# Project Plan

VERSION 4.0

## Cognitive Contact

This document outlines the project plan and management strategy for the TheraTouch project of the Senior Design class Cognitive Contact.

**Texas Christian University**

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# Revision Sign-off

By signing the following, the team member asserts that he/she has read the entire document and has, to the best of his or her knowledge found the information contained herein to be accurate, relevant, and free of typographical error.

| NAME | SIGNATURE | DATE |
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# Revision History

| VERSION | DATE | CHANGES |
|---|---|---|
| **Version 1.0** | 10/5/2011 | Initial Draft |
| **Version 1.1** | 10/16/2011 | Changed indents to improve readability |
| **Version 1.2** | 10/30/2011 | Changed graphics and verbiage to reflect change in team and product names. Made changes based on Dr. Payne's review of document. |
| **Version 1.3** | 11/6/2011 | Changed graphics to maintain standard throughout docs. |
| **Version 1.4** | 12/13/11 | Final revisions for Iteration 1 |
| **Version 4.0** | 4/15/2012 | Final Version |

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# 1. Introduction

## 1.1 Purpose

The overall purpose behind this project is to serve as a capstone project for the Senior class in the Computer Science Department at Texas Christian University (TCU) for the 2011-2012 academic year. This project will not only gauge the efforts of the students involved, but will also prepare them to graduate and become contributing members of the computer science industry.

## 1.2 Proposal

The members of Cognitive Contact propose to develop a therapeutic activity system using a Microsoft Surface unit and a Windows 7 desktop. By working in conjunction with various staff members and stakeholders at Texas Health Resources (THR), Cognitive Contact will create a system which will allow physical therapy patients to participate in a variety of activities. This system will also allow participating clinicians to customize the therapy session and analyze the data collected during participation in each activity. The intent of the system is to have patient activities take place on the Microsoft Surface with clinician administration activities and data analysis/viewing to be done through a Windows 7 desktop application. Cognitive Contact shall begin with the existing framework and database structure from the Healing Touch software and Healing Vision application developed by the Senior Design class at TCU in 2010-2011.

# 2. Project Definition

## 2.1 Background

Cognitive Contact will work with the Healing Touch project from last year's Senior Design class. The group has been provided with a Microsoft Surface unit, three Windows 7 desktop PC's and a Windows Server platform. Cognitive Contact will be working in conjunction with Hands-On Therapy to develop a common framework and database structure. In 2009, the Glenrose Rehabilitation Hospital in Edmonton, Alberta, Canada, in conjunction with the Computer Science Department at the University of Alberta, tested the use of Surface technology to aid upper extremity motor rehabilitation. In 2010, the Harvard School of Engineering and Applied Sciences used Surface technology to develop a project aimed at rehabilitation of impaired upper extremity motor function in children with cerebral palsy. Both projects discovered that the use of Surface technology can make rehabilitation more exciting and can enhance the effectiveness of some of the standard table top therapies commonly used in neuromuscular and neurocognitive rehabilitation.

## 2.2 Objectives

The primary objective of this project is to allow the members of Cognitive Contact to demonstrate their understanding of the subject material covered throughout the duration of their studies at TCU. Cognitive Contact will do this by working in conjunction with THR to develop a rehabilitative therapy system to analyze and treat a variety of conditions. Cognitive Contact will work with Team Hands-On Therapy to design, develop and deploy the TheraTouch software package on a Microsoft Surface unit for the purpose of real world cognitive and occupational therapy.

## 2.3 Desired Outcomes

Upon completion of this project, Cognitive Contact shall achieve the following outcomes:

- Demonstrate the ability to work as a group while maintaining individual accountability
- Demonstrate a working knowledge of the software engineering process
- Provide a fully functioning Microsoft Surface unit to Jeanie Parsley for use at the Outpatient Rehabilitation Clinic at THR Harris Methodist HEB
- Completion of a comprehensive presentation showcasing the project
- Participation in the TCU Student Research Symposium
- Participation in the North Texas Area Student Conference

# 3. Organization Strategy

## 3.1 Team Structure

### 3.1.1 Roles and Responsibilities

- **Scott Boykin** – Framework Lead, Activity Development, Design

  Scott is the primary programmer for the Microsoft Surface. He helps coordinate inter-group communication while developing and enhancing the application framework. Scott also facilitates the creation of the design document.

