Should have)	1	This capability requirement has been modified, now the IT, HR staff, and HR managers' account will only be assigned by IT staff
CR - 20	External account creation	The system shall allow applicants to create their own user account	M (Must have)	1	Done
CR - 21	Reset password	The system shall allow a user to recover or reset his password	C (Could have)	1	Done
CR - 22	Recover password	The system shall allow a user to recover his password	C (Could have)	1	Done
CR - 23	Unlock Account	The system shall allow IT to unlock locked accounts	S (Should have)	—	Removed
CR - 24	Request account unlock	The system shall allow a user to request that his account be unlocked	S (Should have)	—	Removed
CR - 25	Modify User Roles	The system shall allow IT and HR staff users to modify user roles	C (Could have)	2	Moved to iteration 2
CR - 26	Applicant Privileges	The system shall grant applicants the ability to apply online, add attachments and update the name, address, and contact information in their profile	S (Should have)	1	Done
CR - 27	View Account	The system shall grant applicants the ability to view their profile information	S (Should Have)	1	Done
CR - 28	User Profile Expiration	The system shall automatically cause user profiles to expire after a period of time which shall be configurable by the System Administrators	C (Could Have)	2	This capability requirement has been moved to construction iteration 2 to be developed
CR - 29	Prevent Single Person / Multiple User Accounts	The system shall restrict users from making multiple accounts by requiring a social security number to	C (Could have)	1	Currently we insist that one applicants can only have one

		create an account.			account, but we don't think it is a good idea to require a SSN in register. This capability requirement has been modified in CR-41
CR - 30	Hiring manager query restriction	Hiring manager query results shall be restricted to those candidates that are marked as "Qualified" or Employee	M (Must have)	1	Done
CR - 33	Input validation	The system shall validate user input on the client side and on the server side	C (Could have)	1	Client side: Done
CR - 39	Single Sign-On	The system shall allow LACGC users (HR, IT) to log in to the system using their windows login information when on the intranet and when on the internet	W (Want to have)	—	Removed
CR - 41	Prevent Single Person / Multiple User Accounts using email addresses	The system shall require an email address that is unique to the system when creating user accounts in order to restrict users from making multiple accounts	S (Should have)	1	Done

The test results of each capabilities list below:

Table 17: Conditions about the planned to be tested capabilities in construction iteration 1

ID(CR-#)	Requirement Name	Test Result	If fail, why?
CR - 1	Internal query and display	Fail in TC-01-09	Cannot query by degree
		Fail in TC-01-12	Cannot query by degree
		Fail in TC-01-13	Hiring managers should not be able to view unqualified applications
CR - 2	Applicant attachments	Pass	
CR - 3	Attachment download	Pass	
CR - 4	System Reports	Pass	
CR - 6	Application/Position Status	Pass	
CR - 7	Applicant/Employment Category	Pass	
CR - 8	Add a Job Post	Pass	
CR - 9	Edit a Job Post	Pass	
CR - 11	One or more user applications		
CR - 12	Applicant/HR/IT Login	Pass	

CR - 13	Distinct Applicant /HR /IT Roles	Fail in TC-01-13	Hiring managers should not be able to view unqualified applications
		Fail in TC-10-02	HR Staff should not be able to view unqualified applications
		Fail in TC-10-04	Hiring managers should not be able to view unqualified applications
CR - 14	Applicant/HR/IT Logout	Pass	
CR - 15	View applicant application	Fail in TC-10-02	HR Staff should not be able to view unqualified applications
CR - 17	Search user profiles	Fail in TC-10-04	Hiring managers should not be able to view unqualified applications
CR - 20	External account creation	Pass	
CR - 26	Applicant Privileges	Pass	
CR - 27	View Account	Pass	
CR - 30	Hiring manager query restriction	Fail in TC-01-13	Hiring managers should not be able to view unqualified applications

Table 18: Conditions about the planned to be implemented capabilities in construction iteration 2

