Requirements Document

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Abstract

C7FIT is a mobile application for iPhone developed as a senior software engineering project under the supervision of eBay Inc. This app is essentially a health and fitness application that will be utilized by members of Club Seven Fitness in Portland. Currently Club Seven gym clients have difficulty tracking their workouts, goals, and schedules in the digital world. C7FIT aims to integrate existing technologies from Club Sevens services (MindBody API) as well as various iOS frameworks to provide users an accessible interface for interacting with their health and fitness goals on a mobile platform. The following document exercises the requirements of this project and formulates the plan of approach in developing this application in the next coming months. Such areas focused on include the project purpose, scope, perspective, interfaces, functions, constraints, and attributes. This document will additionally have elements of the higher level overview of the projects technical components.

Contents

1 Introduction

1.1 Purpose

The purpose of this document is to deliver a clear specification of the requirements for the C7FIT app. The document will define a clear objective for the development of C7FIT including software features, product interfaces, design constraints, product functions, user characteristics, assumptions, and dependencies.

1.2 Scope

C7FIT is an iOS mobile application designed for Club Seven Fitness in Portland. The app allows for gym members to engage with Club Sevens content on the mobile platform. Because Club Seven already utilizes MindBody for managing workout schedules and classes, our application can leveraging the existing user platform and bring interaction between users and Club Seven through the mobile platform with MindBodys APIs. In addition to interacting with the data from MindBody, our app will utilize iOSs HealthKit, which brings a plethora of user health data. Such application includes displaying the users daily level of activity. Furthermore, an activity tracking feature will allow for users to record running workouts and store such data locally. Finally, this software will extend to incorporate features from the traditional fitness scope including timers/stopwatches, contacting the local gym (Club Seven) through an embedded email service, daily workouts and video tutorials, and health statistics and records (eg. mile time, max bench press). The above is a listing of the essential features required for base viability. Additional features may be incorporated in future development. Stretch goals will be evaluated as development progresses.

1.3 Definitions

Term	Definition
User	An individual who interacts with the mobile application
C7FIT	Our iOS app
MindBody	Health/Wellness Service
Club Seven Fitness	Our client's client, a gym business based in Portland
HealthKit	iOS Health Framework
MapKit	iOS Map Framework
EventKit	iOS Calendar Framework
API	Interface to a piece of software exposed to the developer

1.4 Overview

The following document includes two main sections. The first section illustrates an overall description of the product. Additionally, this part will delve into user characteristics and constraints.

The second half of this document goes into the specific requirements of the products including external interface requirements, functional requirements, performance requirements, logical database requirements, and system attributes. Appendices at the end will provide structure for the results and release plans.

2 Overall Description

This section will provide an overview of the application and how it interacts with its related components. This section will also detail the general functionality and how the it will be used by customers. Finally it will discuss the constraints and assumptions in the design of the application.

2.1 Product Perspective

The product will consist of the mobile iOS application for Club Seven. The application will be used to interact with the MindBody API, the eBay store, and draw data from the native iOS frameworks: HealthKit, MapKit, and EventKit.

2.1.1 System Interfaces

The system will be contained and limited to iPhone, running iOS 9 and 10, as the product is purely an iOS application. The MindBody API will provide the users external account data. It will provide the daily available classes and allow them to sign up for personal training, sports training, or more general classes. The application will integrate these features with the phone by syncing up any scheduled classes with the phones calendar using EventKit. The application will also provide location information using MapKit, so the user knows their relative distance from classes and trainers.

The application will also use the MapKit and HealthKit independently of the MindBody API. HealthKit will be used to track the users general fitness levels, such as: steps per day, sleep, calories burned, etc. MapKit will be used to chart the GPS location of the user during their exercise activities.

As a stretch goal, the eBay API will be included as a way to monetize the application. Users will be able to see and purchase relevant products.

2.1.2 User Interfaces

The application will consist of 5 main topical screens: Home, Personal Trainer, Classes, Activity, and More(profile). Each screen will maintain a consistent layout shown in the wireframes drawn up in our second meeting. In general, the screens will have a navigation bar along the bottom of the screen divided up into the 5 topical screens. The top of the home screen will have a title bar, currently C7FIT, and a Sign In button. Certain screens that require information from the MindBody API will show different information depending on whether the user is signed in or not. More specifically, each screen will have table rows that either contain information or bring the user to other more specific parts of the app. Once the rows have been tapped, the user will be directed to a new screen and have the option to go back with a ¡ button on the top bar.

