



Olympic NXT Android Gaming Application

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Abstract: *The increasing number of android users, and the demand for various applications and games has motivated various developers to create interesting and games on the Android platform. We hope to do the same by creating an entertaining and visually appealing game based on four of the Olympic events, namely 100m sprint, 110m hurdles, Long jump and Javelin throw. Our game is a single-player game on the Android platform. In the game, the player will have to show extremely good timing and superb reflexes in order to win. The 110 m hurdles will require the player to run extremely fast and avoid the various hurdles by quick swipes on the screen. The javelin throw will require the player to throw the javelin at a precise angle in order to succeed. The games will require resourcefulness and presence of mind. The platform of the game is Android having Front End as Unity 3D and Back End as JAVA/CSharp. Smartphone users have a desire not only for games in general, but for quality games that provide them entertainment and a level of challenge too. Thus games need to be constructed in a way that is organized and well planned to give the users the best experience possible. Thus we will try to create a game which is extremely entertaining and intriguing with great graphics to make it visually appealing.*

Keywords: *Android platform, Unity 3D, Olympics*

I. INTRODUCTION

The android based gaming application that we intend to develop is based on four popular Olympic events. This will be developed largely on Unity 3D. Our first goal was to familiarize ourselves with the functioning of the Unity 3D software, with all its assets, game objects, controls and other features. The aim of this project is to create an android based gaming application. The game can be considered as a Role Playing Game(RPG). In a role playing game, the character assumes the role of the player, takes up new challenges and overcomes them. It also interacts with non-playable characters (NPC). The non-playable characters in our game will be obstacles, javelin, running track. The main character will communicate with the non playable characters to fulfill the goal of the game. The project includes different modules for each of the events, development of a good user interface, development of game objects and characters, and their movements and actions, using Unity 3D software. This will then be linked on the Android platform using Java. The game is a single player game. The player will progress through levels which require precise manipulation of the environment, though the game encourages creativity and daring via hurdles and challenges.

The paper will describe the system that will be developed, the functional requirements of the game, the basic architecture and the various phases involved in game design.

II. Literature survey

Android is a relatively new platform. Android is installed on many different mobile devices and its users can download Android apps and other content through Google Play service.

As is described in the official Android website, Android is a software collection for mobile devices ,based on the linux kernel, that includes an operating system, middleware and key applications.

The Olympic video games consists of several events that were played during the actual Olympics. These were developed in the early stages of video game development, with the first games appearing in 1983. After that, several titles have been released.

Epyx, Accolade and Konami are few of the companies that developed many of the early games. The genre was often considered just as memorabilia attached to the event.

Existing Literature Deficiencies:

The basic deficiency is that the Olympic games were only designed as video games, and have not yet been designed for the android platform. Therefore, through this project, we aim to build an interactive Olympic game on the android platform.

Even though most of the research on android is comprehensive, there is not much support for specific project problems. First of all, there is no methodology which describes which development technique can be used for which specific feature. We need to establish a proper determination process. ^[9]

Second, techniques that are available as of now do not provide step-by-step instructions.

Systems vary in different environments, and development techniques also need to be changed simultaneously. In addition to this, security policies vary as well.

Third, it cannot be stated with certainty that all Android Mobile Application features can be implemented.

These three problems provide research topics for this Project.

This project describes a development process for the Android Mobile Game application. It begins with the definition of the intended features for this application and continues with the descriptions of the game design using Unity 3D and the fundamental Android development concepts. Based on the analysis of those features, the development techniques are derived by combining the mutual similarities and the common data access points.

III. Feasibility Study

Feasibility study is done basically to evaluate the potential of any system, and to analyse its strengths and weaknesses. It is also used to determine opportunities that a system can offer. As far as our project is concerned, our system is economically viable and has low maintenance cost. It will be user friendly and intriguing for the users, and thus will be a feasible option in all possible aspects.

IV. Existing system

Initially, these games appeared as video games, first appearing in 1983. Olympic video games were those games which contained several events. These games were first released in 1983. Since then, various titles and versions have been released. But these games were never developed on the android platform.

V. Proposed system

Since the Olympic games have never been developed on the android platform, we hope to create an interactive game on Android.

Table 1: Functional Requirements of the system.

Sr. No.	Function	Description
1	Gravitational	The touch pad effect on rotation must be scaled so that the player is able to manipulate the level with precision. Different surface inclinations must affect the player velocity vector. Levels should be designed to take advantage of the implications of this game mechanic.
2.	Jumping	Levels should be adapted to this standard jump. Jumping should take into account the current vertical and horizontal velocities as well as the surface inclination. Jump force should be large enough that the mechanic is not made useless but not so large that gravity rotation can easily replace the effect.
3.	Title Screen	The splash screen must load and appear every time the game is launched. If the player quits the game during any stage of an event, they must be returned to the title screen. If the player presses the exit button, the game will end and return the player to the phones regular interface. If the player completes the game, the game will end and return the player to the title screen.
4.	Event Selection Screen	This screen will list out the four events that our game offers: 100m sprint, 110m hurdles, long jump and javelin throw. The user will have an option to select one of the events.

The system's architecture consists of a set of user input, which is applied to the game logic. The android framework is a set of API's (Application Programming Interfaces) that enables developers to write applications for android phones. Application programming interfaces describe how software components interact with one another. The android framework consists of tools and methodology for designing user interfaces like buttons, image panes, text fields. It also contains system tools for opening files, phone controls, and media players. Any android application consists of Activities which are programs that the end user interacts with, services that are programs that provide some function or use to other applications, and broadcast receivers which are programs that trap information important to our application.