- **Adam Burt** – Activity Development, Graphics, Design

  Adam created and maintains the Cognitive Contact team website. He also created the project name and project logo. Adam is heavily involved in programming on the Microsoft Surface. He helps with creation of the design document and graphics used in the application.

- **Cristina Cline** – Project Manager, Technical Supervisor, Activity Development, Testing

  Cristina is the project manager for Cognitive Contact. She is responsible for the overall group structure and managing the joint project components. Cristina is also an activity developer and is responsible for TheraTouch system testing.

- **Jeffrey Gettel** – TheraLink Lead, Database Lead

  Jeff is the lead on the development of TheraLink and is responsible for enhancing, updating and maintaining the database. He is also responsible for facilitating requirements gathering and the creation and maintenance of the requirements documentation.

- **Andrew Hughes** – Activity Development

  Andrew is responsible for contributing to the gathering of requirements and preparation of the requirements document. He is also an activity developer.

- **Joey Wilkinson** – Scheduling Lead, Website Manager, TheraLink Programmer

  Joey is responsible for maintaining and updating the project schedule, including creation of WARs and a Gantt chart. He is also tasked to assist with the development of TheraLink.

### 3.1.2 Member Bios

- **Scott Boykin –**

  Scott is a Computer Science Major. He plans on pursuing master's degree in Game Development. He is a member of the TCU Marching Band, and is Vice-President of Kappa Kappa Psi, a band service fraternity. In his spare time, he enjoys hanging out with his friends, playing video games, and watching movies.

- **Adam Burt –**

  Adam Burt is a Senior Computer Science Major. In his spare time, he enjoys painting, print making and spending time with his two daughters Alice and Maisie. He will be excited when his 3 year old can enjoy the pleasures of playing Halo and Gears of War with him someday.

- **Cristina Cline –**

  Cristina is a Computer Science major also pursuing a Bachelor of Arts degree in Math with specific interests in software engineering. She is a United States Army Veteran of OIF and has over 5 years of IT industry experience. Cristina plans on pursuing a career as a software engineer in support of the Department of Defense. Outside of academia, Cristina enjoys playing softball, dancing and spending time with her husband and son.

- **Jeffrey Gettel –**

  Jeff is currently a fifth year-senior CITE major with a minor in business. He was on the TCU swim team for 4 years, during which he won numerous Student-Athlete awards and honors. He also represented the swim team on the Student-Athlete Academic Committee (SAAC) and won the first ever Richard Sybesma Endowed Scholarship Award. He is a member of the Upsilon Pi Epsilon International Honor Society for the Computing and Information Disciplines. Since May, he has been working as a Web Producer at USFI Marketing Communications.

- **Andrew Hughes –**

  Andrew is a CITE major with a minor in business. He has been working since May as a Web Developer at Billmax Billing Solutions, a subdivision of the iSpark Group. Originally, he was born, and grew up, in Milwaukee, Wisconsin. In his downtime he likes to code his various personal projects, hang out with friends, and play video games.

- **Joey Wilkinson** –

  Joey is a Computer Information Technology major with a minor in Studio Art. He was born and raised in San Diego, CA and grew up playing lacrosse. While attending TCU, Joey worked as a private IT consultant for various clients, along with working at the TCU Technology Resources Computer Help Desk. Currently, Joey is working at Elbit Systems of America as a Software Engineer Intern. He plans to graduate this May and pursue his software engineering career.

## 3.2 Control Strategy

### 3.2.1 Meeting Structure

During the Fall Semester of 2011, Cognitive Contact meets every Tuesday morning at 8:00 AM in the Senior Design Lab (Room 330 of the Tucker Technology Center at TCU). During these meetings, we discuss the weekly status of each member and address any issues that have come up during the previous week. We also discuss the plans and assigned tasks for

each member during the following week. Cognitive Contact also meets every Tuesday and Thursday at 11:00 AM, which is the regularly scheduled class time.