2.1.3 Hardware Interfaces

An iPhone capable of running iOS 9 and 10, the iOS versions were targeting, will be required to use this application. In addition, the phone will need to have the available memory space to download the app.

2.1.4 Software Interfaces

The MindBody API and eBay API will require developer accounts and accounts in order to function in our application. Their purpose has been discussed above: the MindBody API is key to the health

function of the application, and the eBay API will be used for monetization. Documentation for the MindBody API is available at https://developers.MindBodyonline.com/Documentation/GettingStarted. The documentation for the eBay API will need to be provided by the client, it hasnt been discussed yet as it is currently a stretch goal. The application will be primarily in portrait mode.

2.1.5 Communication Interfaces

Wifi and cellular data will provide internet access to get the data from the MindBody API.

2.1.6 Memory Constraints

The specific memory constraints of the application will depend on the device running the app. We are currently targeting a multitude of devices, iPhones (4s, 5, 6, 7) so the specific constraints will vary depending on the RAM and space available to each of these devices. However, the application will need to store some data locally like the activity map and personal statistics.

2.2 Design Constraints

2.2.1 Operations

The user will be required to sign in to MindBody to access the full capabilities of this application.

2.2.2 Site Adaption Requirements

The User Interface of this application will be in English. We will not provide other languages (as of initial release). The application will fit and work on current iPhones running iOS 9 or 10: including iPhone 4S to 7 and sizes 4,5,6, and 6 plus.

2.3 Product Functions

This mobile application will be a personalized app that connects the functionality of the MindBody API to the C7FIT gyms customers. The functionality again can be split up into the 5 main portions Home, Personal Trainer, Classes, Activity, and More, with Home having the most varied functionality. Home will be the starting point for the user and provide general overview on their daily options. It will display their schedule - if theyre signed up for classes on that day, a daily workout video from YouTube, and a daily motivational quote. The Personal Trainer screen will provide the user with options to sign up for personal and sports training. The Class screen will be similar to the personal trainer screen except the user must select a date and view the available classes, as classes are already scheduled. The Activity screen will display the users current daily activity, and their PR in various fitness tests. Additionally, this screen will have stopwatches and maps to assist their workouts. Finally, the More screen will contain their profile and personal information in addition to a personal ask trainer option.

2.4 User Characteristics

The target audience for the product are the members of C7FIT gym. These gym members will only be able to access the services that are provided by the gym. They wont be able to create classes or add trainers. This functionality is outside the scope of this application and will be left up to the MindBody API.

2.5 Constraints, Assumptions, and Dependencies

This application depends on having a MindBody account for the majority of the data. Additionally, it requires the user have internet connection as most of the data is pulled through external APIs. The key aspects of the application is constrained by the limitation of this API.

Caching of the MindBody data will not be supported, and as such the application will not display information when the user does not have access to the API be it through internet or lack of account. The daily videos and motivational quotes do not come from MindBody and will cycle through a static set of quotes or video links.

We assume that the mobile device has the capability to run our application at an acceptable level. If the phone does not have enough resources, then the application may fail to run as intended or at all.

The application is dependent on the MindBody API, native HealthKit and MapKit, for most of its functions.

3 Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

C7FIT is a user-facing application, so naturally most of the design emphasis will be on the user interface and presenting information from external sources (such as Mindbody API, ebay API, GPS, etc) in a pleasing and easily digestible manner on the user interface. The main objective of the user interface is to help the user accomplish their most common tasks in as little time and effort as possible. Secondary goals are to represent Club Seven Fitnesss brand, while not being distracting, and to make tasteful use of animations to keep the user engaged, especially during operations that may require some time to complete such as API calls. (Designers often refer to these animations as microinteractions.)

Apples UIKit API provides minimally styled basic design elements, such as buttons, labels, sliders, text fields, and more. We intend to use these as the building blocks for our application wherever possible. In the MVP phase, unless a special element is absolutely necessary, we will just use the basic elements given to us by UIKit in their standard form.

