Software Requirements Specification

POWER EFFICIENT ANDROID ROM

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Chapter 1

Introduction

1.1 Purpose

The purpose of the system is to improve the power efficiency of the android device by building a customized android ROM(similar to an operating system) which would make the installation of the stock applications optional. Power efficiency will also be improved by making changes to the kernel to bring about controlling the processor speeds to obtain maximum power efficiency. In building the ROM from the source code additional features like support for native languages like Malayalam can be brought about. By implementing the project we hope to extend the battery drain to more than two days.

1.2 Scope

This project is useful to people who would like to have a better battery drain such as business people who travel a lot and find it difficult to frequently charge their phones. The support for native languages will also be attractive to people who are not proficient in using English.

1.3 Definitions, Acronyms & Abbreviations

1.3.1 Definitions

- **JDK** :- The Java Development Kit (JDK) is an Oracle Corporation product aimed at Java developers. Since the introduction of Java, it has been by far the most widely used Java SDK. On 17th November 2006, Sun contributed the source code to the OpenJDK.

- **Android SDK** :- The Android Software Development Kit (SDK) includes a comprehensive set of development tools. These include a debugger, libraries, a handset emulator , documentation, sample code, and tutorials. Currently

supported development platforms include computers running
Linux(any modern desktop Linux distribution), Mac OS X
10.4.9 or later, Windows XP or later. The officially
supported integrated development environment (IDE) is
Eclipse using the Android Development Tools (ADT) Plugin,
though developers may use any text editor to edit Java and
XML files then use command line tools (Java Development Kit
and Apache Ant are required) to create,build and debug
Android applications as well as control attached Android
devices (e.g., triggering a reboot, installing software
package(s) remotely).

- **AVD** :- AVD is the android virtual device , which is helpful
  in running the application in a computer.
  AVD is a virtually creates a mobile device,which helps in
  running the application in a computer. The program running
  in AVD seems to be like running the application in android
  mobile phone.

- **Ambiguity between SDK and JDK** :- The JDK forms an extended
  subset of a Software Development Kit (SDK). In the
  descriptions which accompany its recent releases for Java
  SE, EE, and ME, Sun acknowledges that under its
  terminology, the JDK forms the subset of the SDK which
  has the responsibility for the writing and running of Java
  programs. The remainder of the SDK comprises extra
  software, such as application servers,debuggers, and
  documentation.

1.3.2 Abbreviations

JDK :-Java Development Kit
SDK :-Software Development Kit
NDK :-Native development kit
AVD :-Android Virtual Device

1.4 References

- http://developer.android.com/index.html
- http://forum.xda-developers.com/
- https://developers.google.com/
- www.droidforums.net

1.4.1 Document Overview

Section 1 is an introductory chapter which explains the purpose of the project,scope and references.
Section 2 contains the overall description of the product including the product perspective.
Section 3 describes various functional requirements that are the product should have.
Section 4 describes the non-functional requirements of the product.

Chapter 2

The Overall Description

2.1 Product Perspective

In today's Smart Phone market the issue of power consumption is not given its proper due. Manufactures fill the stock ROM with many applications of which most are not required by the average user. These applications take up valuable power and memory resources even when they are not being used . Due to these reasons Most Smart phones provide a battery drain of one and a half days at the most.

2.1.1 Product Functions

• Overclocking

• Ability to change fonts

• Increased power efficiency/better battery drain

• Application installation on SD card

2.1.2 User-classes and Characteristics

By user classes and characteristics we are broadly defining the users who need frequent use of this product and the various requirements of each particular user classes.

- The Android mobile users are the main user of the product, so the user class is very large and the usage will be important now a days because of the highly usage of memory capacity of sd cards.

- This project is useful to people who would like to have a better battery drain such as business people who travel a

lot and find it difficult to frequently charge their
phones.

2.1.3 Operating Environment

The environment of operation has two modes in the android
application building and deployment.
Because the testing of application requires an avd virtual
device. The virtual device can be downloaded from the Android
Developers site. And the deployment of application requires a
smart mobile phone that uses an android platform operating
system.

Hardware Requirements

Application development is done through a computer system. And
it works in a mobile phone.
  * Processor:Intel i3 or above.
  * RAM : 4 GB
  * Hard Disk:about 80 GB.
  * Android Platform mobile phone which supports Android 2.3.X .
  * A memory card.

Software Requirements

The software requirements at developers side and users side are
given below.

  * Developer need The Android SDK, java JDK, And different
    APIs and AVD s according to the mobile operating system.
  * An environment for creating the Android Rom like Android
    Kitchen is required for the developers.
  * A good tool for software testing is required for assuring
    the dependability of the system.

2.1.4 Design And Implementation Constraints

The designer needs to build the application according to the
available hardware

2.1.5 User Documentation

 User Manual:-The users are provided with a brief user manual which includes the method of installation and the functionality offered.

2.2 External Interface Requirements

2.2.1 User Interface

Users are provided with a graphical user interface which enables the user to access the functionality provided by the ROM.

2.2.2 Hardware Interface

The hardware interface is inbuilt in the mobile phone.

2.2.3 Software Interface

It is the interface needed to scan the hardware capabilities of the device.

Chapter 3

Functional Requirements

3.1 Available services

The available service is the ability to increase the battery drain of the device together with providing extended customization.

3.2 Increment Services

The services that can be incremented to the application includes:

- **Customized Installation**

    The application can be modified to include option for installing applications according to the users choice.

- **Native Language**

    The application can be upgraded to include support to Native Languages like Malayalam.

Chapter 4

Non-functional Requirements

4.1 Performance Requirements

The main performance requirements that the product should satisfy are :

- Speed :- The performance of the ROM must be fast when compared to the stock ROM
- Ease of use :- The application must be user friendly, even if more functions are included it should be easy to use.
- Battery performance :- The Battery Drain of the device should be better on the Customised ROM than on the Stock ROM.

4.2 Safety Requirements

When the program is running the system should not be slow. The system should perform well without crashing.

4.3 Security Requirements

The developed ROM should not have software bugs that can be exploited.

4.4 Software Quality Requirements

The most important quality requirements that the application should satisfy are:

4.4.1 Maintainability

Software maintenance in software engineering is the modification of a software product after delivery to correct faults, to improve performance or other attributes. A common perception of maintenance is that it merely involves fixing defects. However, one study indicated that the majority, over 80 percentage,

of the maintenance effort is used for non-corrective actions .
This perception is perpetuated by users submitting problem
reports that in reality are functionality enhancements to the
system.
In case of our ROM,it can be maintained properly by updating the
ROM.

4.4.2 Adaptability

The adaptability of can make it perform better. The product can
be said to be adaptable if the model changes with according to
the requirement of the user.

4.4.3 Reliability

A set of attributes that bear on the capability of software to
maintain its level of performance under stated conditions for a
stated period of time is called the reliability of that product.
The product must be reliable to users. It must be user friendly.

4.4.4 Accuracy and Efficiency

The product must be accurate to the information, in our case the
output of the product must be accurate, it will make that
product an efficient one. The efficiency of the product is also
determined by several other conditions and state. The speed and
ease of use are some of those.

Chapter 5

Conclusion

The mini project aims to implement a Customised ROM for android device. It requires more knowledge about the tools that can be used to implement such application. Building such an application helps to learn about the new technologies adapted to implement and design different software products. It can be tested in the android avd manager and can be deployed in HTC Wildfire.