

# Mobile Compatible Websites for Educational Institutes- An Over View of Existing System and Proposed Model

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*Abstract:* Now a day's for any kind of organizations having a mobile compatible website became a must along with the desktop version. The revolution in mobile technology made smart phone usage compulsory for any individuals, people were giving first preference to smart phone for browsing the net, due to its compact size and portability. The major flow in mobile phone browsing is, websites were designed for desktop computers where as mobile screen size is very small it gives users feel uncomfortable for visit websites, so we need separate User interface. This paper reviews the present trends of educational institutions maintaining mobile version website, their pros and cons and finally we gave a simple proposed model for maintaining mobile version website.

*Index Terms*—Adobe Muse CC, GCM, mobile compatible websites, UID.

## I. INTRODUCTION

The Revolution of smart phone technologies over the last decade drive the people to use smart mobile as a common thing to carry along with them to do many tasks. In the entire world out of five people three are using smart phones. This is all because of the functionalities and futures provided by smart phone. All most all the functionalities done by a computer is now able to do with a small compact smart phone device. People were preferring smart phone devices as first priority over a computer for browsing internet. The limitations between a computer and a smart phone device is the screen size and battery for power supply.

Figure 1 describes the sales of internet devices market sales across the globe.

The remaining part of the paper was organized as: Section II give brief description on literature survey on existing trends in mobile compatible websites. Section III gives the detailed information about pros and cons of existing trends. Section IV proposed model for mobile websites. Section V describes the conclusion and future work.

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## II. LITERATURE SURVEY

We have observed present trend in educational institutes maintaining mobile version website. We will discuss all the factors that matters for mobile compatible website, which we have summarized from previous researches work in this area.

### A. Smart Phones

A Smart Phone is a mobile computing device and supports almost all functionalities that a computer performs. It has the following features.

**1. Portable:** Smart Phone was a portable device, which means one can carry or take it with them anywhere. Due to its small size and weight it is easy to carry.

**2. Personal:** In the entire world almost all people have their own smart phone. This is a personal to individuals. There is no kind of multiple people sharing like in work environment.

**3. Easy to use:** Generally smart phones are hand palm size, they are less than 250grams and below one inch. Display varies from 2 to 6 inches. The use was very easy compared to a desktop computer system.

**4. Network connection:** Every smart phone has the ability to connect to the internet so that all the browsing/Goggling can be done with this small device. There are two ways to connect the internet one is from Wi-Fi and the other is through telecom network which is used for phone call purpose. In the Wi-Fi mode we can connect to network with a high speed through roughter are through shared public networks available at public places like airports, railway stations and bus stops etc..., In the telecom network mode we need to pay as per the plans provided by network provider for 2G , 3G or 4G plans.

### B. Mobile Websites Era

The very first mobile web was started in less than 15 years back, and then started tremendous revolution in smart phone era. Due to its portability, convenience, easy to use, and small size it became necessity item in human day to day life. Following will describe the detailed description about mobile web

**WAP:** WAP stands for “Wireless Application Protocol” basically it works at application layer of the smart phone networks. This became a standard for smart phone web for any communication through internet via mobile. WAP describes the way how communication will be done through the mobile internet.

WAP was initially came to existence in 1998, those days no one aware of the WAP standard, in 2002 it came up with new

features and functions as a standard for smart phone web. From there onwards it became a standard for mobile web. At its initial release the charges for internet usage through mobile browser was very high and there is only black and white screen for chatting, this is completely works on voice call over internet through mobile web. Due to heavy usage charges and poor user interface it was failed. After few years it came with good user interface and minimal charge for web browsing. People became aware of how using it even though they are illiterate.

### *C. Architecture and Design Challenges*

The architecture and design of a smart phone compatible websites plays a major role in the usage and efficiency of any website. Special care was taken while designing the mobile sites, architecture of the site will decide how much the site was easy and simple interaction for the users. The design of any mobile website will be created such a way that it is convenient and easy for a novice user. If the architecture is difficult then design will also become complex, so the popularity and usage of any mobile website depends on this two elements.

## III. PROS AND CONS OF EXISTING SYSTEMS

There are various number of operating systems for mobile phone, among them some of the operating systems got popular. The main problem in mobile applications is the compatible issues with different operating systems, because some of the hardware and architecture design were independent like IOS, the applications or the websites compatibility issues must be addressed. We have proposed a model to address all these limitations.

