SkillCourt Backend

Andy Martinez & Matthew Santiago

Florida International University

Senior Project

## Legal Notices

## Abstract

There is a lot involved with the training of soccer players. The current system for training is primitive usually involving an instructor and a physical field for playing. The primary objective is to produce a new, modern, and system for training soccer players. The system will be a program with features that will assist players for learning the skills required on their own.

Implementing this system is revolutionary to the way avid players train in the sport. With the functionality and portability that SkillCourt offers, the user can create a personalized regimen for improving skills; thus, SkillCourt offers an overall improvement to both the soccer training and playing experience for players.

Table of Contents

[Legal Notices i](#_Toc410333582)

[Abstract ii](#_Toc410333583)

[Table of Contents iii](#_Toc410333584)

[1. Introduction 1](#_Toc410333585)

[1.1 Problem Definition 1](#_Toc410333586)

[1.2. Background 1](#_Toc410333587)

[1.3. Definitions, Acronyms, and Abbreviations 1](#_Toc410333588)

[1.4. Overview of Document 2](#_Toc410333589)

[2. Feasibility Study 2](#_Toc410333590)

[2.1. Description of the Current System 3](#_Toc410333591)

[2.2. Purpose of New System 3](#_Toc410333592)

[2.3. High Level Definition of User Requirements 3](#_Toc410333593)

[2.4. Alternative Solutions 4](#_Toc410333594)

[2.5. Recommendations 5](#_Toc410333595)

[3. Project Plan 5](#_Toc410333596)

[3.1. Project Organization 5](#_Toc410333597)

[3.2. Identification of Tasks, Milestones and Deliverables 8](#_Toc410333598)

[4. Appendix 9](#_Toc410333599)

[4.1. Appendix A - Project schedule 9](#_Toc410333600)

[4.2. Appendix B – Feasibility Matrix 9](#_Toc410333601)

[4.3. Appendix C – Cost Matrix 9](#_Toc410333602)

[4.4. Appendix D - Diary of Meetings 10](#_Toc410333603)

[5. References 13](#_Toc410333604)

## **Introduction**

### Problem Definition

As it stands, training for soccer can be a very cumbersome feat for the average person to endeavor unaided. Without proper guidance, progression dwindles and a person may not feel obliged to continue. With so few places to turn outside of professional help, a new method was needed to fill the void.

SkillCourt will be this new method for soccer coaching. Offering the cognitive skills and real-life routines one needs for soccer, SkillCourt can be an all-in-one self-trainer for anyone.

### Background

When it comes to sports, most people rely on actually playing for practice. Few go out of their way to receive proper training. Thus, there are very few platforms that offer a similar experience to what SkillCourt will offer. Most of our research for the system comes from our Product Owner who is also a soccer coach. Gummi’s knowledge on the subject has allowed him to create a vision for the system.

Using this knowledge, our aim for this project is to implement this vision with as many features as we can accommodate in the time given. This product will then be used as a base for the final SkillCourt implementation.

### Definitions, Acronyms, and Abbreviations

* **Pad Simulator**: A virtual device which will take the place of physical SkillCourt pads for testing showcasing purposes. This device offers all of the features a SkillCourt Pad will offer.
* **SkillCourt**: A system which uses SkillCourt Pads and a player interface for training soccer.
* **SkillCourt Arena**: A 20’x40’ room with SkillCourt Pads on the walls used for soccer training.
* **SkillCourt Pad**: A physical device with a flat surface that can measure and transmit when and how much pressure it received.

### 1.4. Overview of Document

Section two of the document is a feasibility study beginning with a description of the current system in section 2.1, moving onto the purpose of SkillCourt in section 2.2. After that, section 2.3 goes into a high level definition of the user requirements. Section 2.4 and section 2.5 contain alternative solutions to the requirements of our system and give recommendations to those systems respectively. In section three we will introduce the project plan. This is divided into the Project Organization in section 3.1 and Identification of tasks, milestones, and deliverables in section 3.2.

The final sections of the document are the appendices and the references. The appendix is divided into 4 parts. The first part is a schedule of the project which will break down the product’s creation into separate parts allowing for a progressive result. Appendix B and C contain a Feasibility and Cost Matrix respectively relaying what each part of the system will be and providing a cost of implementation. Lastly, Appendix B is a diary of the meetings we’ve had so far. Finally, section 5 lists references used for our project for research, planning, and coding.

## **Feasibility Study**

### 2.1. Description of the Current System

Currently, soccer training involves a lot of on-field practice, but offers no physical way to track progress. In fact, most sports do not offer a guided methodology for tracking progress or attempts to offer skill specific training. This lack of guidance and visuals for improvement creates an environment which makes it hard to progress without professional help.

