

Survey on Techniques for Cross Platform Mobile Application Development

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Abstract— Smart phone is used by most of the population. Over thousands of applications are used daily and a new application gets launched as per need. In order to do work on phones itself many desktop applications are getting converted to mobile version by developers. And it's real challenge to market are these applications and reach to the maximum users. From developer point of view for application to reach to most of the end users it need to run on max platforms, this needs redevelopment of application, we can solve this problem to some extent by developing cross platform application without additional investment. Several techniques are available which will help to make it happen. Survey of these techniques could help application developers to make a proper choice.

Index Terms— Cross Compiled Approach, Cross Platform Application, Cross Platform Application Development Tools, Hybrid approach, Interpreted Approach, Web Approach.

I. INTRODUCTION

Now Mobile communication is being used by nearly half of the people all over world. In last four years a billion of subscribers got added making total mobile subscriber count as 3.2 billion. After observing huge growth rate of subscriber and product invention, we can make a statement that this growth will cross 4 billion adding approximate 700 million subscribers up to 2017 [1]. Earlier Phones were capable of just basic functionalities like call and sms; however, there were some which are shipped with browser providing some advance features [2]. Along with this Smartphone advancement some major industries entered in mobile market to make their prominent identity in mobile application development. In past few years Google's 'Android', Apple's 'iOS', Microsoft's 'Windows Phone 8' and BlackBerry's 'BlackBerry 10', Symbian are found to be leading market holders.

According to IDC which is Worldwide Quarterly mobile Phone Tracker, Android has captured top position in market shares followed by iOS at second and Windows Phone third; and also they are going to be major mobile Operating System players up to 2017 [3]. This, paper will be more focused on technologies applicable to them.

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Different internal architecture of Operating System becomes a reason for redevelopment of application to make it run on each Operating System which in turn incurs lot of cost in terms of time, money, efforts. Consider example of document editor software like Adobe Reader and Kingsoft office. People are also doing work through their Smartphone too. It's not necessary that everyone is using windows operating system on their Smartphone. Each mobile operating system uses different programming model, developer would require additional overhead and troubleshooting since developer might have good hands on particular single platform. Hence, making software as cross platform application can be a good option.

This paper will give an idea about techniques which are used in platform independent application development. Section II explains the approaches used for cross platform development and section III and IV gives tools available for cross platform application development and comparison among them respectively.

II. APPROACHES TO BUILD CROSS PLATFORM APPLICATIONS

An application can be made cross platform using different methodologies. Some methodologies concentrate on the application construction phase to achieve this, while some concentrate on the application execution phase. Each methodology has its own purpose and context. Primarily cross platform development approaches can be classified as given below.

In Web Approach, application built is mainly designed to run on web browsers of device and is accessed using URL; thus mobile device doesn't need any installation of application related component. These application uses HTML, CSS, JavaScript for development. Browser based application itself becomes platform independent, thus output of application development using this is platform independent [4].

Though applications developed using web approach have limited access to device data and hardware, but instead data it uses is server driven, there are Many software libraries like Sencha Touch, WebApp.net, JQuery Mobile, JQTouch. provide functionalities that could be used to simulate these applications with device features [4][5].

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III. TOOLS AVAILABLE FOR CROSS PLATFORM APPLICATION DEVELOPMENT

Cross platform applications means developing single application or writing single source code and get it executed on different platforms. While development of mobile application developer checks for technique which will be best to save money, avoid learning new languages and make application fit for maximum devices. Due to different software architecture and varying device hardware capability it's a challenge to deploy single code base application on multiple platforms.

Cross platform development tools gives a solution. There are number of tools available for cross platform development for example, Rhodes, Titanium, PhoneGap, Xamarin, MoSync, IBM Worklight, Corona, Marmalade, Adobe Air, Dragonard.

A. Appcelerator's Titanium

Titanium is an open source cross platform application development framework introduced by Appcelerator in December 2008 approved through license of Apache 2. Framework provides an integrated environment to build wide range of mobile applications and also some cloud services which can be used by backend of application. It supports model view controller model.

Titanium can be used independently or in combination with other tool like phoneGap. Application development using Titanium SDK and an integrated development environment is free of cost but for additional cost need to be paid for analytical capabilities and cloud services [6].