### *A. Major Types of Operating Systems*

There are number of operating systems were used for smart phones [2,5] based on the company it is designing and releasing in the market. But out of all, four types are become popular in the market are given in detail below:

**ANDROID:** It is the first touch phone operating system mostly used across the globe. It primary invented by “Andy Rubin along with rich Miner at Palo Alto California in 2003”. Later In 2005 Google acquired this company for \$50 millions. In Android user interface was based on direct manipulation, mainly used for touch screen by swiping touching or pinching the object in the screen to perform actions. In world wide it is the most used operating system in smart phones. Major part of the smart phone OS market was occupied by Android only. Every year Google releasing new versions of ANDROID for upgrade.

Android OS boot to the home screen, the first navigation and information "hub" on Android devices are same as the computer system. Android is also running on general desktop computers. Android home screens are generally made by application icons and app-widgets. Application icons launches the related applications, whereas app-widgets displays live, automatically updates contents, such as the weather forecast, the user's e-mail inbox, or a directly on the home screen. The home screen was made of number of pages, along with which the users can swipes back and forth, even Android home screen user interface design was largely customized ,thus allows users to adjust the looking and

feeling of the device to individual choices. Wide range of applications were available in Google Play store, which will offers the users with a large number of functionalities and apps. Different types of widgets and sensors gave power to ANDROID. Apps like flip kart, Amazon made shopping on fingertips. Now a day's everything is available in small app.

**IOS:** It an APPLE company operating system for iPhone. It is specially invented and designed only for “Apple hardware” that means we can install it in IOS company hardware only, none of the other hardware can't support IOS. It is used for plenty of its organizations smart phone devices, which includes iPhone, iPad, and IPod. It was the second largest famous smart phone OS in the world. First was Android second place is IOS. From 2013 IOS products like IPod, iPad, and Tablets became popular after the android. IOS was invented in 2007 by Steve jobs also founder of Apple company located at los angles US.

User Interface in IOS is designed based on direct manipulation targeting mainly touch phone. Users can feel easy and convenient while operating the mobile, by touching with finger, swiping pinching user can select objects in the display to perform any actions. To install any app we have to download it from apple play store with a minimal charges, we cannot install apps from any other sources.

**WINDOWS:** Windows Phone or WP was a smart phone mobile operating system designed and implemented by Microsoft. Primarily released as a replacement for “Windows Mobile and Zune”. Windows Phone support a new user interface design derived from the Metro design language. The very first launch of windows was on October 2010 it is named as Windows Phone 7, after some days it upgraded OS and released as Windows Phone 8.1 it was the final release till 2015. At the end of 2015 it came up with a new version called windows 10. This is a third largest smart phone OS across the globe. User interface design in Windows Phone was developed based on Microsoft's "Metro" design language, and also inspired by the user interface design in the Zune HD. home screen, also called as "Start screen", was designed with the help of "Live Tiles", which are the inspiration for Windows 8 live tiles. Tiles were the direct- links for any application, feature, and functions and also for individual items like phone contacts, website pages, applications or media objects. Users can able to add, rearranging, and/ or remove tiles according to their wish for better looking. Tiles are the dynamic In nature but updated in real time – for example, tile for e-mail accounts could displays the number of unread messages, the tile would displays a live updates in present weather.

**BLACKBERRY:** BlackBerry Operating System was a proprietary smart phone operating system invented and designed by BlackBerry Ltd only for its BlackBerry hardware supported smart phones. It does not support any other hardware like IOS, it's hard ware is completely different from other smart phone architectures. BlackBerry came to the market early in 1999, but initially it provided OS for basic mobiles only, later in 2002 it came up with a smart phone OS and became popular by its functionality. The only thing is it only support their hardware architecture, and it won't support any other hardware. This is the third popular smart phone OS in the world before windows came to the market but after

