B3: An Automated Cross-Platform Mobile Bible Application.

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ABSTRACT

The Bible is one of the best-selling books of all time. It is a historical text as well as a religious text, capturing some of the most remarkable stories of mankind and its relationship with God the creator. With the advancement of technology, the distribution and communication of this book has found its place in computers, both fixed and mobile. The problem with most Bible software is that it does not present the scriptures in a format that is easy to read and follow in the mobile context. It offers developers a lasting solution to the conflicts that arise over native and web application development. The main objective of this research is to develop a widget application titled the B3 application, which will increase the accessibility of the Bible and other Bible-related content using a mobile phone. In developing the application, HTML5 and Cascading Style Sheets (CSS) are used to design the structure and layout of the webpages; Javascript serves as a scripting language to perform client-side processing of data; extensible Markup Language acts as the data storage for the Bible combined with Asynchronous Javascript and XML (AJAX) for data retrieval. These software tools provide readers of the Bible with a mobile bible application with easy accessibility and simplicity for the end users.

(Keywords: Bible, B3, Cristian text, KJV, mobile phone, mobile computing, Javascript, XML, AJAX, HTML5, CSS)

INTRODUCTION

Mobile Computing is defined as the ability to use a computer while moving from one location to another. Mobile computing usually involves some form of wireless transmission, but not all wireless transmissions imply mobile computing (Mobile Computing Definition from PC Magazines, 2012). Mobile Computing devices include handheld computers, palm-tops, personal digital assistants (or PDAs), pocket-sized computers, smart phones, among others (Paul, 2009). Mobile phones have become increasingly popular, especially in the area of social networking. Applications for mobile phones are traditionally written in the native language of the phone in question. The native programming language usually differs from one phone to another.

The Bible is a religious book that contains the Word of God and is used by Christians. It is traditionally, printed in books of different sizes, translations and languages. In an effort to share the Word of God, many translations and versions of the Bible have been made in many different languages. This has allowed the Bible to become a book that is read all around the world by persons of varying ethnicity and dialect.

In attempt to further increase the spread and accessibility of the Bible worldwide, various Bible applications - designed to read and search through the scriptures - and other Bible-related software have been developed by different induvidals and groups for computer systems. Examples of Bible applications for desktop systems are E-Sword and PC Study Bible, among others. The use of computers in providing readers access to the Bible allows for quick scripture referencing and searching. This improves the overall reading experience as readers do not have to search throught the entire Bible by hand in order to find a certain scripture.

Another means of accessing the Bible in today's digital society is through the use of online websites such as Bible gateway (QPSwordontheZaurus, 2002). These online websites provide users with a web interface where the opening of and searching through of

verses in the Bible can be done by selecting books and chapters from drop-down boxes and inputting search criteria into textfields, respectively. These websites also offer users a lot of audio and video content such as audio Bibles or sermons. They can be accessed using desktops, laptops, and handheld devices with web capabilities. The Bible has also recently found its way to the handheld devices through the mobile computing platform. The portability of mobile devices makes them an excellent choice as a media for transporting the Bible. Examples of Mobile Bible Applications are Youversion, Go Bible, Palm Bible, among others.

In recent years, the activity of reading the Bible has been made widely available through the introduction of websites, online forums, desktop Bible software, e-Bible gadgets, and mobile applications as mentioned above. However, there are several challenges that are associated with each of the methods mentioned above. The problem with most Bible reading software is that the format of presentation is not easy to read and navigate. The objective of this study is to develop a widget application known as B3, that will increase the accessibility of the Bible and other Bible-related content. The B3 application will be accessed through a mobile phone. The system was implemented using Notepad++ 5.9.8 and the Ripple Mobile Environment Emulator 0.9.1, a PhoneGap (Apache Cordova) solution for cross-platform mobile web application development.

LITERATURE REVIEW

In the past, there has been several Bible projects, all working towards increasing the accessibility of mobile Bible application. Some of them are discussed in this section.

The Sword

The Cross Wire Bible Society is an organization which provides open-source tools for creating Bible software. This society provides a platform for engineers to work together in creating cross-platform Bible software (JISC, 2009). The society introduced a Bible software development platform to accomplish this task namely, the SWORD Project. The SWORD Project is a cross-platform library which is written in C++ and is used in the creation and distribution of Bible

texts and biblical resources such as Bible texts, commentaries, dictionaries/lexicons, and glossaries.

