

## Mobile app plosion and its future

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### ABSTRACT

It has not even been a decade after the launch of app stores, and today the mobile app industry is a billion dollar industry and has experienced an unprecedented growth. Apps are one of the catalysts to the increasing sale and use of smartphones globally. Apps have become an important tool for information, entertainment, social networking, buying and selling and much more. By 2016, the number of mobile internet devices in use is expected to cross 10 billion and the mobile applications industry will grow tremendously to meet changing consumer demands and keep abreast of the evolving technologies. The revenues from mobile apps and the number of downloads from various app stores are mounting and has raised curiosity about its future both amongst the users as well as developers. The purpose of the study is exploratory, aimed at studying mobile apps right from their birth to present and predict their future globally. The paper is a comprehensive study of the origin of apps, its development, user trends, the app markets, revenues from apps and limitations of the existing apps to predict their future. The study has been conducted by undertaking an extensive literature review of various articles, magazines, blogs, journals and statistics available over the web.

**Keywords:** Mobile applications, app markets, app stores, mobile app future.

### I. Introduction :

Cell phones have become an integral part of our lives today. The purpose has changed from telephony to utilities, gaming and apps. Apps help us connect and share things with our near

and dear ones, are a source of entertainment, assist us in our day to day tasks, help us locate places, monitor fitness, provide banking services, edit photographs and so on. They cater to specialized needs of every age group and gender. With the increasing number of apps on people's cell phones and the increased time people spend on them, has made 'App' the buzzword. Apps dominate our home screens and have changed our experience with cellphones. Apps have become an important link between the marketers and their customers. App stores are flooded with billions of apps already and hundreds get added every day. The worldwide app revenues are in billions and are rising by 8-10% every year. However not to forget; apps are softwares and are a part of the technological environment that changes dynamically. Also increasing number of smartphone users, drawbacks of multiple apps on cell phones, privacy issues, technological advancements, changing needs of users are creating new avenues for app developers. So what is next with apps? Will apps continue in the current form or there is something else to look forward to? Or mobile apps will simply get replaced?

The paper presents an extensive research on the history and the current state of mobile apps, user trends, app stores, revenues and makes projections about the future of mobile apps analyzing the same. It uses secondary data available from reports, newspaper and journal articles.

### **Concept of mobile applications**

It is a software application developed specifically for use on small, wireless computing devices, such as smartphones and tablets, rather than desktop or laptop computers.

Retrieved Oct 2, 2015 from <http://whatis.techtarget.com/definition/mobile-app>

Christensson, P. (2012) : "App is short for 'application,' which is the same thing as a software program. While an app may refer to a program for any hardware platform, it is most often used to describe programs for mobile devices, such as smartphones and tablets."

Apple popularized the term 'app' after it created 'App Store' a year later, after the release of its first iPhone. Most of the smartphones come with some basic in built apps. Other apps can be installed on cell phones by downloading them from various online app stores. These could be free or might require purchase. Even though, they are cheaper than desktop applications as they require fewer resources to develop, they are less advanced and the features are limited to the capabilities of the mobile operating systems such as iOS or Android.

## History of mobile apps

Mathew Panzarino, co-editor of TechCrunch charts out the following phases of app development:



**Fig 1. Phases of app development by Mathew Panzarino**

### Predictions and origin

At a conference in Aspen in 1983, Steve Jobs predicted a software distribution center where systems could be bought over phone lines. In 1993, the Newton Message Pad, designed and built by Apple contained various in built apps such as web, e-mail, calendar, etc. The year 1997 saw the ‘Snake’ in people’s pockets on their Nokia cellphones. WAP (Wireless Application Protocol) was made available for mobile devices in 1999. The first generation iPod, iTunes music store, third party developers creating programmers for the iPhones and the launch of iPhone in 2007, acted as catalysts for the app development movement. Apple announced a 70:30 deal with developers and themselves for creating native apps for the iPhone.

### The ‘information appliance model’

2008 sees the launch of App Store and about 10 million downloads within a week and 100 million downloads within 60 days of the launch. The ‘Android Market’ launched in 2008, the ‘Blackberry App World’ launched in 2009 also become major distributors of mobile apps and major competitors to iPhone’s App Store. WhatsApp and Angry Birds launched in 2009 topped the download list. The Windows Phone Store, launched in 2010 becomes fourth major distributor of mobile apps.