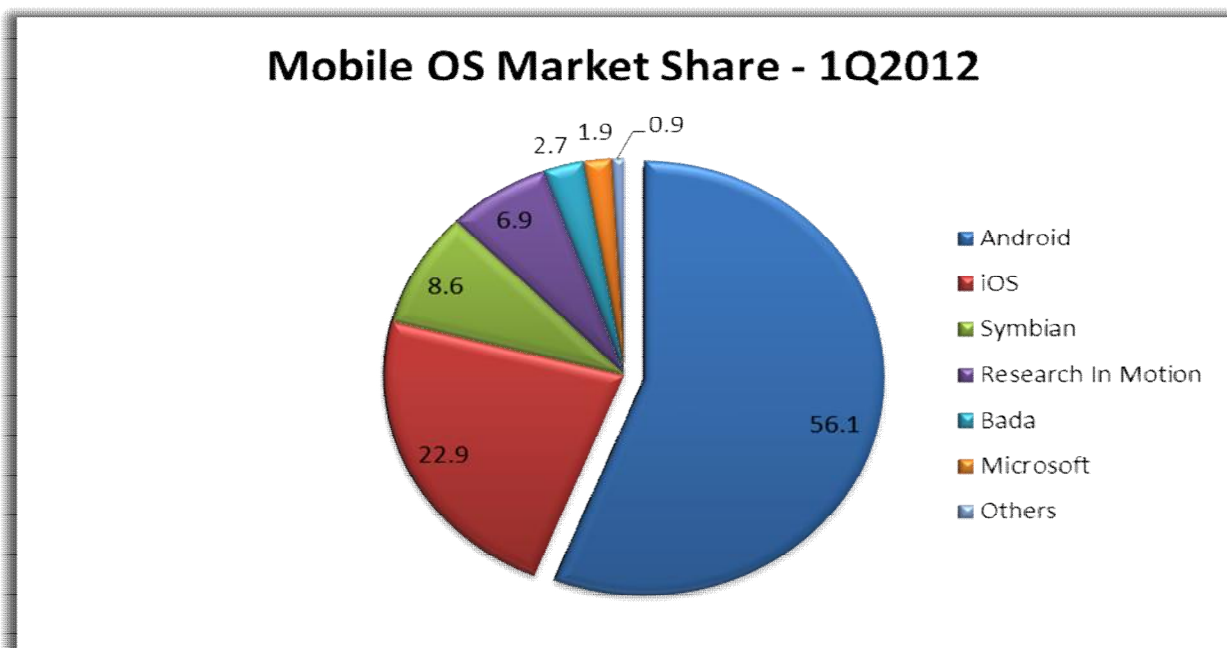


Figure 1: Smart phone market OS share

windows came to market it drops to fourth position in the market.

User Interface Design in BlackBerry supports graphical user interface due to its ability to have multiple tasking we can perform multiple works background as well as foreground. It has the advantage of video calling to its brand mobiles only, so that blackberry users can call them self, but they can't call any other mobiles of different brands like IOS, Windows, Android etc..

**SYMBIAN:** Symbian Operating System is a descendant to the Psion's EPOC, and runs only on ARM processors, even though an unreleased x86 port exists. Symbian was the primary choice for many top brand smart phones, such as Motorola, Samsung, Sony Ericsson, and the last but not least Nokia. Nokia became top most brand mobile in India due to its user interface design and the hardware simplicity.

User Interface Design in BlackBerry was initially designed by focusing novice and illiterate people in India, and became succeeded worldwide. Due to its simple user interface design and the different new functionalities it was the first top brand in India before smart phones revolution came. Microsoft entered after observing the future in smart phone and acquired Nokia to release Microsoft windows phone.

#### IV. PROPOSED MODEL

To address the compatible issues we are using one of the emerging tool called Adobe Muse CC which is used to design mobile compatible websites. And also we are using GCM for delivering push notifications to the users so that they will get information regarding any update made to the website.

**Adobe Muse CC:** It is a tool for designing all kinds of websites, it was originally developed by ADOBE SYSTEMS, and this is a free tool for first few months for designing any number of websites. It will give basic support for designing any websites which was simple to navigate and easy to use

and maintain. Due its ability of having a lot of widgets library we can be able to design a good looking websites with some effects which will attract the new users. It supports both mobile as well as desktop websites.

The main advantage of using this tool is, it support all types of mobile operating systems compatibility. Since there are variety of operating systems for smart phones like ANDROID, IOS, BLACKBERRY etc., adobe muse cc tool support the website compatible for any OS in smart phones.

The second advantage of this tool is that no need to write much code for functionalities. Adobe muse cc has a number of special features and a lot of widgets to support design the website in a new style as well as

efficient than any other sites. It also supports creative responsive websites, we can add animated effects, fade in fade out effects and also scroll effects. It also supports thousands of web fonts. having responsive website designing in Adobe Muse, we able to create and use a single Muse file to create different looking for different browsers width and height. The pages were fluid, which means, they scale in proportion ratio to the browser width and that of proportional height. So that we don't have to create and maintain separate pages for mobiles, tablets, and desktops. We can create unique, responsive websites for different screen sizes without complex coding in html. Adobe Muse provides a blank canvas without restrictive templates or grids for designing responsive websites, which means request and reply between client side web pages.