Go Bible

Go Bible is a micro-Bible reader created by Jolon Faichney. This application is based on the J2ME (Java Micro Edition) platform and supports several features such as bookmarks and history, compressed data storage, fast search. Its major limitation is a reduced functionality with phones, which do not have left or right buttons (AboutGoBible, n.d.).

SwordReader

According to the Griffitts, (n.d.), SwordReader is a Bible application that is specifically targeted at the Windows Mobile platform. It was developed using C++ and is based on "The SWORD Project". It offers multiple Bible versions such as American Standard Version, King James Version, several commentaries and dictionaries with lexicons and daily devotionals.

PalmBible+

The PalmBible+ is a Bible application which was developed in 2003 for Palm-OS based PDAs as well as Sony, GSL and Handspring PDAs. It was developed out of an extension to Bible Reader by Poetry Poon. This application features text notes, auto-scrolling, bookmarks and three different search types: terms, phrase and Boolean search query (Wright, n.d.).

Go Bible, PalmBible+ and SwordReader are all efficient mobile Bible applications in their own respective rights. However, their platform-dependency is a major drawback for potential users who do not have the required mobile device or operating system to use these applications. This limitation reduces the number of individuals who can access and use the software to those who have a Sony, GSL, Handspring, Zaurus, iPaq or Palm-OS based PDA.

The B3 application in contrast to these three applications is based on the HTML5 specification - which is set to be an official W3C recommended standard in 2014. This makes it a

platform-independent mobile Bible application, which is able to run on any mobile device, as long as the device supports HTML5. Although it is not an official standard yet, it has already been implemented in some browsers such as Google Chrome 18.0, Safari 5.1 and Opera 11, among others (Shankland, 2011).

The B3 application will feature a help page with basic information on how to use its features. This will allow users to perform tasks easily and quickly. Also, the interface of the application will be user-friendly and simple to understand. Finally, the B3 Bible application will separate navigation from text display by providing a navigation bar at the top of the user interface.

ARCHITECTURAL DESIGN

The architectural design of the B3 system comprises of Presentation, Application and Data tier (see Figure 1).

Presentation Tier (Tier 1): The webpage and the scripting files that correspond to each of the web pages can be seen in the presentation tier of the three-tier architecture. This tier is composed of the interface (and some control) classes of the entire system, which receive input from the user and display the output of the system's processes.

Application Tier (Tier 2): The server-side scripting languages can be seen in the application tier of the three-tier architecture. This tier is composed of the control classes of the entire system, which processes user request to generate the relevant output. They also retrieve required data resources from the Data Tier.

Data Tier (Tier 3): The stored files that are accessed by the control classes can be seen in the database-tier of the three-tier architecture. This tier is composed of the entity classes of the entire system, which contain relevant information and resources.
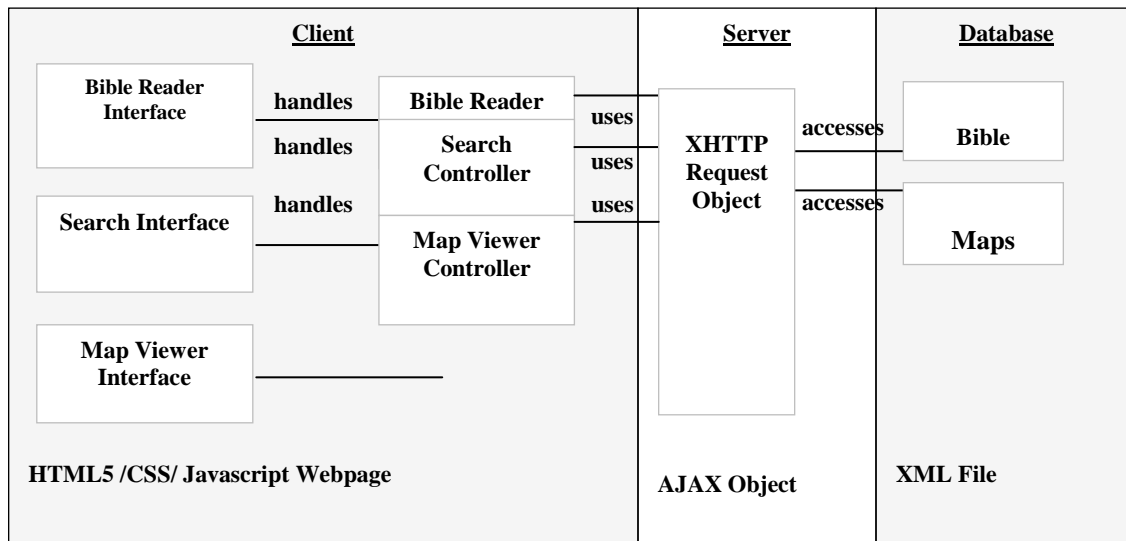

Figure 1: An Abstract Representation of the Three-tier Architecture.