ID(CR-#)	Requirement Name	Description	Priority	Increment	Complete Condition
CR - 13	Distinct Applicant /HR /IT Roles	The system shall visually and operationally distinguish between the applicant, HR, and IT roles	C (Could have)	2	Done
CR - 16	Download applicant application	The system shall allow HR staff and HR hiring managers to download an application	M (Must have)	2	Done
CR - 18	Delete a user profile	The system shall allow IT staff to delete internal user profiles	S (Should have)	2	Done
CR - 25	Modify User Roles	The system shall allow IT and HR staff users to modify user roles	C (Could have)	2	Done
CR - 28	User Profile Expiration	The system shall automatically cause user profiles to expire after a period of time which shall be configurable by the System Administrators	C (Could Have)	2	Done
CR - 31	Data Archival	The textual data in the system shall be capable of being archived using standard database archival methods.	C (Could have)	2	Done
CR - 32	Strong Passwords	The system shall require users to use strong passwords to create user accounts	W (Want to have)	—	Removed from the requirements
CR - 33	Input validation	The system shall validate user input on the client side and on the server side	C (Could have)	2	Done
CR - 34	Input Sanitization	The system shall validate all	C	2	Done

		user input, escape special characters on valid user input, and escape special characters in system output to prevent potential security breaches	(Could have)		
CR -35	Sensitive Information Database Storage	The system shall store passwords and any other sensitive authentication information in an encrypted format	C (Could have)	2	Done
CR -36	Sensitive Information Filesystem Storage	The system shall store uploaded files in an encrypted format	W (Want to have)	—	Removed from the requirements
CR -37	Sensitive Data Display	If a system error occurs, the system shall not display specific technical information to the user, such as Java stack traces, source code, variable values, etc., all of which would be considered security-sensitive information. Instead the system shall display a user-friendly error message	W (Want to have)	2	Done
CR -38	Automatic Account Lock	The system shall lock accounts after 4 unsuccessful attempts to log in	W (Want to have)	—	Removed from the requirements
CR - 40	Federated Search	The system shall provide the ability for HR Staff and IT users to add a row to the database so that the user id for an account of a newly hired employee will be related to the employee id in the HR database. In other words, there will be a table with at least two columns where each row would have an application system account id and the employee ID from the database. This will allow for federated queries across the two systems	W (Want to have)	—	Removed from the requirements

Table 19: Conditions about the planned to be tested capabilities in construction iteration 2

ID(CR-#)	Requirement Name	Test Result	If fail, why?
CR - 13	Distinct Applicant /HR /IT Roles	Pass	
CR - 16	Download applicant	Pass	

	application		
CR - 18	Delete a user profile	Pass	
CR - 25	Modify User Roles	Pass	
CR - 28	User Profile Expiration	N/A	
CR - 31	Data Archival	N/A	
CR - 33	Input validation	Fail in TC-04-02 Fail in TC-05-02 N/A in TC-11-05 N/A in TC-16-03	Should not be able to create a new job post with empty fields. The bug has been fixed by now.
CR - 34	Input Sanitization	N/A	
CR -35	Sensitive Information Database Storage	Pass	
CR -37	Sensitive Data Display	Pass	

6.2.2 Core Capability Drive-Through Results

In general, the clients showed satisfaction of the product. But they mentioned certain aspects that need changed or developed. And some change of the capability requirements.

The feedbacks from the clients list below:

Table 20: Core Capability Drive-Through Result

ID(CR-#)	Requirement Name	Feedbacks (positive ones, Improvements needed/suggested or Changes to-be considered)
CR - 1	Internal query and display	Clients think the function is exactly what they want.
CR - 2	Applicant attachments	<ul style="list-style-type: none"> • There should be requirements about what kind of attachments are needed. For the attachments that all the applicants should upload(application, resume and diploma), maybe we can specifically list and set a button such as "Upload Application". • The documents of .doc and .pdf are clients' favorites. • The red line of " You must fill in the information which is marked by * " should be deleted in the upload attachment page. • If the applicant doesn't upload the required attachment, he/she cannot proceed.
CR - 4	System Reports	Clients think the function is exactly what they want.
CR - 5	EEOC Generation	During CCD, the clients says that they will ask the applicants to fill out the EEOC form at site, which means this capability requirement has been removed.
CR - 8	Add a Job Post	When change the activity of multiple job postings, the "Activate and inactivate" button should be separated to 2 buttons.
CR - 9	Edit a Job Post	
CR - 11	One or more user applications	UI problems: <ul style="list-style-type: none"> • The job descriptions should be not editable so the applicants cannot change it by mistake or on purpose. • The text on the button should be "apply" instead of "continue" • The language ability should be a text box to allow the applicant to write their ability themselves. And the level of the language ability should be