**GCM:** GCM means "Google Cloud Messaging" it was developed and implemented by Google. It provides the app developers to send push notifications to the smart phone users through its cloud servers. It is a no pay service up to some limited time period after onwards with minimal service charges. To enable GCM service for any mobile app they have to register to the GCM

server through their mail ID in google console by creating one ID. The process is as follows below.

**Step-1:** Initially developer or designer has to create an account in Google's console with their mail ID.

**Step-2:** GCM will assign the developer with one of their cloud servers ID which will acts as a main server for sending push notifications to smart mobile users from the web site server.

**Step-3:** Every app has some unique ID, this ID is send to the GCM server so that "Google Cloud Server" can identify the smart phones which is having the same app ID to send push notifications.

**Step-4:** Every user who will install APK ( Application Package Kit) file of our app has to register their details to have push notifications from GCM.

**Step-5:** GCM Sever will maintain a database about all users who installed this APK file.

**Step-6:** If any updates done to server then immediately GCM server will send the push notifications to all the users who installed this application APK file only when they are in online.

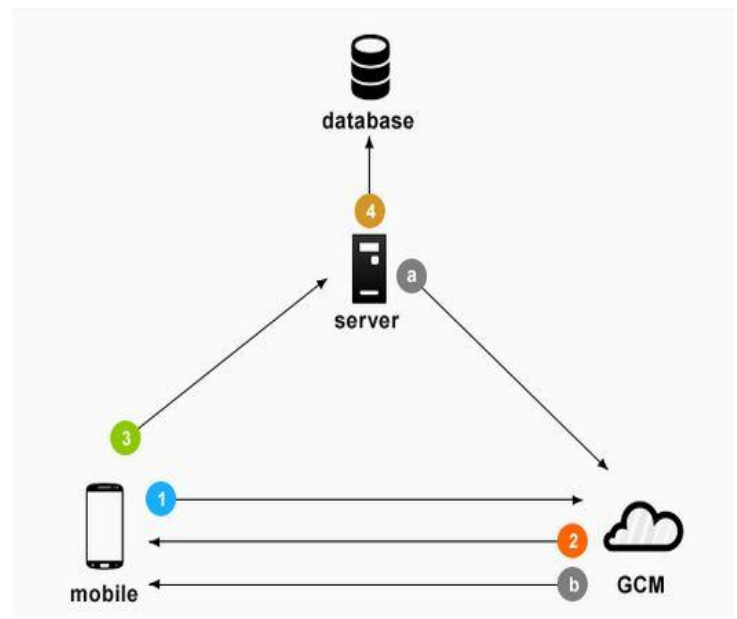
**Step-7:** If any one of the users are in offline then the GCM server will maintain a queue for those users who are in offline so that whenever they came to online it will automatically resend the push notifications to all those offline users.

**Step-8:** Until and unless server crashes the push notifications will be delivered to the subscribers at any cost so that it guarantees the delivery of information in the form of push notifications.

### V. CONCLUSION AND FUTURE WORK

We have implemented the simple prototype model for mobile compatible website, while implementing the website, we have taken care of compatible issues of different OS types. For Novice users it is easy to operate, even experience users will feel simple to use this model. All the institutions were maintaining separate websites for desktop as well as for smart phone users, according to one survey the future generation will depend on smart phones for almost all work that can be done with a desktop computer. The main motive of our model is compatible with all mobile OS and users will get the push notifications about all the updates regarding counseling dates, admissions, exams, workshops dates etc,. So they need not to go through the website for getting any new information.

We have implemented one way communication regarding website updates to the users, as an improvement to this paper, We can add two way communication between students and professors regarding class work, doubt clarification or even assignments can be given to individual students. It will going to be a revolution in coming days to have such kind of mobile website with two way communications. Till date all are just static website so we can develop this app further to provide more functionalities.



1. First android device sends **sender id, application id** to GCM server for registration.
2. Upon successful registration GCM server issues **registration id** to android device.
3. After receiving registration id, device will send **registration id** to our server
4. Our server will store **registration id** in the **database** for later usage

- a) Whenever push notification is needed, our server sends a **message** to GCM server along with device **registration id** (which is stored earlier in the database)
- b) GCM server will delivers that message to respected mobile device using device registration id

**Figure 2: GCM work flow**

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