Following completion of the MVP, we intend to add styling and animations to the most used elements, keeping minimalism, consistency, and reusability as a goal. Near the beginning of the project, we will design each screen using Sketch (a vector design program ideally suited for UIs). We will then implement this design down to the pixel in our app after the MVP stage.

The UI will have five tabs: Home, Personal Trainer, Classes, Activity, and More. The tabs will be displayed using UIKits UITabBar, and each underlying view will be managed by a single UITabBarViewController. Each tab is explained below:

1. Home Tab
2. Home will be a tableview with five cells. Some of these will be tappable, allowing users to view more detail than the snippet shown in the cell:

3. Todays schedule: This is a tappable cell that will show if the user is registered for a class today. If the user is registered, for a class today, it will be shown, if not, it will display the message No classes today, perhaps with the option of registering. If the user is not signed in, this will show a list of all the classes occurring today. The expanded view will display a scrollable list of available classes, with classes the user has registered for being highlighted.
4. Todays workout video
5. This will display a Youtube video
6. The video URL will be retrieved from a static file in a GitHub repo
7. The video will be different every day
8. Selecting the video will open it in a landscape, full-screen view
9. Todays Motivation
10. This is a simple cell that just contains a motivational phrase
11. The phrase will be fetched from a static file in a Github repo
12. Trainers
13. This button will be empty, leading to another view
14. The trainers view will be a tableview of personal trainers at the gym
15. Each cell will contain a trainers picture, name, and bio, likely cutting off the bio at a certain length with the option of expanding
16. Store (Stretch goal)
17. This cell will be added later if all other required features have been implemented
18. The store will use the eBay API to list products sold by C7Fit
19. Each item will be displayed in a cell in a tableview
20. Tapping a cell will show more information about the item, with the option to purchase it on eBay
21. Personal Trainer Tab
22. This screen will be divided into two sections
23. The top section will be titled Personal Training.
24. The top section will have a list of personal training classes from the MindBody api.
25. The bottom section will be titled Sports Training.
26. The bottom section will have a list of sports training classes from the MindBody api.
27. Each class shall be tappable.
28. Tapping on a class shall launch a new screen.
29. The new screen will be titled Personal Training (2) and a left caret.
30. Tapping on the left caret shall navigate back to the Personal Trainer main screen.

31. The personal training 2 shall have content about the selected class.
32. The class information displayed shall be Location, Training Title, and a section to pick a trainer.
33. The pick a trainer section shall be a list of trainers from the MindBody api.
34. Each trainer in the list shall have a picture, name and right caret indicating there is more information.
35. Pick a trainer screen shall have a title Pick Trainer and a right caret.
36. The pick trainer screen shall have a section about the trainer including Picture, Name, and Bio.
37. The pick trainer screen shall have a button to view availability which will navigate to a new availability screen.
38. The availability screen shall have a title Availability and a right caret.
39. The availability screen shall have a section that indicates the training title and trainer name.
40. The availability screen shall have a calendar that allows you to pick a day.
41. Once a day is selected the availability screen shall show a list of times.
42. The times for each day shall be provided by the MindBody api.
43. If a time is selected the user shall navigate to the booking screen.
44. The booking screen shall have a title Book and a right caret.
45. The booking screen shall list Training Title, Trainer, Date, and Time.
46. The booking screen shall have a button to Book.
47. The book button shall take the user to a booking modal.
48. The booking modal shall have a Confirm, Cancel, and Add to Calendar option.
49. The booking modal Confirm shall book the class for the user through the MindBody api.
50. The Cancel button shall close the modal and return the user to the previous booking screen.
51. The add to calendar shall use the iOS calendar SDK to add the event to the users phone calendar.
52. Classes Tab
53. The classes screen shall have two sections.
54. The top section shall be a calendar picker.
55. The calendar picker shall allow the user to select a single day.
56. The bottom section shall be a list of classes form the MindBody api.
57. The bottom section shall have a title Classes.
58. Each class in the list shall indicate class name and time.