Appcelerator Titanium comes with Alloy framework where user interfaces is designed using XML and CSS. Alloy has added Titanium style Sheet abbreviated as TSS which works similar to CSS to apply styles to application. The *application_name.tss* file contains complete styling information for project maintaining consistency across views in complete application.

B. Corona SDK

Cross-browser applications, games, and e-books can be created using a mobile development platform known as Corona SDK, which provides faster application development than traditional way. It uses a scripting language called as Lua. It is possible to incorporate Game Center, sprite sheets, social media into application [7]. Corona SDK offers a free structure called Starter and paid one known as Pro for building and publishing application on android, kindle, iOS and Nook. If developer make use of Starter, some features will be unavailable unless application gets upgraded to paid product pro, as pro allows us to download latest builds gets added by Corona Labs [7].

It has Corona SDK Simulator in which developer need not to use it to write code but instead it itself take code developer write using any editor and converts code into visual display of graphics and sound or converts code to the file types required by Apple, Amazon, Barnes and Google for hosting application on their app stores. A PC user can make use of Notepad and Mac user can use TextEdit to write code. There are some other options available for writing code like TextWrangler, Notepad++, TextMate, and Sublime Text. Corona SDK doesn't care about the text editor get used, it just need file to be saved with correct file type.

C. Adobe AIR

Adobe AIR framework can be called as multi-screen, multi-operating system runtime, can be used by developer with good web development skills for building a rich internet Application(RIA) for desktop as well as mobile devices. Adobe AIR uses HTML, JavaScript and Ajax for application building. You can make use of any of the technology among Flash, Flex, HTML, JavaScript, and Ajax as per your experience for example, application can be build using single or combination of Flash / Flex / ActionScript or HTML / JavaScript / CSS / Ajax. User interaction to Adobe AIR is exactly same as that with native applications, application runtime is installed at one time and it can be used as native application. Extension of web-based applications to the desktop is possible without need to learn traditional desktop development technologies or the complexity of native code[8].

Adobe AIR can build application for Windows and Mac OS desktops as well as iPhone, iPad, Kindle Fire, Nook Tablet, and other Android™ devices [9].

D. Qt

Qt, a cross platform development framework provides a Integrated Development Environment (IDE) called Qt Creator for building application and user interface for desktop and mobile. It provides support for iOS and Android among mobile operating systems and also desktop operating systems like Linux, OS X and windows.

With Qt reuse of code is possible. Qt Creator provides tools for application design and development with the Qt application framework. Tools provided by Qt Creator helps in accomplishing all task during application development life cycle that is from creation to deployment of application on targeted platform. Qt provides two different integrated visual editors for intuitive, modern-looking, fluid user interfaces and for a traditional user interface that is clearly structured and enforces a platform look and feel known as Qt Quick and Qt Designer respectively [10].

E. Sencha Touch

Sencha Touch is HTML5 mobile application framework. One can experience native application like experience in hybrid shell or inside a browser. First version of Sencha Touch known as beta i.e version 0.90 was launched on 17th july, 2010 supporting Android and iOS. Later versions comes with additional features like support for iOS7, Apache Cordova, TouchGrid, XHR2 in Sencha Touch 2.3.0. Sencha Touch 2.3.0. also improves BlackBerry features for example, Swipe screen edge to reveal menu, Change title location - left (default), center, right, Dual navigation bars, Peeking - menu portion visible at edge of screen, Minimize menu to reveal only the icons, Icon-only menu items, New menu button, Toggle field change, Theming change [11].

Sencha Touch works on mobile devices WebKit based browsers in iOS, Android and tablets. Also Sencha Touch works on desktop WebKit browser like Safari and Chrome, but it's not designed for desktop internet applications, instead it's aimed at Mobile applications only.

F. Xamarin

Xamarin introduced with idea of porting single code base across different mobile operating system without loss in quality and performance. Using Xamarin it is possible to develop applications for iOS and Android with C# and .Net libraries. Along with this Xamarin allows developer to use full variety of user interface controls and native APIs of underlying operating system as well as hardware. Xamarin 2.0 officially released on February 2013, has introduced a many new features which simplifies and speed up mobile application development. Those are- a potent new IDE called Xamarin Studio which supports building iOS applications using Microsoft's Visual Studio; and another is Component Store that makes it easy to include third-party libraries and frameworks into application [12].

