PROJECT PLAN

Version 4.0
April 21, 2011

Revision Sign-off

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

Name	Signature	Date
Michael Fore		
Sean Owen		
Anh Pham		
Jeffrey Regan		
Alex Welsh		
Matthew Williams		

Revision History

The following is a history of document revisions.

Version	Changes	Edited
Version 1.0	Initial draft.	**10/31/2010**
Version 1.1	Expanded responsibilities, revised scheduling, and changed edited introductory paragraphs.	**11/28/2010**
Version 2.0	Updated schedule and team roles, new cover page.	**1/30/2011**
Version 3.0	Updated iteration definitions. General fixes.	**2/28/2011**
Version 4.0	Final updates	**4/21/2011**

Contents

1. Introduction

1.1 Purpose

The purpose of this document is to outline the *Healing Touch* system as well as identify its structure, basic architecture, and development process. Furthermore, this document will define the scheduling and management approach used for the *Healing Touch* system.

1.2 Scope and Objectives

The primary objective of *Healing Touch* is to create a computerized system designed to provide therapeutic and rehabilitative exercises through gaming on multi-user, multi-touch devices. In addition, the system provides for the collection, storage, and retrieval of relevant game results in order to report patient outcomes for monitoring and comparative purposes. The system is being developed for Texas Health Resources (THR) using the Microsoft Surface and Apple iPad as the multi-touch gaming platforms.

Healing Touch will include: a uniform framework for both platforms that allow for the augmentation of games, a standalone application for clinician usage, and a database that accommodates the patient and game data.

1.3 Background

Technology has revolutionized the way the medical industry evaluates, diagnoses, and treats patients. For instance, the Human Rehabilitation Lab at MIT has developed robot arms which allow physical therapy patients to play a series of games as part of their rehabilitation process. Likewise, the Glenrose Rehabilitation Center in Alberta, Canada has recently added a touch screen table as a rehabilitation tool to their facilities. This table allows recovering patients, such as stroke victims, the ability to play simple games as part of the process to regain their motor skills. Similarly, *Healing Touch* will incorporate comparable technology to help rehabilitate a patient's condition. To accomplish this goal, *Healing Touch* utilizes the Microsoft Surface and the Apple iPad to not only rehabilitate the patients, but also supply THR clinicians with valuable data, so that these clinicians can provide improved treatment to future patients.

1.4 Organization

The organization of the remainder of this document is as follows:

Section 2 - Glossary: Informs the reader of any technical terms and/or abbreviations used throughout this document.

Section 3 - Overview: Explains how *Healing Touch* handles data flow and how the users will interact with the system.

Section 4 - Resource Specification: Identifies the tools and software that are available and required for the *Healing Touch* system.

Section 5 - Management Approach: Identifies the team members of the *Healing Touch* staff, their responsibilities, how the support environment was setup, and how scheduling and tracking was handled. Explains the organization of team meetings and how communication takes place among individual team members. Identifies how scheduling is maintained and how specification and feature control are analyzed.

Section 6 - Risk Analysis: Shows any contingencies that the members of *Healing Touch* may see. Identifies some mitigation strategies for each contingency and the probability/severity of each case.

2. Glossary

Apple iPad   The Apple iPad is a touch-interface tablet computer
                                    designed and distributed by Apple

Healing Touch Framework   The framework is the backend software that allows a user
                                    to login and choose a game. It also handles data collected
                                    from game plays and sends this data to the database.

Microsoft Surface   Microsoft Surface is a multi-touch product from Microsoft
                                    which is a combination of software and hardware
                                    technology that allows a user, or multiple users, to
                                    manipulate digital content by the use of gesture recognition

Motor Skill   A motor skill is a learned sequence of movements that
                                    combines to produce a smooth, efficient action in order to
                                    master a particular task

Project Support Environment   A Project Support Environment is a set of management and
                                    technical tools used to support software development

THR   Texas Health Resources

Healing Vision   Standalone application designed to access the *Healing
                                    Touch* database

3. Overview

The *Healing Touch* project is a system that provides rehabilitative exercises through gaming on multi-touch, multi-user platforms. Through this system, collection of relevant game data that pertains to patient outcomes can also be created and retrieved. The system consists of two primary modes: Testing and Free Play. In these two modes, the user will be able to access the framework, play games designed for rehabilitation, and exit the application.

3.1 System

The *Healing Touch* system is made up of the *Healing Touch* application running on the Microsoft Surface and Apple iPad multi-touch devices, the *Healing Vision* clinician application running on a Windows machine, and a remote database for patient and game information storage.

The *Healing Touch* application that runs on the multi-touch devices is comprised of a generic framework and several games. Each game is designed to focus on testing a specific skill such as memory, deductive reasoning, and neuromuscular. The framework has been developed to allow for the simple addition of new games in the future.