59. Each class shall have a button to book the class.
60. When a user selects the book button a modal dialog shall appear.
61. The modal dialog shall have a title Book.
62. The modal dialog shall have a button to confirm.
63. If the user confirms the class will be booked for that user.
64. If the user confirms and the add to calendar is selected the event will be added to the calendar on the user device using the calendar sdk.
65. The modal dialog shall have a cancel button.
66. If the user taps the cancel button the modal dialog will close.
67. Activity Tab
68. The activity tab screen will be a collection of tools, user activity, and health results.
69. Todays Activity
70. The top section of the Activity Tab shall have a title Today Activity.
71. The content in the today activity section will include steps and active time from the Health Kit SDK.
72. If the user does not have a profile on Health Kit SDK then a message will be displayed to the user . To get activity go to health app on your phone
73. Workout Tools
74. The section session shall have a title Workout Tools
75. There will be three tools in this section.
76. The first tool will be stop watch.
77. The stopwatch cell shall have text saying Stop Watch and shall have a right caret.
78. If the user taps the stopwatch cell a new screen shall be started.
79. The stopwatch screen shall have a title Stop Watch and a left caret.
80. If the left caret is selected the user will be returned to the activity tab.
81. The stopwatch screen shall have a timer.
82. The stopwatch screen shall have a Start button that starts the timer.
83. The stopwatch screen shall have a Stop button that stops the timer.
84. The time shall remain on the screen until the user taps the start button again.
85. The second tool will be countdown time.
86. The countdown cell shall have text saying Countdown Timer and shall have a right caret.
87. If the user taps the countdown cell a new screen shall be started.

88. The countdown screen shall have a title Countdown Timer and a left caret.
89. If the left caret is selected the user will be returned to the activity tab.
90. The countdown screen shall have a timer.
91. The countdown screen shall have an option to select a timer duration.
92. The countdown screen shall have a Start button that starts the timer.
93. The countdown screen shall have a Stop button that stops the timer.
94. The time shall remain on the screen until the user taps the start button again.
95. Map
96. The map screen shall have a title saying Map and a right caret.
97. The map shall use the Mapkit SDK.
98. The map shall show map with current location.
99. The map shall a Start Activity - have a start activity option.
100. The map shall a Track Activity - track activity to record the track and draw it on the map.
101. The map shall a Finish Activity - stop the activity.
102. The map shall a Activity Details - Time and Distance for activity.
103. The map shall a Save Activity - Save locally on device in core data with time as title.
104. The map shall a View an Activity - Stretch goal to remap an activity.
105. Test Results
106. The test results section shall list all current recorded results.
107. The test results section will have an edit option.
108. The edit option will launch a new screen that list the test results and allows the user to enter the correct data.
109. Test results will include: Mile Time, Number of Push Up in a Minute, Number of Situps in a Minute, Leg Press, Bench Press, Lat Pull.
110. More Tab
111. The more tab shall display the signed in users profile.
112. The elements that will be displayed include picture, name, and current info from the MindBody api.
113. The more tab shall have a section to ask a trainer a question.
114. There will be the ability to select a trainer from the trainer list in MindBody api.
115. There will be a button to Ask the trainer.
116. When the user selects the Ask button a new email will be opened using the device email SDK.
117. The TO: field will be populated with the C7Fit email.
118. The Subject field will be populated with the Trainer name and Question.
119. The User will be able to enter content into the body.

3.1.2 Hardware Interfaces

C7FIT is an iOS 9 application, meaning it will run on any Apple iOS device capable of running iOS 9, 10, or the next approximately 5 iOS operating systems produced in the future. We will ensure to not use any deprecated APIs, and since Apple usually does not deprecate APIs without several years advance notice, we can expect C7FIT to be compatible with future Apple devices for at least the next three years.

The app will be specifically designed with the iPhone 5s and up in mind, but will be compatible with all iPhones down to the iPhone 4s. We intend to use an adaptive design to stretch to make maximum use of the variety of displays on these devices.

3.1.3 Software Interfaces

The primary software the app will interface with is the iOS operating system, as well as the UI framework provided by iOS called UIKit, and a large collection of helper libraries contained in Apples Foundation framework. These libraries provide for everything from app instantiation to making network calls, to saving to disk, to drawing UI elements such as buttons and sliders.

We may also elect to bring in a few external 3rd party libraries to use instead of the Foundation / UIKit framework in areas that Apples API is known to be a little rough. We intend to minimize the use of third party frameworks / libraries as little as possible however. We will only use the leader in that field to reduce the likelihood of it being deprecated, and will wrap it in our own API to enable easy swapping of underlying APIs and prevent building dependencies in our code on potentially fickle open-source projects.

