Project Proposal – Xamarin.UITest Automated Unit Testing vs. Monkey Tool

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1. Introduction

For my senior design project, I am developing a mobile application with a heavy focus on user experience which would benefit from the use of testing tools. Additionally, I am developing my application with Xamarin, an open-source app platform for building modern cross-platform mobile applications with C#. Xamarin has its own testing framework Xamarin.UITest for creating automated user interface tests but does not auto-generate tests itself. Due to its lack of auto-generation, I have found a tool for mobile UII automatic testing for android called Exerciser Monkey which generates pseudo-random streams of user events to your application. I am proposing to compare the efforts and results of Xamarin.UITest with the monkey tool. Though Xamarin.UITest requires that I write the tests myself, I would like to see if the effort involved with writing the tests yields a more beneficial result than the Exerciser Monkey tool. I will base my comparisons on simplicity of use, time spent setting up, and clarity of the results.

2. Background

Xamarin is an open-source app platform which offers cross-platform compatibility. There is a framework called Xamarin.Forms which allows developers to have a single shared codebase for their Android, iOS, and Window applications. There also exists a native Xamarin which simply focuses on one OS at a time. Xamarin.UITest allows testing both apps written with Xamarin.iOS and Xamarin.Android, allowing me to test both targeted systems at the same time. Exerciser Monkey is an external tool which follows the same concepts as a traditional monkey testing tool, but only works for Android OS. For this reason, the following project will focus on the Android version of my mobile application.

3. Preliminary Results

I do not have previous experience with either of these mobile testing tools, but Xamarin.UITest supports writing test scripts with NUnit, which I do have prior experience with from a previous co-op. I have read about the Exerciser Money tool, and up until now it seems straightforward to implement. No other preliminary results as of yet.

4. Feasibility

Regarding the milestones for this project, I will focus on these three stages:

1. Set up of tools

Following the integration of the Xamarin.UITests tool, I will select the targeted functionalities to base my unit tests on. I will also set up Exerciser Monkey for my application. The time and effort for both tasks will be tracked.

2. Run the tools

   After integrating both the Xamarin.UITest tool and Exerciser Monkey tool, I will run the unit tests from the first tool, and then run the second tool for a set amount of time and/or runs. The results of the tests will be tracked.

3. Compare the results

   I will conduct an empirical study to compare the time spent on, effort required, and test results of each tool. Based on this study I will determine the tool which I found most beneficial. I search to answer the following research questions:

5. Merit

As these tools will be integrated into my senior design project, I will directly benefit from the results of both tools. The findings of the tests will allow the end users of my application to have a more pleasant experience with it.