### The ‘home screen’ era

January 2011, ‘App’ was voted the word of the year 2010. During this era, Android Market got renamed as Google Play Store, the Amazon App Store was launched, Angry Birds reached 1 billion downloads, Facebook acquired Instagram and Candy Crush was released for

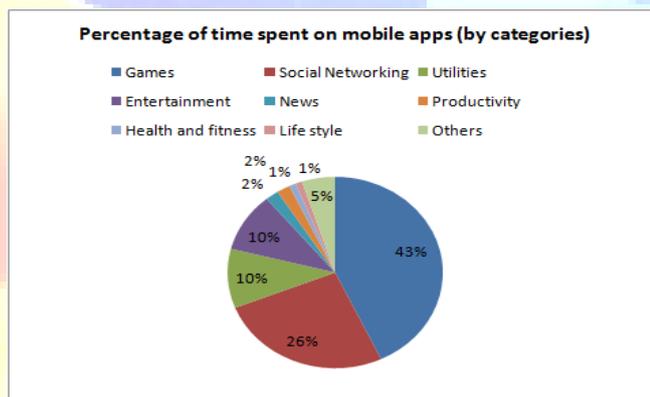
iOS. Zynga Games see a massive decline in its user base and downloads on App Store and Google Play Store see a whopping increase.

**Apps as service layers**

Increasing users switch to smartphones, Facebook acquires WhatsApp, Facebook also releases ‘Facebook messenger’ which sees half a billion users in six months. Google’s Gmail becomes the first standalone app to hit 1 billion downloads. Android Wear, by Google offers a new platform to developers. App store reaches 75 billion downloads. 2014 also sees danger for personal data theft.

**Mobile applications - categories and user trends**

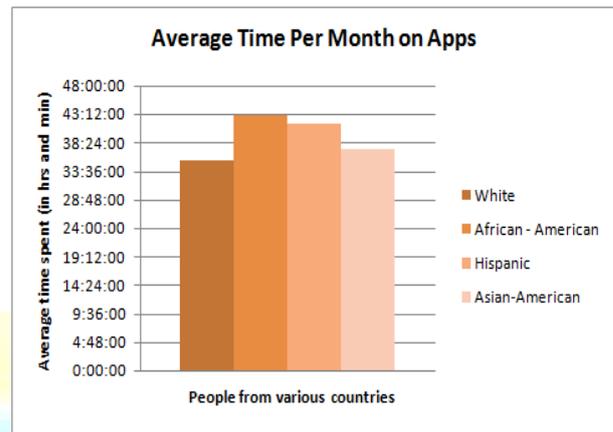
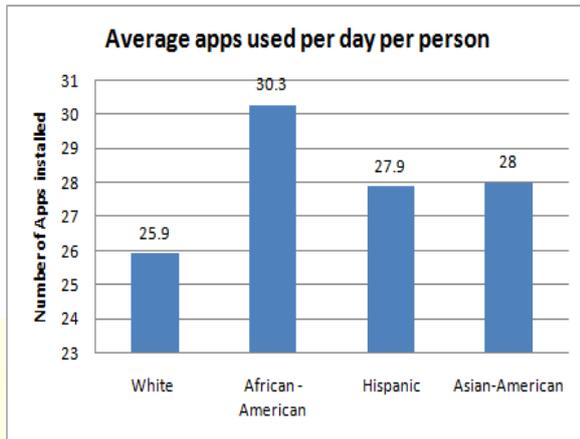
Mobile applications have now transformed from novelty to an integral part of our lives. Majority of the people would agree that their phone is the last thing they see at night and the first thing they see in the morning. Smartphone users spend 89% of their mobile media time using apps. A variety of mobile apps to cater to varied needs of people are available and can generally be categorized into communication, lifestyle, social networking, lifestyle, navigation, entertainment, news and infotainment, banking and finance, travel, food, etc. Music, health and fitness, social networking have become the fastest growing mobile app categories. Fig 1.depicts the time spent by people on various categories of mobile apps.



**Fig 2. Percentage of time spent by users worldwide on various categories of mobile apps**

Source: <http://www.go-globe.com>

It has been found that people use 25-30 apps on their smartphones every day and end up



spending an average of 30-40 hrs. per month using the same.