Healing Vision is an application intended for clinician use that provides the ability to add patients and clinicians to the system, print patient profiles, edit existing patient information, set game options, generate reports and queries, and export reports to Microsoft Excel.

All components communicate through the database which stores patient information, game data, and game options.

3.2 Modes

3.2.1 Testing

This is the primary mode for *Healing Touch*. In this mode, only a single user may play at one time and this user must be logged into the system in order to play. At the completion of each game, relevant data from each play will be sent to the database where it will later be analyzed by THR.

3.2.2 Free Play

In Free Play, a user may play any game using any options that they like without logging into the system. No data from this mode is sent to the database.

4. Resource Specification

4.1 Software

In order to ensure proper development and testing, the following software components are required:

- **General Support Environment**
  – Adobe Creative Suite 4/5
  – Apache Web Server
  – Apple iMovie 8.0.6
  – Camtasia Studio 7
  – Microsoft Office 2007 including Microsoft Project & Visio 2007
  – Subversion Server and Client
  – Windows (XP or better)

- **Surface Development**
  – Microsoft Surface SDK 1.0 SP1
  – Microsoft Visual Studio 2008
  – Microsoft XNA Framework Redistributable 2.0
  – XNA Game Studio 3.0

- **iPad Development**
  – Apple iOS SDK 4
  – Apple OS X 10.6.4 or later
  – Apple Xcode 3.2.2

- **Standalone Application/Database**
  – SQL Server 2008
  – Windows Server 2008 R2
  – Microsoft Visual Studio 2010

4.2 Hardware

In order to ensure proper development and testing, the following hardware components are required:

- A hardware configuration compatible with Apple (OS X or better)
- A hardware configuration compatible with Windows (XP or better)
- Apple iPad
- Microsoft Surface

4.3 Constraints

Time: *Healing Touch* is limited to the academic year ending on May 7, 2011

Hardware Capability: The Microsoft Surface and Apple iPad may not be up to THR's performance standards.

5. Management Approach

5.1 Startup

5.1.1 Acquisition and Setup

The Project Support Environment consists of Subversion, Apache Web Server, Microsoft Office 2007, Adobe Creative Suite 4/5, Microsoft Visio 2007, Microsoft Visual Studio 2008, Microsoft Visual Studio 2010, Camtasia Studio 7 and iMovie. Three Microsoft Surfaces were acquired: Radio Shack donated two Surfaces to the department and THR lent us one for development of *Healing Touch*. The iPads were bought by the TCU Computer Science Department.

5.1.2 Staff

Listed below are the senior students at Texas Christian University working on *Healing Touch*:

Michael Fore is a Computer Information Technology major.
Jeffrey Newton is a Computer Science major.
Sean Owen is a Computer Science major.
Anh Pham is a Computer Science and Mathematics major.
Jeffrey Regan is a Computer Science major.
Alex Welsh is a Computer Science and Mathematics major.
Matthew Williams is a Computer Information Technology major.

In addition, the team sponsor is TCU Professor **Dr. Donnell Payne**.

5.2 Work Planning

5.2.1 Milestones and Deliverables

Project Support Environment
October 10th, 2010

Project Plan Document (Version 1.0)
October 31st, 2010

Requirements Document (Version 1.0)
November 16th, 2010

Design Document (Version 1.0)
November 30th, 2010

Iteration 0
December 17th, 2010

Test application developed on both the iPad and Surface platforms. These applications will test connectivity between each platform and the database. Iteration zero will also support the network setup in which the database and platforms will communicate on.

Iteration 1

January 18th, 2011

Complete initial application and database framework. This will specifically include: A 'Login' menu for the iPad/Surface as well as 'Login' and 'Add User' screens for the standalone application.

Iteration 2

February 15th, 2011

"Froggie Says" game completed (with game options) for both platforms with database connectivity. In addition, iteration two will support the add, edit, and set game options of *Healing Vision*.

Test Plan (Version 1.0)

February 28st, 2011

Iteration 3

March 22st, 2011

"Froggie Says," and "Touchdown!" completed with database connectivity and fully tested. "Air Hockey" complete and in testing. Test Plan completed with test cases written for all games. In addition, iteration three will support all functionality of *Healing Vision.*

NTASC Abstract

March 10th, 2011

User Manual (Version 1.0)

March 29th, 2011

Iteration 4

April 11th, 2011

Project completed with all four games ("Froggie Says," "Meteor Defense," "Touchdown!," and "Air Hockey") with database connectivity. At this time, all code written for the four games, the framework, and the standalone application will be complete.

Code Completion

April 27th, 2011

NTASC Presentation

April 9th, 2011

SRS Poster
April 12th, 2011

SRS
April 15th, 2011

Developer Guide
April 20th, 2011

Final Submission
April 25th, 2011

Final Presentation
April 29th, 2011

5.2.2 Roles and Responsibilities

While each aspect of *Healing Touch* will have a lead person, each team member will contribute to multiple aspects of the project. This contribution to multiple facets will come secondary to the team member's primary role. Also, to avoid stagnation in any area of the project, any request for help must be addressed immediately with the utmost urgency by any members able to assist.