During the Spring Semester of 2012, Cognitive Contact meets every Sunday afternoon at 4:00 PM in the Senior Design Lab (Room 330 of the Tucker Technology Center at TCU). We also continue to meet every Tuesday and Thursday during regularly scheduled class time.

### 3.2.2 Communication Strategy

The primary method of communication for Cognitive Contact is e-mail. Each team member has provided at least one working, current email address. Each email address has been added to one Google team to create a distribution list for more efficient communication between team members. Cognitive Contact created a Google Site to post messages, notes, documents, questions, etc. This is intended to serve as a means to maintain communication and collaboration outside of meeting and class times. Members of Cognitive Contact have all provided each other with working phone numbers as well. Each team member is responsible for contacting the project manager in the event of an impending absence or late arrival.

### 3.2.3 Monitoring and Revision Strategy

Each major task involved in this project has been assigned to a team member as the lead and each lead has been assigned a backup team member. This backup team member is responsible for maintaining a working knowledge of the activities and progress of the lead for that task. This structure not only supplements the risk management strategy but serves as a system of checks and balances. Each team member is responsible for their own individual tasks and schedule as well as those of other individuals working on the same aspects of the project. At certain points throughout the duration of the project (i.e. – completion of code for certain functionality, documentation completion, design decision/changes, etc.) the group will collectively review and analyze the project status for quality and completeness.

Each task is to be completed on time, based on the schedule included in this document, and in accordance with the requirements found in the requirements documentation. The weekly status reports will be used to gauge progress and estimate completion times. While it is the responsibility of the individual team member to ensure they are on task and report any delays or deviations to the group, the project manager will monitor the progress of each team member and will reassign tasks as necessary should it become clear that any team member is unable to complete tasks on schedule.

All group members are responsible for being aware of the requirements specific to their task, in addition to the requirements covered under the general scope of the project. Changes to the requirements will be discussed immediately and the appropriate course of action will be determined among everyone in the group. For the common project components (Surface framework, DB structure, etc.) each team representative must collaborate with their specific team as well as the representative from the other team. Any updates, enhancements or revisions must first be reviewed by all team members before being implemented.

# 4. Schedule

## 4.1 Milestones and Deliverables

- **Project Support Environment** September 27, 2011

  Initial setup of support and development software, server with user accounts, team website, version control S/W, repository structured, and Camtasia demo.

- **Project Proposal** September 27, 2011

  Abstract of the TheraTouch system.

- **Project Plan Document V1.0** October 6, 2011
- **Requirements Document V1.0** October 20, 2011
- **Design Document V1.0** November 8, 2011
- **Test Plan Document V1.0** December 13, 2011
- **User Manual V1.0 (Skeleton)** December 13, 2011
- **Developer Manual V1.0 (Skeleton)** December 13, 2011
- **Iteration #1** September 9, 2011 - December 13, 2011

  Basic Surface framework is operational with database connectivity, adding a user from web application, simple activity with data collection.

- **Documents Version 1.x Complete** December 13, 2011
- **Iteration #2** December 14, 2011 - January 24, 2011

  Demonstrate a well refined framework with a comprehensive web application excluding reporting functionality and the first set of client-approved activities operational

- **Documents Version 2.x Complete** January 24, 2012
- **Iteration #3** January 25 - February 14, 2012

  Demonstrate a finalized framework, second set of client approved activities operational, refined web application along with basic reporting features

- **Documents Version 3.x Complete** February 14, 2012

- **Iteration #4** February 15, 2012 - March 13, 2012

  Final client approved activities completed, web application completed with full reporting functionality.