3.1.4 Communication Interfaces

C7FIT will make extensive use of Internet REST APIs, especially the Mindbody API to provide functionality to the user. It will also make use of the eBay API if we meet our stretch goals to allow users to buy gym equipment online. Additionally, to backup user data and share preferences between devices, we may use Apples iCloud storage (this is another stretch goal). This saving of user data on Apples iCloud servers is largely abstracted and doesnt involve making traditional HTTP API calls. Finally, the app will make use of the iPhones GPS unit to communicate with satellites and determine the users precise location during a workout. Luckily, this functionality is largely abstracted by the iOS Location API, and just involves a few lines of code.

The most challenging external communications will be those with the MindBody and eBay API, as we will have to build a communication library with them based on their JSON REST APIs.

3.2 Classes and Objects/Functional Requirements

The main objective behind our program design is to reduce state to as few places as necessary. We plan on implementing our architecture with the principles of functional reactive programming in mind, so that developers can focus on building functionality of the app instead of worrying about bugs in their data flow.

3.2.1 DataStore

We will use the single-source-of-truth principle, along with dependency injection to reduce confusion about where data is coming from. All of the applications state will be kept in a central DataStore. This will have fields containing data structures capable of holding all the data needed for all the apps views, organized hierarchically roughly around the purpose / source of the data. The DataStore will be initialized upon app instantiation and a reference to it will be dependency-injected into each View Controller. This way, every View Controller will share the same source of truth, ensuring consistency between views. This will also ease caching and local storage.

Information will be requested from the DataStore using functions exposed by the stores interface. Upon fetching the data through whatever means necessary (network call or GPS call, retrieval from disk, etc) the view controller will be notified with the requested data, allowing it to update its UI. The View Controller will not perform any modifications to the data, besides what is necessary to display it nicely. No methods that modify the display of the information should require asynchronous operations. The method for notifying the ViewController of state changes will be discussed in the next section.

3.2.2 Responding to State Changes

There are several ways of responding to state changes, from callbacks to promises. We intend to use a functional reactive approach, in which the state of views is never explicitly changed, only described. Apple does not provide a functional reactive library, but there are two leading 3rd party libraries widely in use today: RxSwift and ReactiveCocoa. Both are similar, but ReactiveCocoa has deeper integration with Apples UIKit and Cocoa Touch frameworks. Receiving data from the API, the user changing screens, inputting text, pushing buttons, etc are state changes the app will respond to.

3.3 Performance Requirements

Modern iOS devices are relatively overpowered for this sort of application, so computational performance shouldnt be a worry. A much bigger priority than performant code should be readable code.

Places we should focus on performance are asynchronous calls, especially network calls. After the MVP, we should put priority on caching and prefetching data. If no cached data exists, we should display a useful animation that indicates progress.

3.4 Logical Database Requirements

A small amount of user preferences and cached data will be stored on-device. Apple provides a few APIs for this of varying simplicity and capability. We will probably use the simplest of these, NSUserDefaults for the MVP. NSUserDefaults is a simple key-value store for small pieces of data.

After we implement caching however, we will likely be motivated to use a more robust solution: either Apples CoreData or a third party solution such as Realm. Both provide a database-style interface, with CoreData providing a SQL style relational database-like interface, and Realm providing a more noSQL object-storage interface. Both use a custom query language with a Swift API.

3.5 Software System Attributes

3.5.1 Reliability

We will implement measures to ensure that the app functions well in all edge situations. Our programming methodologies described in the Classes and Objects section will ensure that developers are unable to compile the application without first accounting for all possible data states, including lack of GPS hardware, lack of network capability, disk failure, and more. Developers will be able to display helpful, user readable messages in all of these situations.

3.5.2 Availability

Most of the apps features will require internet access. However we dont intend to restrict access to the applications other features that dont require connectivity in the event that a network connection is lost. Features such as viewing user information, modifying on-device preferences, using the GPS or timer workout tracker, should still be functional. Additionally, the UI should display informative, but not disruptive information in disabled interface elements.

While we could cache network requests to the MindBody API while the device is offline, we will opt to just make the API attempt fail quickly and show an error to the user. Weve found that this helps prevent users from making unintentional actions to their account.