Xamarin Studio simplifies development by supporting all features required from creation to publication which includes ease in managing project, designing user interface, debugging, compilation, testing, packaging and deployment of project. It clubs basic of general purpose C# programming capabilities, mobile development features and support for Xamarin's frameworks and build toolchain which results in IDE tailored to build application with Xamarin [12]. Xamarin Studio is based in MonoDevelop IDE. MonoDevelop IDE was built with user interface development toolkit used by GNOME desktop environment called Gtk+;and it was introduced to support .NET development with Mono for Linux desktop.

Xamarin also make it possible to use Visual studio for building Android and iOS applications. Visual Studio can offload built process to Mac node which resides on local network for iOS application compilation using Xamarin developed software.

G. IBM Worklight

IBM Worklight is IBM Mobile Foundation Product. IBM Worklight help developer to create, execute and manage native,HTML5 and hybrid applications with industry standard technologies and tools for smartphone and tablets. IBM Worklight's IDE provide features like maximized code reuse, per-device optimization, mobile-optimized middleware and powerful management and analytics. IBM Worklight includes IBM Worklight Studio, IBM Work-light Server, device runtime components and IBM Worklight Console which helps to address high security standards of overall organizations in the world. To provide application provisioning, access authorization, user authentication, encrypted server-client communication and offline availability, including on-device encryption and offline authentication these features are designed [13].

IBM Worklight Studio is an IDE to develop cross platform application. Using IBM Worklight Studio,it is possible to access a device application programming interface (API) using native code or a PhoneGap bridge. The IBM Worklight Server which is mobile optimized middleware, serves as gateway between application's back-end system and cloud based services. Features for example, Connectivity and authentication APIs, offline authentication and remote disabling, Local encryption, Runtime skins, user interface

abstractions and HTML5 compatibility are provided by Device Runtime component.IBM Worklight Console act as administrative Graphical User Interface (GUI) for server, adapters, applications and push services. It does all monitoring, management and controlling work related to server, adapters, applications and push services.

H. Marmalade

Marmalade platform allows developer to develop cross platform applications and games for mobile, desktop and Smart TV, example, iOS, Android, LG Smart TV, Windows Phone 8, Roku, BlackBerry. For using Marmalade on PC Windows 7 or Windows must be installed on PC. If developer wants to use Marmalade C++,he will need any version Microsoft Visual Studio 2008 SP or a newer one installed. And to use Marmalade on Mac Operating System least OS X version 10.7 should be running on device and also Xcode version 4.6 or later is needed.

Desktop projects of Marmalade can be run using Marmalade Simulator which is integrated into the supported IDEs and thus applications can be launched and debugged on desktop straightforwardly from the IDE.

The Marmalade C++ SDK generates a C++ codebase which can be deployed on multiple platforms. Thus use of single codebase saves time of development for OS-specific and device-specific optimizations. And this is achieved by providing an abstraction layer which is used by developer to develop application. An implementation of abstraction layer is provided for each platform which is supported by Marmalade[14]. Marmalade Quick provide an easiest, fastest and most flexible way for creating 2D games and application for desktop, mobile and Smart TV devices. Quick uses Lua programming language for development.

Marmalade Juice is middleware layer of of tools and libraries sitting on top of the Marmalade SDK. It allows recompilation of iOS code for other platforms to avoid rewriting of code separately for different platform. [Web Marmalade allows the creation of hybrid apps, using HTML5, CSS3 and JavaScript, and these applications are packaged as native app installers, which can easily deployed through app stores

I. PhoneGap/ Apache Cordova

Nitobi started a project called PhoneGap. PhoneGap is an application development framework which allows developer to create applications for multiple platforms. This project was further contributed to the Apache Software Foundation and named as Callback and later changed to Cordova.

PhoneGap uses HTML, JavaScript and CSS for application development instead of using device-specific languages like Objective-C or Java. Applications built are distributed through application stores of respective platform. PhoneGap application has access to native features of device which make them to work like native application. PhoneGap uses a single codebase across all platforms it supports avoiding reinventing code for different platform separately. Applications developed are not completely native or completely web based as layout rendering is done via web views not through native UI framework and there's a missing support to several functions of HTML [15].