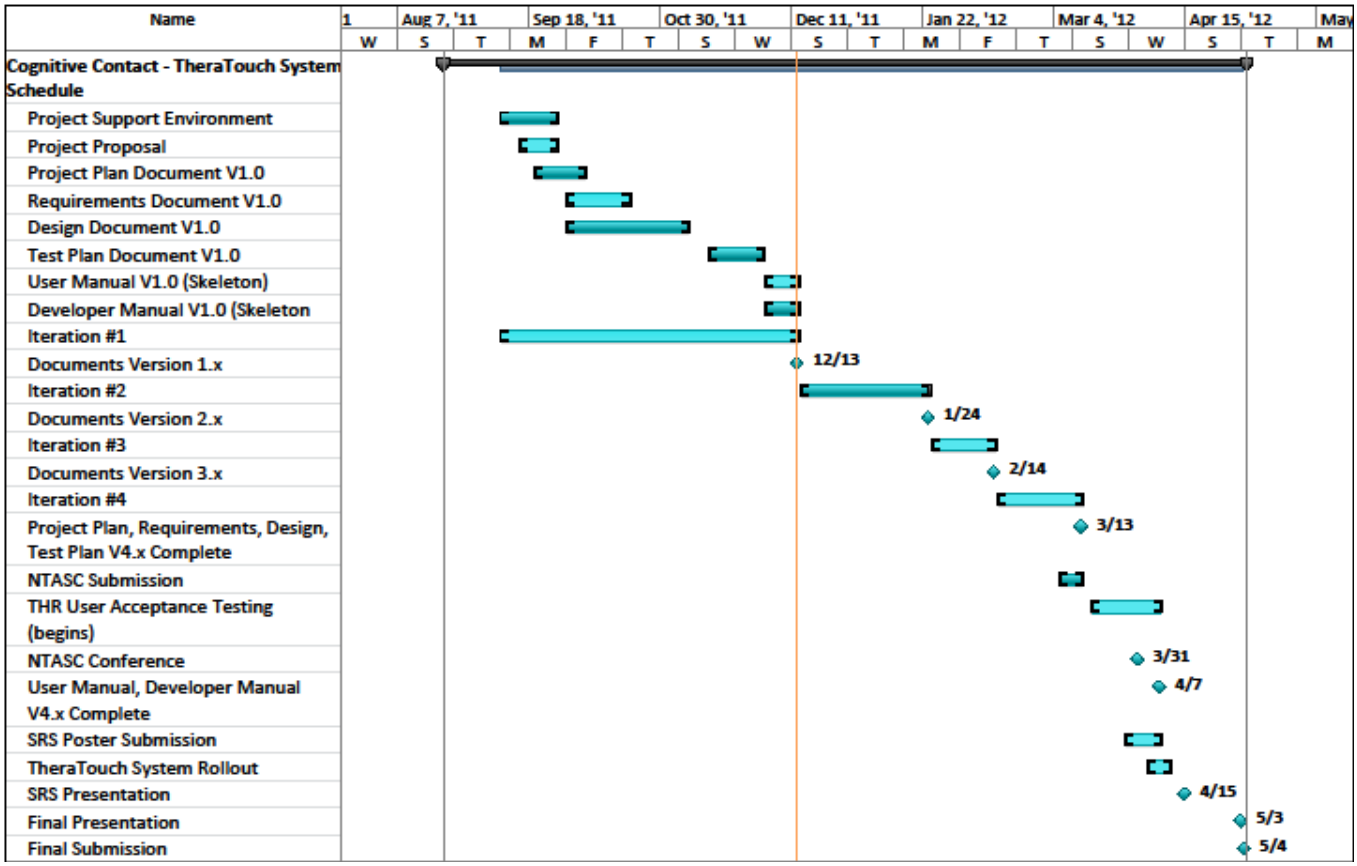
- **Project Plan, Requirements, Design, Test Plan V4.x Complete** March 13, 2012
- **NTASC Submission** March 13, 2012
- **THR User Acceptance Testing (begins)** March 16, 2012
- **NTASC Conference** March 31, 2012
- **SRS Poster Submission** April 10, 2012
- **TheraTouch System Rollout** April 17, 2012

  Delivery and setup the donated surface to THR client site, preloaded with the complete TheraTouch system.

- **SRS Presentation** April 20, 2012
- **User Manual, Developer Manual V4.x Complete** April 24, 2012
- **Final Presentation** May 3, 2012
- **Final Submission** May 4, 2012

  SVN cleaned up, website complete, all documents and project DVD submitted.