3.5.3 Security

The C7FIT app will contain some potentially sensitive health information, but not to the point where most users would want to add additional security measures such as TouchID or a passcode (common security measures on iOS). While users will be able to purchase appointments on the app, all payment information will be stored on MindBodys servers and will never be on-device. We will secure the payment process by authenticating the user with MindBodys API.

Purchasing from eBay will be done in the eBay app, which will handle all payment information and verification. C7FIT will just deep-link to the eBay app (or website if the app is not installed on the users device)

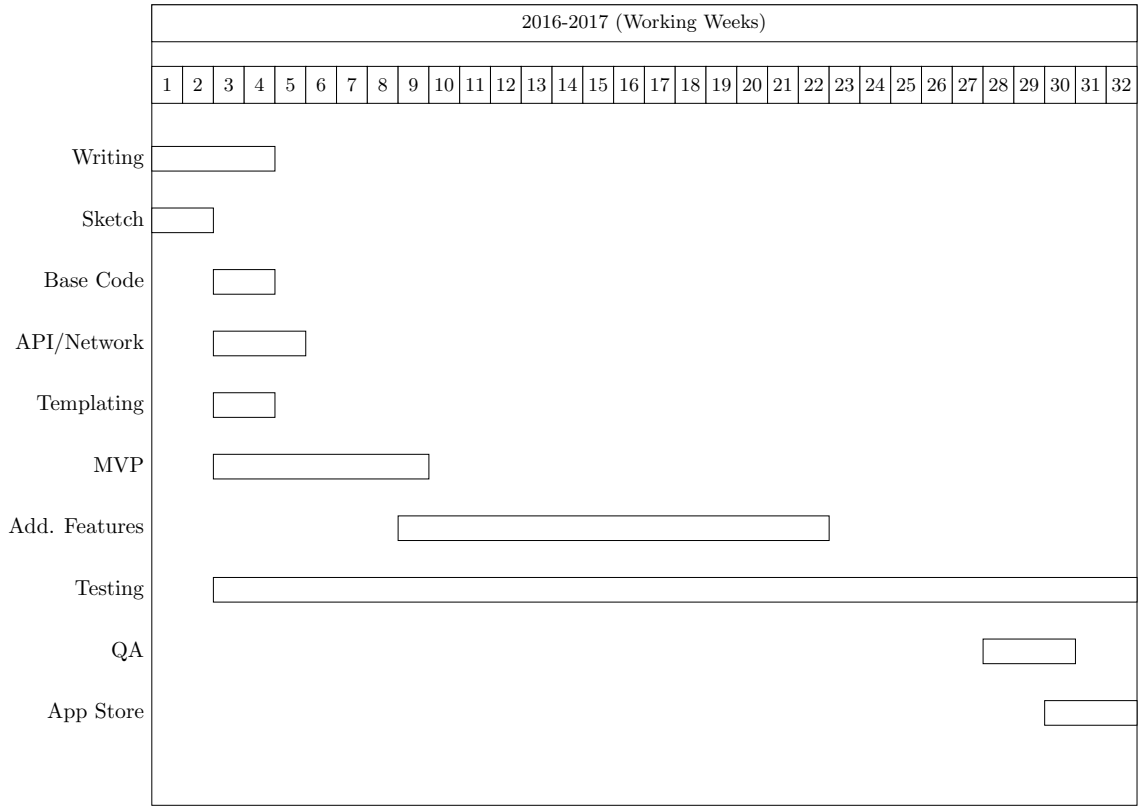
3.5.4 Maintainability

As the application will be used by Club Seven gym goers long after we complete development, there will need to be some form of maintenance in order to ensure C7FIT retains its quality and user base. In order to attain this, the app will be handed off to the eBay mobile team in Portland after publishing on the App Store. A small team of developers, whom we are currently working with will ensure the maintenance. Additionally, eBay Inc. will have the documentation we write this term for reference in the situation the app requires to be maintained long term.

3.5.5 Portability

The app is an iOS iPhone application. Because of the architecture of Apples development ecosystem, it should be relatively easy to port C7FIT to other Apple devices such as iPad. However for an Android application or any non-iOS device, there would be a substantial amount of more work to do before being able to publish. In terms of translation portability, we will be using NSLocalizableString to load localized strings from a centralized source of truth.

3.6 Gantt Chart



4 Signed Participants

Students
Brandon Lee
Rutger Farry
Michael Lee

Client

Luther Boorn

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