TABLE I
 TABLE SHOWING CROSS PLATFORM DEVELOPMENT TOOLS AVAILABLE, TECHNOLOGY IT USES AND OTHER DETAILS

Sr. No.	Tools	Programming Language Used	License	Device capability Support	Integrated Development Environment support and build environment	Cross platform development on
1.	Apache Cordova/ PhoneGap	HTML, CSS, JavaScript	Apache 2	Geolocation, Files, Network, Accelerometer, Notifications, Camera, Contacts, Compass, Storage and media	Any SDK can be used just PhoneGap plugins need to be installed.	iPhone, Android, Tizen, Windows Phone, BlackBerry, Symbian, Palm, Bada
2.	Adobe AIR	ActionScript, HTML, CSS, JavaScript	Flash Builder, Flash Professional, IntelliJ IDEA - Commercial licenses available Adobe AIR SDK (command line tool) – Free	-	Flash Builder, Flash Professional, IntelliJ IDEA	iOS (iPhone, iPad, iPod touch), Android, BlackBerry
3.	Sencha Touch	HTML, CSS, JavaScript	GPLv3, Free Commercial License, Paid OEM and Embedded Systems Licenses	-	Sencha Architect 2	iOS (iPhone, iPad, iPod touch), Android, Kindle, BlackBerry, Bada
4.	Qt	C++, QML	Free & commercial licenses available commercial license, GPL v3 and LGPL v2	-	Qt Creator	Symbian platform, Maemo, MeeGo, Linux, Windows, Mac OS X, Android (Technology Preview), iOS (Technology Preview)
5.	MoSync	C, C++, Lua, HTML5, CSS, JavaScript	Free, GPL 2.0, Free Indie Subscription; commercial subscription available	-	Eclipse, Visual Studio 2005 and later, MoBuild w/ text editors	Android, Java ME, Moblin, iOS (iPhone), Smartphone 2003, Symbian, Windows Mobile (Pocket PC), Blackberry (experimental)
6.	Rhodes	Ruby with HTML interface features compiled through an interpreter into native applications.	Rhodes is free and open source under the MIT License, RhoSync is under GPL or commercial, Commercial support available. Subscription for RhoHub	Barcode, Contact, Calendar, GPS, NFC (near field Communication), Screen rotation, Camera, Signature Capture	Xcode or Eclipse, on-demand RhoHub version includes full IDE	supports iOS (incl. 3.0) on iPhone and iPad, Windows Mobile 6.1 Professional, Mobile Windows 6.0 Standard, BlackBerry 4.6, 4.7, 5.0, 6.0 (BlackBerry 4.2 and 4.5 supported but database access is very slow on these

						devices), Symbian and Android 1.6 and higher
7.	Xamarin	C#	Open Source licence-LGPLv2 license	-	Xamarin Studio or Visual Studio	iOS, Android and Windows
8.	Marmalade	C++, Lua, HTML or Objective-C	Marmalade uses various components which uses GNU General Public License	-	Marmalade SDK, Microsoft Visual Studio 2008SP/2010/2012 Express/2013 Express/Pro editions‡(C++), Scons (C++), ZeroBrane Studio (Lua), Xcode 5.0 and above	Android, BlackBerry, iOS, LG Smart TV, Roku, Tizen, Windows Desktop, Windows Phone 8, Windows Store 8, Windows Store 8.1,Mac
9.	Corona SDK	Lua	Free unlimited trial; commercial licenses available for deployment	camera, accelerometer, gps	Xcode	iOS, Android, NOAA Color
10.	IBM Worklight	HTML5, CSS3, JavaScript, and Native SDK Languages w/ Native Worklight API	Developer edition free via Eclipse Marketplace, Commercial License for deployment	-	IBM Worklight Studio (An Eclipse-based IDE)	iOS, BlackBerry 6,7, & 10, Android, Windows Phone 7.5 & 8, Windows 8 Desktop and Tablets, Adobe AIR, Mobile Web App, Desktop Browser Web Page
11.	Titanium Appcelerator	JavaScript, HTML, CSS, AJAX, jQuery	Open Sourced Apache 2.0 licensed, commercial and enterprise licenses available	Vibration, Geolocation & Mapping, Accelerometer, Sound, Photo Gallery, Orientation, Camera, Screenshot, Shake, Record Video Proximity Events, Push Notifications	Titanium Studio based on Eclipse, Titanium SDK	Android, iPhone; BlackBerry, Tizen, mobile web
12.	DragonRad	D and D	GPL2	Maps, Location based service, Calendar, Camera, Native Device keys, Contacts and payments	Own IDE	iPhone, Windows Mobile BlackBerry, Android, Linux, Mac and Windows

J. MoSync

MoSync is open source cross platform application development framework for mobile devices. MoSync SDK is Eclipse-based IDE having tools to build native application using C/C++ and HTML5, JavaScript while MoSync Reload

only uses HTML5/JavaScript for this. Programs written using Reload run in Reload Client Application [16].