### 2.2. Purpose of New System

As an attempt to overhaul this outdated method, SkillCourt will create an environment which will monitor players’ progress and offer an arena for furthering their capabilities as soccer players. By adding features such as personalized progress analysis and specialized skill training along with the ease of access and the portability that SkillCourt pads offer, SkillCourt will bring a whole new level of training for soccer, and possibly even more sports.

SkillCourt saves data from a player’s interaction with the system and analyzes it to present a visual representation of a player’s strengths, weaknesses, and progress throughout their training. These allow a player to be able to focus on what they need to offering the conditioning required to become an overall better player.

Along with customized user-defined training, SkillCourt will also feature cognitive skill training. SkillCourt’s specialized skill training will offer users access to routines designed to train specific skills for soccer. Along with the analyzed data, a player can choose skills they feel they need to improve upon. Ranging from Accuracy to Speed, a user will find a plethora of cognitive skills related to soccer being offered by SkillCourt.

### 2.3. High Level Definition of User Requirements

This project will consist of creating the back-end for SkillCourt, an activity which uses pressure sensitive pads to help create a measurement and a guide for soccer training. This includes developing an interface for accessing SkillCourt, creating programs that SkillCourt players will use for training, and parsing data from games to create visuals for player review. Also, since the pressure sensitive pads for SkillCourt are still in development, we will need to create a pad-simulator which will simulate the pads for testing and showcasing purposes.

The pad simulator is a virtual device which will take the place of SkillCourt pads for testing showcasing purposes. These pads will replicate the functionalities of the physical SkillCourt pads currently in development. The pad simulator will be able to connect to the SkillCourt user interface, be able to record data from incoming pressure, and send the data to the user device. Although not within the scope of our project, when the time comes, the pad simulator will be replaced by physical pads.

The programs created for SkillCourt training will offer users to develop skills and offer training needed for real life soccer situations. These programs will be developed using knowledge from the Product Owner who also has experience with coaching soccer. The programs will create the information required for player analysis and progression visuals for the user.

The user interface for SkillCourt will consist of an Android Application. This app will provide the user with access to a plethora of data and routines as well as offer access for the SkillCourt pressure pads. These SkillCourt pads provide no functionality without the user interface.

### 2.4. Alternative Solutions

#### 2.4.1. Description of Alternatives

#### 2.4.2. Selection Criteria

#### 2.4.3. Analysis of Alternatives

### 2.5. Recommendations

## **Project Plan**

As part of our project’s development process, we have created a detailed plan to organize our work throughout the semester. By following it, we will be able to keep track of both the project’s progress and our performance according to our requirements. This plan includes our individual roles, the personnel organization, and the hardware and software resources needed. It also includes a description of our tasks, milestones and deliverables.

### Project Organization

This section discusses the roles of all team members as well as the technologies that will be used to develop the SkillCourt system.

#### 3.1.1. Project Personnel Organization

This section lists the main role of each of the 2 team members working on the project.

Figure . Project Personnel Organization

#### 3.1.2. Hardware and Software Resources

This section describes the hardware and software resources that will be used during this project

Figure . Description of Hardware and Software requirements

### Identification of Tasks, Milestones and Deliverables

Table . Description of tasks, milestones, and deliverables

|  |  |
| --- | --- |
| Tasks | Task Dependencies |
| 1. Collect User Stories |  |
| 1. Requirement Analysis |  |
| 1. Create Product Backlog |  |
| 1. Setup Development Environment |  |
| 1. Initial Feasibility Study |  |
| 1. Initial Project Plan |  |
| 1. Initial System Design |  |
| 1. Initial Object Design |  |
| Milestone: Feasibility Study and Project Plan Document |  |

(Not complete)

## **Appendix**

### Appendix A - Project schedule

Figure . Gantt chart showing project schedule

### Appendix B – Feasibility Matrix

### Appendix C – Cost Matrix

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Description | Quantity | Cost |
| Human Resources | Team members working on the design, development, and testing processes | 2 | $ 0.00 |
| Hardware Resources | Personal computer | 2 | $ 0.00 |
| Localhost Server to host website | 1 | $ 0.00 |
| Android mobile devices | 1 | $ 0.00 |
| Software Resources | Software (All open source) | - | $ 0.00 |
| Total |  |  | $ 0.00 |