Files Design

The files that are used as resources in the B3 application went through some design processes. The Bible that is used in the proposed system is to be stored in XML. The use of XML as data storage ensures that more devices will be able to read and understand the

data stored within it. The various tags that make up the XML file for the Bible has the following description:

<bible_version> – This tag describes the version of the Bible that this XML file contains such as <kjv> for King James Version.

<book> – This tag is a node which contains chapter nodes. It is used to reference books of the Bible such as <book tag = "2" > for Exodus.

<chapter> – This tag is a node which contains verse nodes. It is used to reference the chapters of a book of the Bible such as <chapter tag = "5"> for chapter five of the current Bible.

<verse> – This tag is a node which contains the text nodes of the Bible. The scriptures of the current chapter of the Bible are stored here in plain text format such as <verse tag = "3"> And God said, "Let there be light: and there was light" </ verse> for the third verse of Genesis chapter one.

Attribute Description
tag – this attribute is used to number the book, chapter and verse nodes outlined above, according to the book, chapter or verse of the

Bible they are supposed to represent. The structure of the XML file is represented in Figure 2.

<bible_version>
  <book tag = #>
      <chapter tag = #>
        <verse tag = #> [Scripture text goes
        here] </ verse >
        </chapter>
    </ book>
  </ bible_version>

Figure 2. An image of the structure of the KJV Bible XML file

The diagram in Figure 3 shows a diagrammatic representation of the interface of the Bible Reader Subsystem.
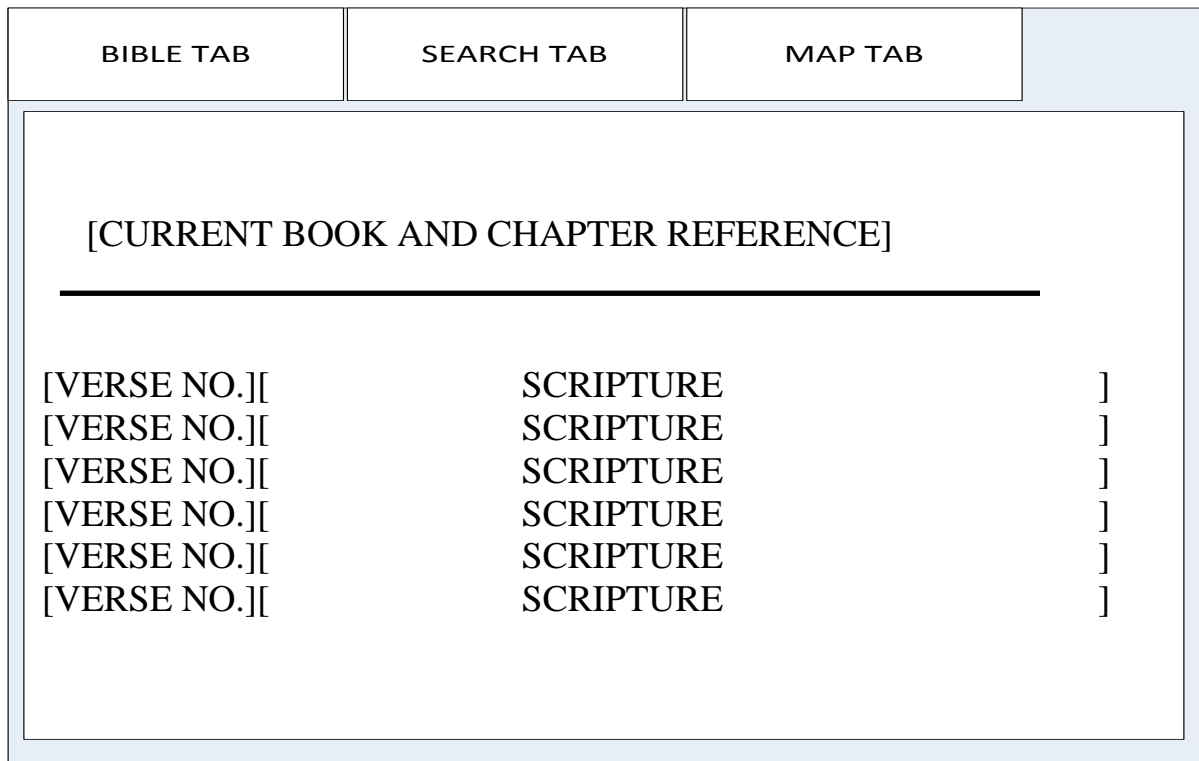
BIBLE TAB	SEARCH TAB	MAP TAB