Reload lets developer use HTML5 and JavaScript on desktop machine for application development and right away see result on other devices or emulator. It can be compared to web browser's reload feature, but in this case it is for native mobile application [16]. Native device features like camera,

file system and sensors can be accessed and using real native UI components user interfaces can be created. Once application is fully developed it can use MoSync SDK which takes a project as it is and build a standalone application which is further distributed through app stores.

K. RhoMobile

RhoMobile is an application container which completely behaves as native application but gives a facility to write cross platform code with the help of common web skills. It supports web programming languages which include JavaScript, HTML, CSS and ruby. Access to device, system and framework is provided by RhoMobile through Rhodes and RhoElement API libraries. RhoConnect Client is special integrated component of RhoMobile application providing data synchronization. API library set called Rhodes (free and open source) is accessible to all RhoMobile applications. It provide this access through JavaScript and Ruby interface and also allows access to devices native features e.g. camera, geolocation. RhoMobile also has another API library i.e. RhoElement. RhoElement is also accessible to RhoMobile application and is specifically introduced to run on Motorola Solution device. RhoElement provides access via JavaScript and Ruby programming languages in the same way as Rhodes. Modern Web platform Kit to windows Mobile/CE is also provided by RhoElement. RhoConnect is a server application which can be hosted on any system and acts as bridge for enterprise data to be present on both back-end and mobile device. RhoConnect provide facility to connect to more than one data source very easily. These data sources include databases, web services, enterprise resource planning (ERP) systems and enterprise resource planning (ERP) systems [17].

Among all these tools we are considering Phonegap, Mosync, Dragonrad, and Rhodes for comparison.

IV. APPROACHES TO BUILD CROSS PLATFORM APPLICATIONS

To develop application which could run on multiple platforms using single code base there are some tools available. Each tool has its own benefits and limitations. Depending on requirements of application developer one of them can be chosen. Here, the comparison of tools is given which can be helpful for making decision.

A. Working Theory

Phonegap makes use of webview component which allows web application to act as native client application providing communication ability between web and native Application Programming Interface (API). The program to be executed first gets executed on webview and then visits native applications of different platform; making webview a strong browser to visiting various platforms native API [18]. The designing of program UI and control logic is done using HTML and CSS, while code for calling native API is written using JavaScript.

In both cases of Phone gap and Titanium the application developed would be installed on the phones first, and then it will run in the phone's browser. Where, Titanium is also an open-source cross platform development framework developed by Appcelerator.

RhoMobile's Rhodes build a separate Web App Server which would receive user request and handle them as traditional web servers do, which will also be capable of

visiting SDK API of corresponding Smartphone [18]. Its development files can gets executed on virtual as well as real device as they are compiled directly to native executables. Creation of application and it's maintenance for majority of platform is easy as its development is done on single code base only [19]. This framework offers a desktop simulator which makes it possible to interact with it using command line tools or web interface. The application is compiled into either Java bytecode or into Ruby 1.9 bytecode where Java bytecode is executable on BlackBerry and Ruby 1.9 bytecode executable on other platforms.

Mosyn make use of pipe tool for code generation which is custom C++ compiler. Pipe tool is fed with all application source code and Mosync libraries. The pipe tool build, code, analyze, optimize and output C/C++ source code, mosyn bytecode or java bytecode. This is packaged into appropriate runtime [20].

Thus, each tool is using different methodology like phonegap uses webview, Rhodes has build it's own web app server component and MoSync uses pipe tool.

B. Supporting Platform

As the tools we are considering here are cross platform development tools, their support for number of platforms is limited and distinct for each. For example, Phone gap can support iPhone, Android, webOS, Windows mobile, Symbian and BlackBerry; Mac, Linux, Windows. Rhodes allows application development for iPhone, Android, Windows Mobile, and Symbian; Linux, Mac and Windows OS. Creation of application for iOS, Android, RIM, JavaME, Symbian and Windows Phone platforms is possible by using Mosync. While Dragonrad can support iPhone, Windows Mobile BlackBerry, Android, Linux, Mac and Windows.