A section lead is in charge of an individual aspect of the project. While every member of the team will have general knowledge of the entire project, a subject lead will have intricate knowledge of the facet they oversee and should be contacted with any questions about that facet.

Michael Fore: **Testing Lead**

Michael defines and documents the testing procedures to ensure that testing is comprehensive and is in accordance with the requirements specification. He is also key in developing the end user documentation.

Jeffrey Newton: **Documentation Lead**

Jeffrey is responsible for preparing and outlining each document and assigning specific portions to appropriate individuals for completion. Jeffrey also is a primary programmer for the Microsoft Surface.

Sean Owen: **Project Manager**

Sean coordinates project aspects with outside parties. Sean is also a supporting role in the documentation, programming, design, and testing phases of the project.

Anh Pham: **iPad Lead**

Anh coordinates the design and development on the Apple iPad and is the sole programmer for this platform.

Jeffrey Regan: **Standalone Application/Database Lead**

Jeff is responsible for the database construction and integrity as well as the development of the standalone application, *Healing Vision*.

Alex Welsh: **Surface/Design Lead**

Alex coordinates the design and development on the Microsoft Surface and will be a primary programmer on this platform.

Matthew Williams: **Website/Graphics Lead**

Matthew develops and maintains the website, these tasks include: creating and posting weekly activity reports (WARs), maintaining project

schedule, deliverables, resources, and posting media. Matthew also develops all the graphics for the games.

5.3 Control

5.3.1 Meetings and Communication

Meetings occur weekly on Sundays. During each meeting, members report what they have accomplished since the previous meeting. Jobs to be completed in the upcoming week are assigned and it is verified that the whole group understands the current system status and the closeness of any impending deadlines.

WARs are collected at the end of meetings and posted to the website. Using WARs, the team members and team sponsor are able to monitor individual and collective progress throughout the semesters.

Each team member is responsible for communicating with the rest of the team, including outside of meetings. If a member is going to change an aspect of the system, such as the requirements or design, they will need to get approval from the client and sponsor, as well as, notify the rest of the team of the change.

5.3.2 Schedule Maintenance

Scheduled maintenance will be performed during weekly meetings. If a task is taking longer than expected, resources will be reallocated to correct the deficit. The updated schedule will be maintained in a Gantt chart in Microsoft Project.

5.3.3 Requirements Control

To ensure *Healing Touch* fulfills all requirements, software developers must reference the requirements document as work progresses. As a validation measure, full system testing will be performed at every iteration (see section 5.2.1 for iteration details) based on the Testing Lead's specifications. Any changes that are required must be discussed and agreed upon by the team and approved by the client and project sponsor.

5.3.4 Feature Control

Features will be implemented per client request, design specifications, and time allotted. Changes to features must be approved by the client and project sponsor. Feature verification will be performed after each iteration through system testing.

6. Risk Analysis

Contingency	Probability/Severity	Mitigation Strategy
Hardware unavailability	Moderate/Serious	Minimize the time needed on the hardware by doing as much testing on the emulator as possible
Changes to requirements which require immediate design rework are proposed	Low/Serious	Maximize information hiding in the design and derive traceability information to assess requirements that change impact.
Key staff is ill at critical times	Moderate/Moderate	Organize the team so that there is more overlap of work and people therefore understand each other's operations.
Server failure	Low/Serious	Make frequent backups of server data.
Performance issues	Moderate/Serious	Optimize project design and lower graphical intensity

Appendix A. Gantt Chart

ID		Task Name	Finish	
1		Project Support Environment	Sun 10/10/10	
2		Project Plan Document	Sun 10/31/10	
3		Requirement Document	Tue 11/16/10	
4		DesignDocument	Tue 11/30/10	
5		Project Iteration 0	Fri 12/17/10	
6		Project Iteration 1	Tue 1/18/11	
7		User Manual	Tue 3/29/11	
8		Test Plan	Mon 2/21/11	
9		Project Iteration 2	Tue 2/15/11	
10		Project Iteration 3	Wed 3/23/11	
11		Project Iteration 4	Mon 4/11/11	
12		Code Completion	Wed 4/27/11	
13		SRS Poster	Tue 4/12/11	
14		SRS	Fri 4/15/11	
15		Developer Guide	Wed 4/20/11	
16		Final Submission	Wed 5/4/11	
17		NTASC Abstract	Thu 3/10/11	
18		NTASC presentation	Sat 4/9/11	
19		Final Presentation	Fri 4/29/11	

Project: GanttChart
Date: Tue 4/26/11

Task		Summary		External Milestone	
Split		Project Summary		Progress	
Milestone		External Tasks		Deadline	

Page 1