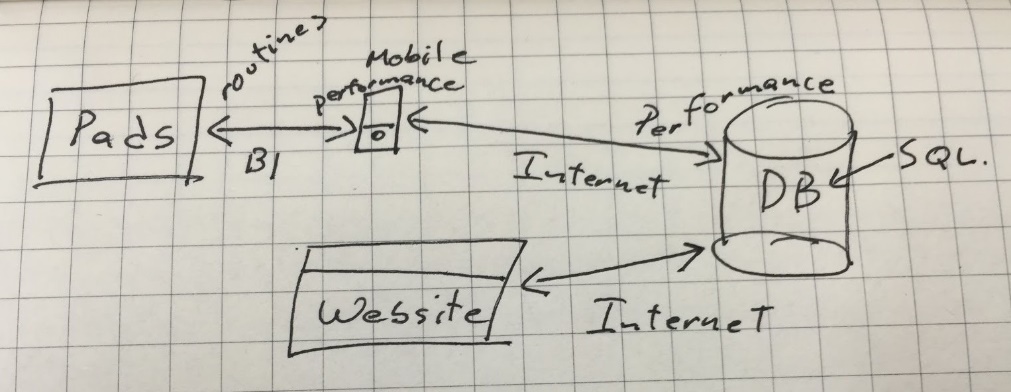
Table 2. Cost Matrix

### Appendix D - Diary of Meetings

|  |
| --- |
| **Meeting 1: Monday 1/19/15** |
| **In attendance:** Andy Martinez, Matthew Santiago |
| **@8:57pm**  Meeting on Mingle starts  **@9:08pm**  Arranging possible meeting times for Requirements Elicitation:   * Tuesday 1/20 9:00 pm * Wednesday 1/21 before 2:00 pm * Wednesday 1/21 after 7:30 pm   **@9:23pm**  Chose for Andy Martinez to be Scrum Master for the first sprint  **@9:28pm**  Sent message to @Product Owner for their preferred meeting time:   * Awaiting reply… * **1/20 @10:43am** Reply Received, Meeting Tuesday 1/20 at 9:00 pm confirmed   **@9:33pm**  Meeting Dismissed |

|  |
| --- |
| **Meeting 2: Tuesday 1/20/15** |
| **In attendance:** Matthew Santiago, Andy Martinez,  Jaime Borras, Gummi Traustason |
| **@9:00 pm**  Conference Call Started  **@9:02 pm**  Introductions  **@9:12 pm**  Stories:   1. Skill development (accuracy, speed, intensity)    1. User chooses skill to train from Android App    2. Measure pressure, time    3. 3 colors red blue green    4. Change to red when underperforming    5. Ball should take 5 seconds to hit the pad, turn red if user takes too long 2. Tracking and analysis    * accuracy, speed, intensity, reaction time 3. Single Player/2 Player    * Social Media Connection 4. Mapping a game  * Pad light up, hit pad with ball in proper time, another pad lights up, hit with ball in proper time, continue until you make goal (certain number of successful iterations) * Beginner, Intermediate, and advanced levels  1. Simulator (simulate a pad)    * Android application? 2. (Backend look at particular game (real game) and simulate a player or play within that game)   **@9:32 pm**  Set meeting with Gummi on 1/21 at 11:00 am in GL 693  **@9:38 pm**  Meeting Dismissed |

|  |
| --- |
| **Meeting 3: Thursday 1/22/15** |
| **In attendance:** Matthew Santiago, Andy Martinez,  Jaime Borras, Gummi Traustason |
| **@9:00**  Conference Call start  **@9:07**  Review stories  Predetermined Routines:   * Separate Goal Simulation into its own story   Performance Statistics:   * Add statistics about specific game   Competition Mode:   * Separation of social media into a new story is good * Have different routines for single and multiplayer   Custom User Routine:  Pads Simulator  Real Game Simulation:  Social Media Sharing:  Website:   * (Differentiate between coach and player?) * Webpage access   **@9:46**  Meeting Dismissed |

**

|  |
| --- |
| **Meeting 4: Tuesday 1/27/15** |
| **In attendance:** Jaime Borras, Andy Martinez, Matthew Santiago |
| **@ 6:30 pm**  Meeting starts  In attendance: Jaime Borras, Andy Martinez, Matthew Santiago  **Github upload schedule:**  Matthew upload from 10:00pm - 10:59pm  Andy upload from 11:00pm - 11:59pm  **Weekly in-person meeting:**  Thursday between 2:00pm - 6:00pm to prepare for weekly meetings with project owners  **Coding standards**  Comment Convention:  */\*\**  *\* Comment goes here*  *\* and here*  *\*/*  *fun()*  *{*  *random code*  *}*  **Indentation:**  1 tab per pair of curly braces  **Variable names:**  private \_variableName  public variableName  **Reports:**  **Matthew:** Feasibility report & Initial System Design  **Andy:**  Project Plan & Initial Object Design  **Read up on:**  Android BlueTooth library  Java Databases |

## **References**