D&D Knowledge Management Information Tool Feasibility Study for Cross-Platform Mobile Applications

Steve Noel - DOE Fellow, Mentor - Dr. Himanshu Upadhyay
Applied Research Center, Florida International University

Introduction

• The D&D Knowledge Management Information tool (D&D KM-IT) is a web-based knowledge management information tool built for the D&D user community. A feasibility study is being conducted on cross-platform application frameworks for their viability to the D&D KM-IT mobile needs.
• Currently, three main Operating Systems comprise the majority of the mobile market: IOS, Android, and Windows, requiring a separate application for each device (Figure 2).
• Cross-development software allows the development of one application using one language, that can be ported or deployed on multiple devices with little effort (Figure 1).

Methodology

• Using Xamarin, a native cross-platform framework, create a shared mobile application using Visual Studio.
• Build a D&D KM-IT mobile application designed for the three major mobile platforms
• Use Xamarin to compile the application into native applications for the three target platforms.
• Build and deploy the application on all three mobile platforms.
• Perform benchmark tests of the developed applications to analyze the performance on the three platforms.

Results

• A large portion of the business logic of the application has been shared, eliminating development redundancy and minimizing planning, design, and validation time.
• The user interface development could not fully be shared cross-platform and some platform specific code must be individually implemented for each device.

Conclusion

• Maintenance, testing and design phases of the software engineering process were reduced from one for each device to having just one shared cycle processes.
• A less diverse skillset for developers is required with cross-platform development.
• Some processes within the development cycle still require redundant activities.

Figure 1. Cross-Development Software

Figure 2. U.S. phone Market Share

Figure 3. Minimum avg. development cost for app (amounts in tens of thousands of dollars)