**Fig 3**

**Fig 4**

Fig 3: Average number of mobile apps used per day per person globally

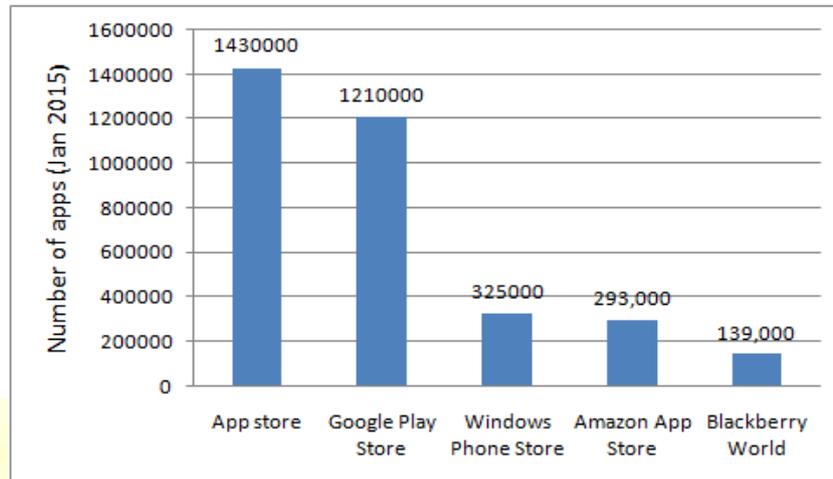
Fig 4: Average time spent by people per month on mobile apps

Source: Neilson, 2015

Most of the app installations are results of searches on various browsers or app stores and some of them are results of mobile app installation campaigns and referrals by family members or friends.

### The app market

Apple launched the App Store in 2008 and others followed the suit. The number of app stores available is humongous. There are Chinese app stores, devices manufacturer's app stores, android app stores and many others. However Apple's App Store and Google Play Store are seen to dominate the market.



**Fig 5 : Number of apps available in the leading app stores as on January 2015**

**Source: dazeinfo.com**

Google Play store managed to offer more number of apps than App Store offered towards the end of 2014; however, the Wall Street Journal reports that as for Q1 2015, in spite of having 70% more app download as compared to App Store, the revenue of Google Play Store was about 70% lower than that of Apple's App Store. The Wall Street Journal report is based on numbers from the App Annie Index: Market Q1 2015.

### **App market and revenues**

The motive behind developing and launching apps is to cultivate customer loyalty, create brand awareness, make new mobile customers and much more. Mobile apps also act as a new distribution channel for the company. However making monetization strategies is important too. It is found that 2% of the app developers claim about 54% of all app revenues. Various revenue models like in-app purchases, gated features, sponsorships, paid apps, subscriptions or a combination of these could be used. The graphs below show the app revenue composition by country and worldwide revenue forecasts for mobile apps.

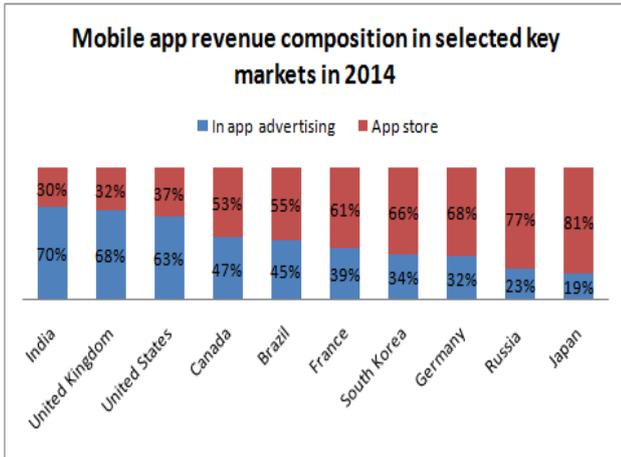


Fig 6

Fig 6: Mobile app revenue composition in selected markets in the year 2014

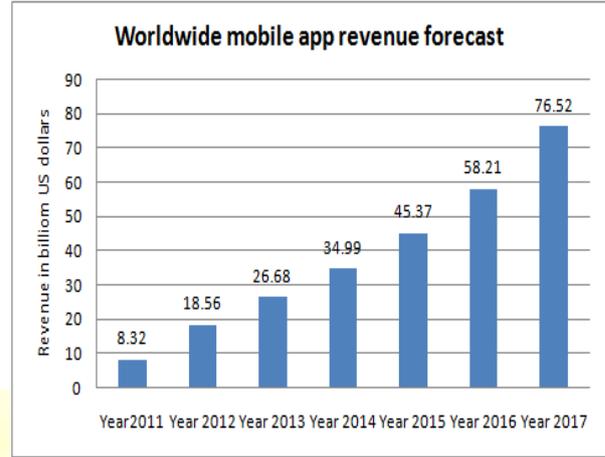


Fig 7

Fig 7: World wide mobile apps revenue forecast

Source: [www.statista.com](http://www.statista.com)

### Challenges paving way for newer versions/ replacements of apps

Existing mobile apps are bound to undergo a transition in the near future for the following reasons:

#### 1. Increasing number of apps

As the user base for mobile apps increase, many businesses are trying to push their application on users mobile. Many have shifted the focus from web to mobile apps, encouraging the user to download apps on the mobile. Though this gives many benefits to the business owners, it also becomes a nightmare for the user. Downloading and managing multiple apps becomes more difficult.