## 4.2 Gantt Chart



# 5. Risk Management

## 5.1 Risk Analysis

| ID | RISK | PROBABILITY | EFFECTS |
|---|---|---|---|
| 1 | Hardware/system failure in the Surface unit | Low | Catastrophic |
| 2 | Requirements change without notice to the extent of a major refactor | Low | Serious |
| 3 | Team members sick or absent at critical moments | Moderate | Serious |
| 4 | Requirements change, causing minor updates | High | Tolerable |
| 5 | Underestimation of code completion time | Low/Moderate | Tolerable |
| 6 | Consistent missing of deadlines by team members | Low | Serious |
| 7 | Server failure causing data loss | Low | Tolerable |

## 5.2 Risk Management Strategy

| ID | STRATEGY |
|---|---|
| 1 | Contact Microsoft to consult on resolution strategy. Testing can be done on PC using simulator. If necessary, can borrow resources from Hands-On Therapy until issue resolved |
| 2 | Inform client of effects such a drastic change. Design framework to more easily accommodate changes and identify solutions. Immediately meet as a team to collectively develop a plan of action. |
| 3 | Each team member has been assigned a backup responsible for keeping up with the task to easily take over if necessary. Team members are tasked with documenting progress and activities. |
| 4 | Design framework to more easily accommodate changes. Immediately address changes as a group and inform client of any changes to schedule. |
| 5 | Re-evaluate estimation techniques and adjust for next iteration. If necessary, increase modularity of coding tasks to streamline efforts. |

| ID | STRATEGY |
|---|---|
| 6 | Maintain weekly status reports. Re-allocate tasks as necessary. |
| 7 | Maintain working models of DB structure, including tables, stored procedures and queries to easily recreate DB if necessary. Data can be re-entered. |

# 6. Resources

## 6.1 Software

### 6.1.1 Desktop

**For TheraLink and general use:**

- Visual Studio 2010
- Adobe Creative Suite 5
- Core FTP LE
- Tortoise SVN
- Camtasia Studio 7
- Microsoft Office 2010
- Microsoft Project 2010
- Microsoft Visio 2010

**For Surface:**

- Visual Studio 2008
- Microsoft XNA Game Studio 3.0

### 6.1.2 Surface Simulator

**To be installed on desktop to simulate surface environment:**

- Microsoft Surface SDK 1.0 SP1 Workstation Edition
- Microsoft XNA Framework Redistributable 2.0
- Visual Studio 2008

### 6.1.3 Surface

- Microsoft Vista Service Pack 1
- Visual Studio 2008
- Tortoise SVN

### 6.1.4 Server/Database

- SQL Server 2008
- Windows Server 2008 R2

- Subversion
- Web server with IIS 7.0

**To be installed on desktop:**

- SQL Server Management Studio 2008 R2

## 6.2 Hardware

### 6.2.1 Desktop

- PC running Windows 7
- PC running Windows Server
- Server, PC and Surface connections to CSLab2

### 6.2.2 Surface

- Microsoft Surface Unit V 1.1 (Developer's configuration)

## 6.3 Healing Touch

### 6.3.1 Documentation

All documentation for the Healing Touch project from the Senior Design class of 2010-2011 can be found at brazos.cs.tcu.edu/1011/deliverable.html

### 6.3.2 Framework

The Healing Touch application will provide the foundation for the TheraTouch framework. All code can be found on the Brazos server using Tortoise SVN. The repository URL is svn://brazos.cs.tcu.edu/repository1011.

# 7. Glossary of Terms

**CITE** – Computer Information Technology

**Cognitive Contact** – The team name chosen for the 2011-2012 Senior Design Team X.

**COSC** – Computer Science

**DB** - Database

**Microsoft Surface** - A multi-touch tabletop computing device that uses gesture recognition to allow users interact with the machine

**NTASC** - North Texas Area Student Conference

**SDK** – Software Development Kit: A set of development tools for a specific software package

**Simulator** – In this context, a simulated Microsoft Surface environment used in conjunction with Visual Studio

**SRS** – Student Research Symposium: an annual Spring Semester event held by the TCU College of Science and Engineering.

**TCU** – Texas Christian University

**TheraLink** – The name of the clinician workstation application developed by Cognitive Contact

**TheraTouch** – The name of the Surface application developed by Cognitive Contact (also is used to refer to the overall system)

**THR** – Texas Health Resources