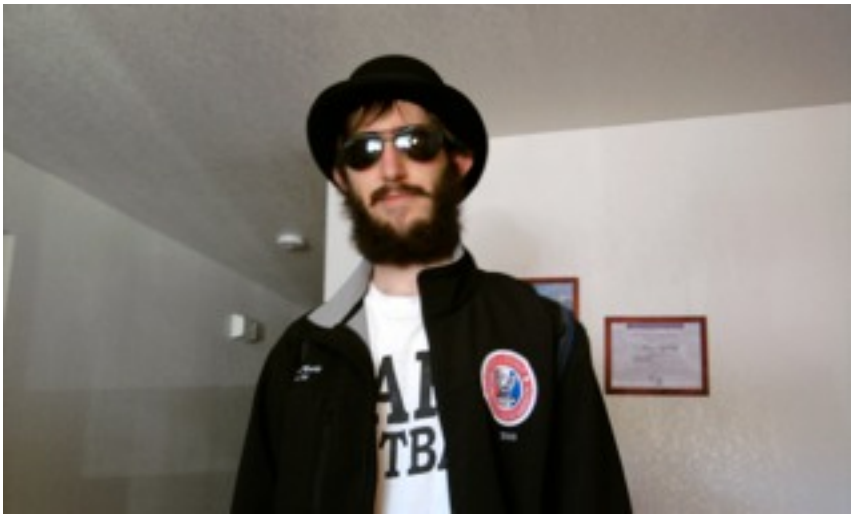
Dear Aziz Makhani and Bruce Bolden:

Follows is the final report on Kickshot for Android.

Sincerely,
Zachary Curtis
Rhys Perry

Cover Page

KickShot for Android



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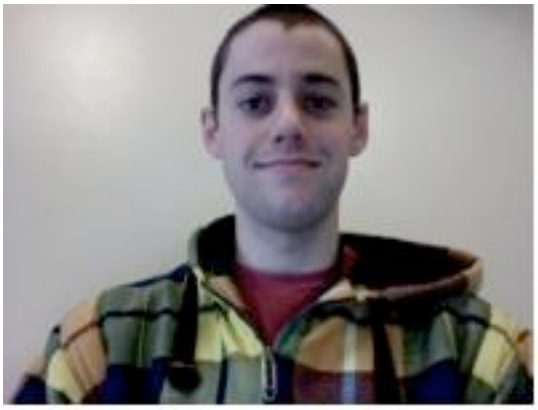

Rhys Perry
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Executive Summary

This report describes the process behind designing an Android application version of Aziz Makhani's soccer board game KickShot. Follows is a summary of project needs, solution features, and business merits.

NEEDS

An integrated development environment (IDE) for Android would be needed for coding. Also needed were methods for testing to confirm that the project met expectations. Knowledge of Java and extensible markup language (XML) would be required to develop a fully functional Android application.

Eclipse IDE with Android software development kit (SDK) and Android developer tools (ADT) were downloaded from Android developer website <http://developer.android.com/index.html>. Testing would be done using Android device emulators that come with Eclipse IDE with Android plugins and personal hardware. Members of this team have had previous experience with Java in programming classes. However, XML needed to be learned throughout the project work.

SOLUTION FEATURES

Neither team member could be guaranteed to be working on the project at the same time or in the same location. Team members collaborated to create a Google repository used as cloud storage where changes would be made to the project. Other solution features such as IDE and testing equipment can be found under the *Needs* section above.

BENEFITS

A completed version of the KickShot for Android application could be sold on the Google Play market for profit. If profit is not something of interest, it can be made a free application, serving to entertain and educated the gaming community and advertise for Makhani. To upload an application to Google Play Store visit <https://support.google.com/googleplay/android-developer/answer/113469?hl=en>.

MOTIVATION

I recently became an Android device owner. I love its open source and friendly, creative community. My enthusiasm for the Android community and a desire to learn about application development, specifically graphics, were the two main reasons I chose this project.

- Rhys Perry

I chose the project because it would give me insight into programming different devices as well as give me a chance to work on my graphics programming.

- Zachary Curtis

NEED

Client Aziz Makhani was developing a soccer board game. His objective was to help young individuals better understand the rules of soccer. Expanding an electronic version of the board game into mobile OS application markets would drastically improve time to completion. Makhani needed a team to work on an Android version of the application. Makhani needed a team that would assess the current status of the project, determine long and short term goals, and continue to develop and improve.

BENEFITS

Expected benefits, some of which mentioned above, include what follows. The larger audience made available by mobile electronics will help Makhani achieve his goal of educating people about soccer. Makhani could sell a completed version of the game on Google Play Store for profit. If profit is not desired, a free version of the game could be made available to entertain, educate, and advertise for Makhani and his company.

PROBLEM DEFINITION

The end goal is to incorporate Aziz Makhani's soccer board game, KickShot, as an application for devices running Google's mobile operating system (OS), Android.

Deliverables include the following:

1) Updated artwork image files

2) Updated game rules

3) Improved code

    1) Descriptive comments

    2) Proper formatting

4) Future suggestions for the project

5) Project design report

PROJECT/TEAM REFLECTION

This project gave two engineering students the opportunity to collaborate on something in their area of expertise. It prepared them for careers in their field through development of leadership, teamwork, and communication skills.

However, because this team started with existing code that lacked significant comments and modularity that allowed for adaptation to new rules, starting from scratch is suggested.

CONCEPTS CONSIDERED

In terms of the final product, there was only one concept to consider: an application that represents the board game in every aspect of gameplay and visuals. In terms of how to accomplish this final concept, this team wanted to focus on modularity to emphasize maintainability and extensibility (Fig. 1).