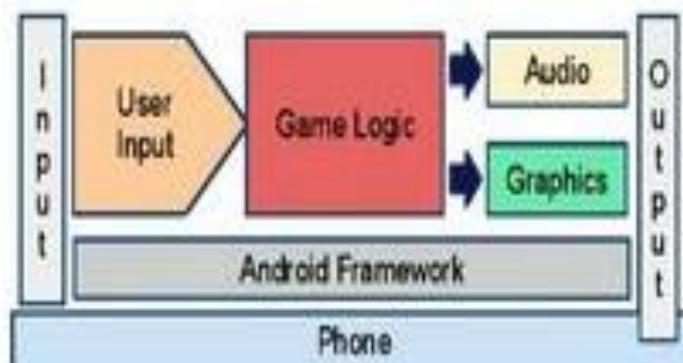


Fig. 1 System Architecture

VI. Experimental Study

Android is an open source operating system developed by Google. On an average, 75% of the mobile market share is covered by Android..It provides a superb platform for creating apps and games as well as an open marketplace for distributing them instantly. Thus, we aim to create our game on the android platform. In this way, we can develop an interesting, user friendly game with the help of Unity 3D software, which can easily be played by maximum number of people.

VII. About Unity 3D

The Unity game engine was developed by Unity Technologies in Denmark. It is a combination of a custom engine, the “nVidia PhysX” physics engine and “Mono”, which is an open source implementation of Microsoft’s .NET libraries. The Unity Engine provides complete documentation of all the APIs and this is its biggest benefit. [6]

Some appealing and interesting features of Unity 3D are:

Drag-n-Drop: In Unity, all the content is listed in a tree format and that content can be added to an environment in a drag-n-drop manner. Objects like a capsule or a character control present in the environment are listed in a separate tree, and each can be assigned multiple scripts written in C# and UnityScript, and can also be assigned physics and rendering properties.

By using physics properties, objects can be given mass, drag, springiness, bounciness, speed, direction and collision detection.

Multiplatform Distribution: The Unity engine’s editor runs on OSX which is a Unix based graphical interface operating system. But applications created using Unity can be compiled for OSX, Windows, or as a Web-Player. Thus, there are no restrictions on distribution of applications created with Unity.

Low Cost: The Unity engine has a pretty low cost for a complete game. The normal version of the engine is US \$199 and the Pro version, is US \$750. This pricing is comparable to Torque, but Unity’s Editor is much easier to use than Torque. Also, if the Unreal or Source engines were used, the cost for engine license and documentation would go way beyond US \$300,000.Thus it is much more feasible to use the Unity engine.

One of the important features of Unity is its extensible plug-in architecture which enables developers to extend the built-in functionality by enabling the creation and linking in of external libraries. [7]

The method for executing C++ code from within Unity is through conversion of the standalone C++ code/application into a ‘.bundle’ file. A bundle is dynamically loadable code in which individual methods can be executed individually, the bundle simply makes the C++ code importable into other environments (Unity) that do not directly support the C++ language.

VIII. Phases of game designing

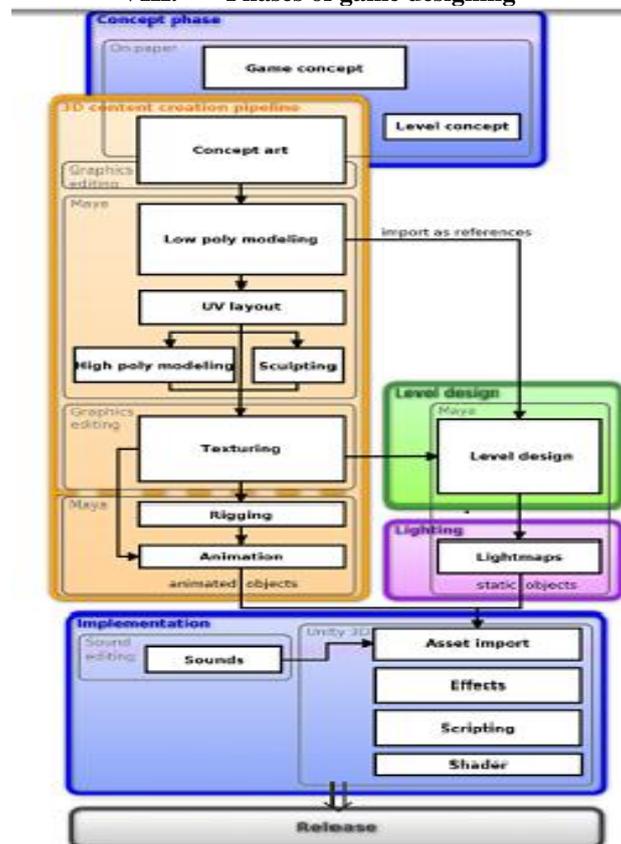


Fig. 2 Stages of game design

IX. Advantages

An interesting and exciting game can be created on the Android platform which can be very easy to download and install. The Olympic video games were never developed on the Android platform and they are no longer available even in the video game format. Thus we can give thousands of Android users an enticing Olympic based game.

X. Conclusion

This project describes a development process for the Android Mobile Game application which is developed using Unity 3D. It begins with the elicitation of the intended features for this gaming application and continues with the descriptions of the fundamental Android development concepts. Based on the analysis of those features, the development techniques are derived. The project intends to create a visually appealing and interesting gaming application based on four of the Olympic events. It details the various requirements, functional and non functional, of the game and the various features that it would portray. The game is created using the Unity 3D software and then run on the android platform.

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