[CURRENT BOOK AND CHAPTER REFERENCE]

[VERSE NO.][SCRIPTURE   ]
[VERSE NO.][SCRIPTURE   ]
[VERSE NO.][SCRIPTURE   ]
[VERSE NO.][SCRIPTURE   ]
[VERSE NO.][SCRIPTURE   ]
[VERSE NO.][SCRIPTURE   ]

Figure 3: An Image of the Interface of the Bible Reader Subsystem.

The B3 application will be aimed at providing mobile device users a portable Bible application which assists the users in increasing their knowledge of the Bible. This application will be deployable to users of the mobile devices that run on the Apple iOS, Google Android, HP webOS, Microsoft Windows Phone, Nokia Symbian OS, Badaor RIM BlackBerry operating system. It will be designed using web technologies such as HTML5, Javascript and XML, which will allow the application to function on all HTML5 enabled mobile devices. The applications will be modularised into three subsystem: Bible Reader, Search and Map Viewer Subsystems.

The Bible Reader Subsystem contains all the functions that pertains to the activity of the user opening and reading the books and chapters of the Bible. The Search Subsystem allows the user to search the Bible for any scripture based on the key phrase and displays all the results. The Search Subsystem has types of classes as follows: Boundary Classes such as Search Interface, Control Classes such as Search Controller, and Entity Classes such as Bible, Book, Chapter, Verse. The class diagram for the search subsystem is shown in Figure 4.
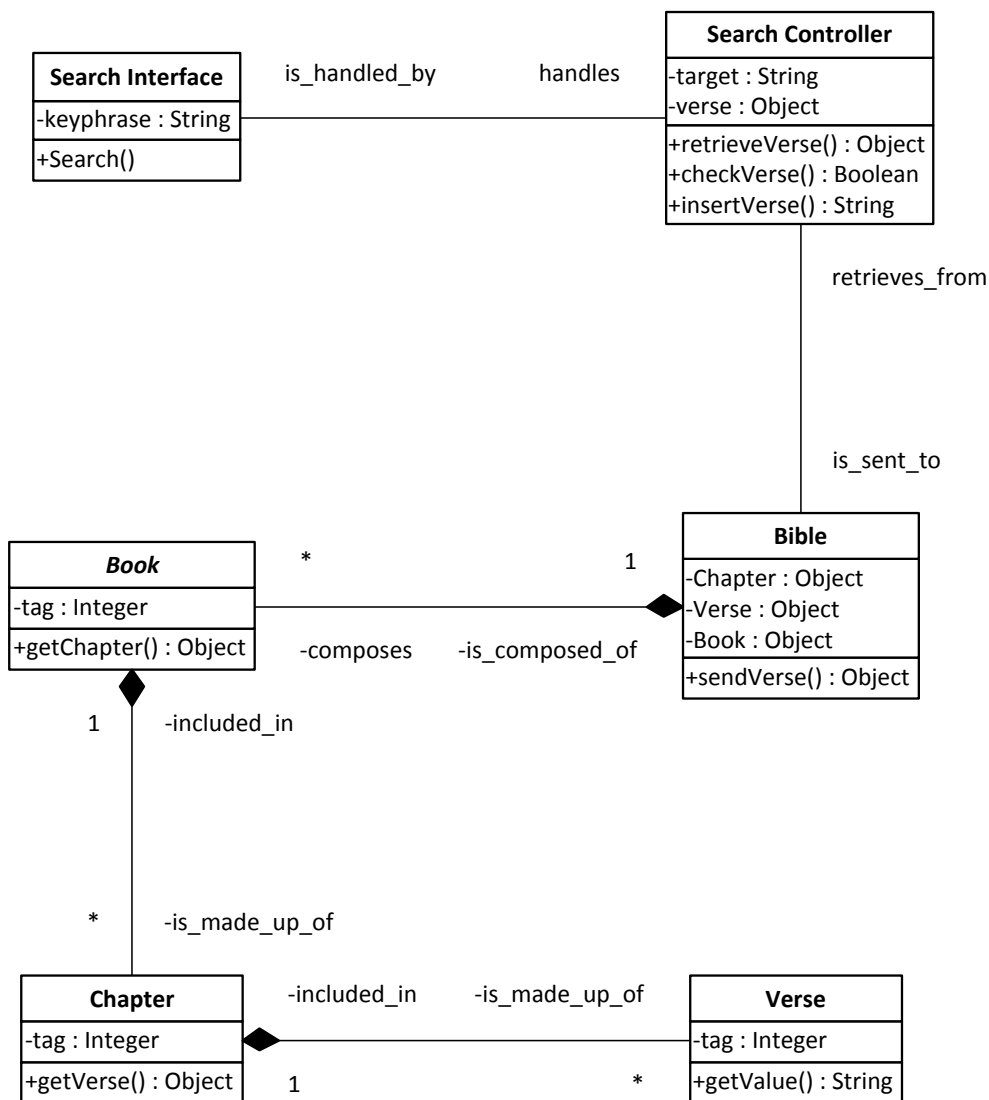
Figure 4: Class Diagram for the Search Subsystem