C. Writing language

PhoneGap applications are created using HTML, CSS and JavaScript. Rhodes make use of Ruby programming language for application development. While developing application using Rhodes, one does not require to get knowledge of native language or SDK of particular platform, web experience is only enough factor. While dragonard make use of D and D language and Mosync use C and C++ for application development which creates a native application as output.

D. Type of Output Generated

Type of output generated by tool is somewhat dependent on the language it makes use of. Same languages are suitable to create web applications and others native applications.

PhoneGap uses web-view for layout rendering and some of HTML function are not supported, thus Phonegap can't be called as "pure native" or "pure web based"; it's a combination making it fall under category of hybrid applications [19]. DragonRad is platform that offers the possibility to produce both type i.e native and web applications.

E. IDE Used

HTML, CSS and JavaScript are not native technologies-these are equal for all platforms and phonegap make use of it thus, approach of phonegap to develop application on different IDE is found to be useful though it doesn't have its own IDE. After developing application on specific IDE, developer just need to perform porting task to

make it run on other IDE, for which phonegap's additional features are supportive [19].

RhoMobile has its own IDE known as RhoStudio, allows application development using HTML and Ruby. Rhode uses RhoStudio. Also Rhode can use any other IDE supporting HTML and Ruby.

Mosync has its own SDK which allows developer to develop all kind of applications. Mosync SDK is powerful tool coupling different components like Device profile databases, compiler, libraries etc. It provides IDE based on Eclipse while DragonRad has its own [19].

F. Open Source Code

There are various licenses available like MIT (under Massachusetts Institute of Technology), GNU General Public License 2 (GPL2) and Commercial, where the first two licenses are free and offer an open-source support while last one-commercial license could be useful for those companies that want to receive the support directly from the manufacturer. Open source license offers development and support for application without any commercial restriction.

PhoneGap and Rhodes are an open-source mobile development framework license given by MIT, while Dragonrad and Mosync are given license by GPL2 and commercial making Dragonrad as open source while Mosync as commercial one.

Thus, PhoneGap and Rhodes are not restricted by external authority while developers using these two tools will not get support from companies like Mosync and Dragonrad will get.

G. Native feature set used

Various tools are provided with code pieces to interact with underlying operating system. Like Phonegap framework has some pieces of native code which does both work of interacting with operating system and passing back information to JavaScript app inside webview container [2]. These pieces of code are termed as native feature set supported. Where, phonegap supports Geolocation, Files, Network, Accelerometer, Notifications, Camera, Contacts, Compass, Storage and media [18].

While Rhodes native features set supported includes Barcode, Contact, Calendar, GPS, NFC (near field Communication), Screen rotation, Camera, Signature Capture. And Dragonrad has Maps, Location based service, Calendar, Camera, Native Device keys, Contacts and payments.

H. Special purpose

Rhodes main aim is to provide portability and productivity for web programming at high level. Dragonrad is focused on database driven enterprise applications, capable of supporting multiple databases. It provides a good synchronization as well as integration of database with native function [19].

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Model View Controller (MVC) is only supported by RhoMobile's Rhodes framework. Views are written using HTML, CSS, and JavaScript. Controllers are used for backend support and written using Ruby. And App generator is used to generate business logic of view and controller.

Interfacing between JavaScript and Native API layer is provided only by Phonegap and JavaScript. These platforms use a native language of mobile Operating System to access to hardware and software resources with the purpose to add basic functionalities to the JavaScript Engine and make it easy to use for the application as traditional library methods [19].

V. CONCLUSION

Thus, various tools and approaches used for cross platform development are summarized. The choice of approach and tool for application development totally depends on requirements of user. Here, we can relate approaches and tools. From complete paper we find phonegap can be used when hybrid application is to be developed. Phonegap application can be developed using any IDE as it supports special plug-in for porting application. Rhodes application development requires just web programming knowledge thus both of these tools saves developer's efforts. Rhodes builds its own web server for receiving and serving request, thus we can say that Rhodes is uses a web approach. MoSync uses a pipe tool capable of handling native language like C/C++; thus MoSync build native application.

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