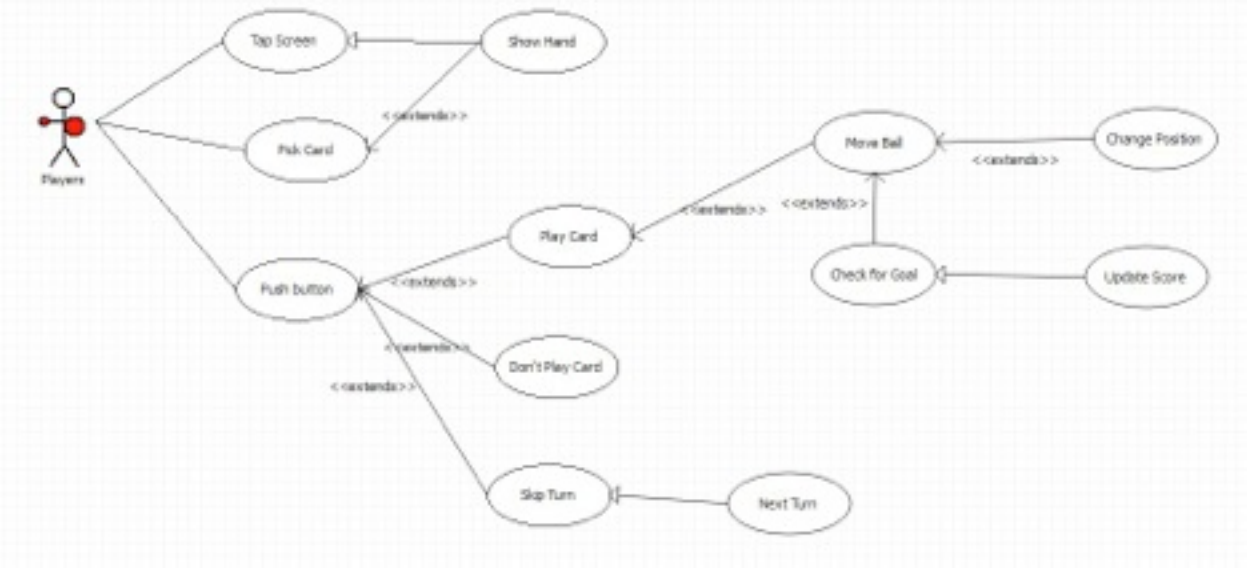

Figure 1. Model View Controller scheme.

Figure 1 shows modularity that emphasizes the following:

1) Compatibility - interacts with most versions of android

2) Extensibility - new capabilities can be added easily

3) Maintainability - easy to reduce and remove bugs

4) Modularity - well defined, independent components

5) Reliability - able to perform specified function w/o crashing

6) Reusability - add more features, or upgradable to other versions

7) Robustness - able to run on low memory

8) Security - software is not easily attackable

9) Usability - easily usable by the target audience

10) Performance - all work done within acceptable time limits

11) Scalability - Designed with the ability to scale up in mind

CONCEPT SELECTION

The Model View Controller scheme was chosen because of its ability to keep things separate and modular. This allows for the program to achieve concepts mentioned above such as maintainability and extensibility.

SYSTEM ARCHITECTURE

The conceptual design is as the board game instruction booklet describe the simplest game type. Novel features added throughout our work include improved animations, updated artwork, and corrected application icon and name. We also fixed the main menu background artwork and main menu play button. Each of these improvements get the project closer to its end goal.

FUTURE WORK

Future work on this project should use existing code as a reference, not as a foundation upon which to build further. Problems were encountered regularly building on existing code lacking comments and modularity. It had not been created with expansion in mind. The majority of time on this project was spent determining what was accomplished by existing code and how it must be modified to achieve end goal.

Goal for this semester was to complete the simplest version of the game where two players use the same device and not all cards are used. The abundance of problems encountered inhibited progress. The semester end goal of the a working simple version of the game was not met. However, artwork and some game functionality was updated.

Rough estimated time for completion is six months. Time frame depends heavily on weekly time committed to the project and knowledge of Android development. If treated like a full-time job, this project could be completed in three months.

Appendices

Eclipse IDE with Android SDK and ADT
<http://developer.android.com/tools/sdk/eclipse-adt.html>

Google repository (access privileges required)
<https://code.google.com/p/kickshotcs481/>

KickShot Soccer Facebook Page
<https://www.facebook.com/KickShotSoccer>

Senior Design Team Website
<http://seniordesign.engr.uidaho.edu/2012-2013/soccer_android/index.html>

Project code and images are stored on the accompanying DVD.

To Do List April

TODO:

- Figure out problem with dice // they work fine on the simulator but crash on Rhys' phone
- Fix the evaluation so that the game stops crashing
    - The game crashes somewhere near the evaluation function and before players change
- Implement the playerchanging function //game currently does not change players
    - This will increase the player counter to move the game forward
- Implement Ref cards x//ref cards are not in at the moment
    - This will be done by creating another deck that both players can draw from
    - If a player does not have a ref card, they will draw one
    - If there are no more ref cards, a player will draw a card out of their respective deck
- Change rules as necessary //Aziz has updated the rules a few times, this will get done if there's time
- Replace the old images with the new ones //Aziz had new cards made with updated rulings so that they were more clear to the player
- Comment all of the code so that if/when somebody else gets this project they understand from the code // there are almost no comments on the code at all making it difficult to understand
- Finish code for the "Discard" and "Skip" buttons

COMPLETED:

- Fixed the ball changing possession after ANY card was played
- Fixed the menu background
- Accomplished minor comments
- Fixed main menu name
- Fixed application name
- Fixed application icon
- Updated all artwork to most current 2013 April 11