SYSTEMS IMPLEMENTATION

This section describes the various modules that comprise the Mobile Bible application:

Bible Page: The Bible tab is the webpage which allows users of the system to open a specific chapter or book in the Bible and view its contents. This webpage represents the Bible Reader Subsystem of the application. It features a four button to go to the next and previous book or chapters respectively and an input box for a direct input of the desired book and chapter. An image of the Bible Tab in the Ripple Emulator is contained in Figure 5.
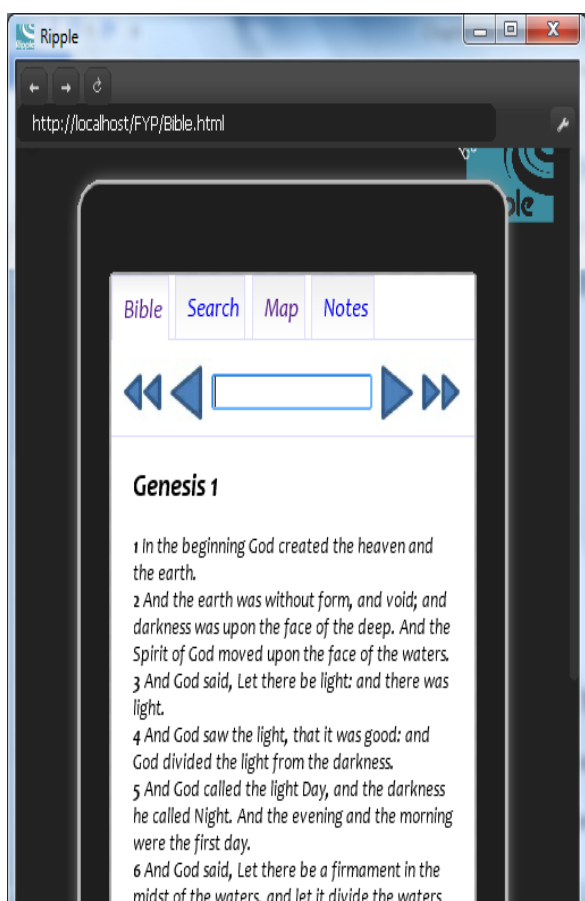

Figure 5. An image of the Bible Tab in the Ripple Emulator

BENEFITS OF THE SYSTEM

This research demonstrated some of the advantages of HTML5 over Native Applications in terms of Mobile Web Application Development:

Native Applications are costly to develop across several platforms but, with the advent of the cross platform support of HTML5-based mobile web applications, developers can now focus their time and money on the core innovativeness of the application instead of the excessive overhead. The study will enable user of the application to either cultivate a reading culture in terms of their Word Study, if they don't have one already, or improve their current reading culture so as to improve the rate at which they learn about the Word.
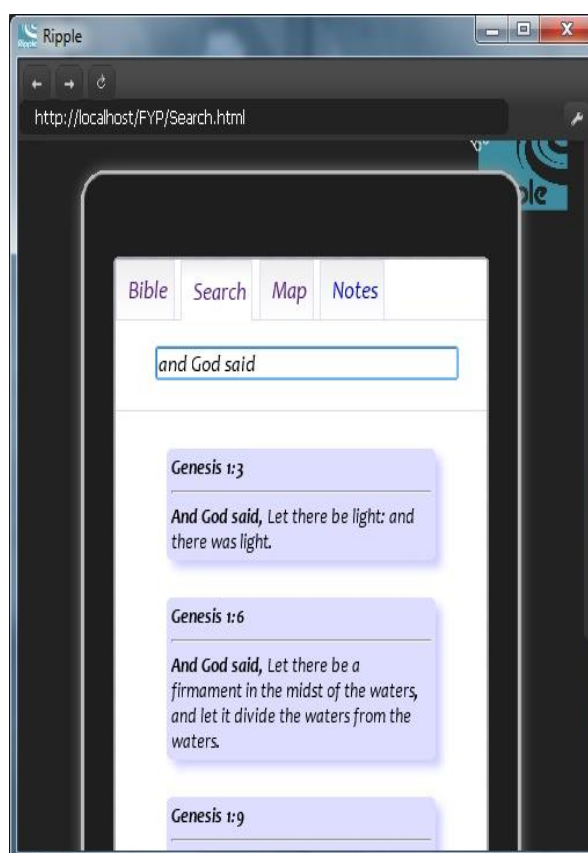

Figure 6: An image of the Search Tab in the Ripple Emulator

This study also enable the users of the application to access their Bible study notes anywhere and at any time. This will help them to remember the knowledge that they have gained in their Word Study.

The scope of the B3 application is that the Bible translations is limited to King James Version. There are several versions of the Bible such as the Amplified Version (AMP), Contemporary English Version (CEV), and King James Version (KJV). Due to the fact that adding multiple versions may make the project to exceed its completion date, only the King James Version of the Bible will be available for the initial release of the software. Similarly, commentaries and dictionaries will not be included in the first version of this software. However, subsequent versions may contain these two resources.

CONCLUSION

The B3 Mobile Bible application is designed to help Christians and non-Christians alike to gain a better understanding of the Bible through a constant study of the same. This system can be used to read, search and make notes of the Bible as well as view biblical locations that exist. It is a cross-platform mobile application that is designed to be deployed on mobile devices in order to provide simple and easy access to the Bible. It is an intermediary between mankind and the Bible.

The B3 Mobile Bible application is flexible in its accessibility and dynamic in its portability: It offers a platform from which the Bible can be accessed at anytime, anywhere so long as the user has his or her mobile device with them. It provides an alternative to traditional printed Bibles as a medium for reading the Bible by offering a portable solution in mobile computing. Users of this system will be granted the opportunity to leave their Bibles at home and access the wealth of knowledge which the Bible contains, anywhere they are.

REFERENCES

1. About Go Bible. (n.d.). Retrieved May 6, 2012, from Go Bible: gobible.jolon.org/about.html

2. Griffitts, T.A. (n.d.). QPSword - The Qtopia SWORD Reader. Retrieved May 6, 2012, from The Crosswire Bible Society: http://www.crosswire.org/qpsword/

3. JISC. 2009. "Sword Project Final Report: Simple Web-service Offering Repository Deposit Phase 2". Retrieved 2nd June 2013 from http://www.jisc.ac.uk/media/documents/programmes/reppres/sword2finalreport.pdf

4. Paul, R. 2009. http://arstechnica.com/open-source/news/2008/09/nokia-launches-linux-based-qt-extended-mobile-platform.ars. Retrieved May 6, 2012, from Ars Technica:

5. PC Magazine Encyclopedia. (n.d.). Native Application. Retrieved March 8, 2012, from PC Magazine Encyclopedia: http://www.pcmag.com/encyclopedia_term/0,2542,t=native+application&i=47651,00.asp

6. QPSwordontheZaurus. 2002. Retrieved May 6, 2012, from On The Web: http://www.otweb.com/phramework/pw/module/blog/?id=220&t=QPSword_on_the_Zaurus

7. Shankland, S. 2011. "HTML5 spec set for 2014 completion". Retrieved May 6, 2012, from CNet: news.cnet.com/8301-30685_3-20031673-264.html

8. Wright, A. (n.d.). Palm Bible+. Retrieved May 6, 2012, from Sourceforge.net: http://palmbibleplus.sourceforge.net/*

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