		<p>listed as "Read(Beginner), Speak(intermediate) and Write(advanced), etc" or "Read, Write and Fluid".</p> <p>Because some applicants may have more than one kind of language abilities, so maybe this content should be designed into a text area so they can fill out all the abilities they have.</p> <ul style="list-style-type: none"> • The text on button "new education" should be changed to "add education". Same change should be applied to add new work experience button. • For the dropdown textbox, if an applicant chooses "Others", a textbox should pop out to allow the applicant to fill in the specific answer of the question. • If the user clicks on "Previous" or does other action to leave a page without saving the content he/she has filled in, there should be a confirmation to confirm that he/she is aware that the content will not be saved and they still want to proceed. • There should a space between 2 work experiences. • If the content is not allowed edit, don't use text area. • The word in confirmation of the agreement of the legal code should be changed from "agreement" to "requirement". And it should moved to be together with the last page with the applicant's signature. • We should improve the layout of the confirmation page of an application. <ul style="list-style-type: none"> — The table is not necessary — We can just list the name of education and work experiences' names and when click on these names, the content will expand. <p>To print the confirmation of the application, we can first "Print and View", then print so the layout will be kept.</p> <p>—"Part 1" and "Part 2" should be more specific.</p> <ul style="list-style-type: none"> • There are typos in the message of applying successfully. <ul style="list-style-type: none"> —"Successfully" rather than "Successful" —"submitted" rather than "saved"
CR - 12	Applicant/HR/I T Login	The "Signin" should be split up to "Sign in"
CR - 20	External account creation	<p>The UI problems:</p> <ul style="list-style-type: none"> • MI and second phone number should not be mandatory, so there should not be "*" after those 2 labels. • The alignment of the checkbox should be side by side rather than top-down - so the length of the page should be shortened a lot. • An error in the education levels: There should be AA,BA,BS and no PA • In "MILITARY EXPERIENCE" and "VERIFICATION OF EMPLOYMENT", if the applicant choose No (means there are nothing needed to write in the text area below), the text areas should be hide.

6.3 Adherence to Plan

6.3.1 Adherence to Plan in Construction Iteration 1

In construction iteration 1, we finished most of the planned capabilities, the results are showed below:

Table 21: Adherence to Plan in Construction Iteration 1

	Must Have	Should Have	Could Have	Want to Have
Plan	11	11	10	1
Result	8	7	6	0

And the reasons of the un finished capability requirements are:

1. The requirement has been modified during the development.

This kind of capability requirements are :

CR-10, CR-18, CR-19

These CRs has been completed according to the modified ones.

CR-16 and CR-25 need to complete in iteration 2

And CR - 29 is a duplication with CR-41.

Clients don't need CR-5, CR-23, CR-24, CR-39.

2. We still need learn and explore to accomplish the capability requirement

This kind of capability requirements are :

CR-28, CR-33

These CRs has been moved to iteration 2.

6.3.2 Adherence to Plan in Construction Iteration 2

In construction iteration 2, we finished most of the planned capabilities, the results are showed below:

Table 22: Adherence to Plan in Construction Iteration 2

	Must Have	Should Have	Could Have	Want to Have
Plan	1	1	7	5
Result	1	1	7	1

And the reasons of the un finished capability requirements are:

1. The requirement has been removed from the requirements during the development.

This kind of capability requirements are :

CR-32, CR-36, CR-38, CR-40