#### 2. Threat to privacy

Installing an app on the device is as good as giving access to the device. During installation, apps ask for permissions to access mobile features like GPS, contact list, and device storage. As mobiles are personal devices, users may have some personal information stored on the device, which can be easily accessed by apps having access to storage. Thus endangering the privacy of the individual.

### 3. Storage and data usage

A smartphone user on an average has 25-30 apps installed on his phone. This eats up on the storage space of the phone making it slower. If the user falls short of memory, he might have to uninstall some apps, so that new apps can be installed on the device. Also some apps are always active in the background, affecting the overall performance of the device and they also utilize the bandwidth and increase data usage.

### 4. Changing consumer needs.

With the changing lifestyle patterns, increasing income levels, time crunch, the needs of consumers are changing and they prefer what is latest, time saving, easy to access and affordable. Apps have to cope with the ever changing consumer demands. Thus, apps to be more effective, powered with latest technology and cater to the increasing needs of customers.

### 5. The need for personalization.

With mobile phones becoming more and more personal, and a necessity that accompanies people for most of the hours during the day, apps installed on phones need to be more personalized for initiating an active approach and contributing in making lives easier, better and healthier for their users.

### 6. Requirement of downloads.

Unlike browsing, if apps are to be used, they first need to be downloaded. This increases the distance between the user and the app. Apps also need regular upgrades to be compatible with the platform updates. Another drawback is that, it is not possible to compare two apps unless both are installed and tested for our purpose. Reviews may be relative and may not be always accurate and may not be useful for our specific needs.

### 7. Difficulties in switching between apps

Applications that are feature specific provide a limited functionality. Users have to juggle between multiple apps, to accomplish a list of tasks. For eg. a separate app is required to book movie tickets, to book a cab and to book a table for dinner on an evening.

## 8. Limited functionality:

Unlike a desktop, or web application, mobile applications have the constraints of display size, computing power and problems of heating of devices etc. due to which limited functionality has to be provided in the mobile apps. Thus for functionalities that are not available on the mobile, users have to use the desktop or web page. E.g. Banking applications.

## 9. Association with smartphones/ tablets

There is no age bar and specific time of the day for using app. It may always not be desirable to access apps over cellphones/ tablets due to battery consumption or other privacy issues. There is a huge scope for other devices that could be specially designed to do justice to apps.

### Future of Mobile Apps:

Based on the limitations of current apps, emerging technology, changing user needs and preferences, the future of apps could possibly be as follows:

#### 1. Push instead of pull.

Majority of the apps work on pull mechanism, where user requests for data and the app provides it to the user. Push Mechanism, also called as server push, initiates the request from the server, without a specific request from the user. An important advantage of push notifications in mobile computing is that the technology doesn't require specific applications on a mobile device to be open in order for a message to be received. This allows a smartphone to receive and display social media or text message alerts even when the device's screen is locked and the social media application that is pushing the notification is closed.

#### 2. App indexing and app deep linking.

Google started indexing apps a few years back. app indexing helps to show the app, when a user does Google search on the mobile browser. With the help of app indexing you get your app found in Google search. Once an app is indexed, mobile users who search for the content related to the app, will see an install button in the search result. This will increase the user base. App deep linking is a method to provide link to the contents in the app. When mobile user search for content related to the app, which is already installed on the user mobile, the search result directly points to the location of the

search result in the app and redirects the user to that location. This would help increase user engagement and retain the customers.

### 3. Lifestyle partners.

An app on the mobile, instead of being a passive entity in one's life, can become an active entity, a lifestyle partner. By computing and analyzing the user behavior, spending patterns, utility bills, these apps will give suggestions to the user as to what needs change, and how would that benefit the user. This might range from suggesting a cheaper internet plan, warning the user about over usage of the utilities like water and electricity and much more. Involvement of such apps in an individual's life will be penetrative, and will create dependency of the user on the app.

### 4. APIs.

The focus of app development will move from GUI based apps to API based apps. Thus the app will no longer be a standalone app, but can connect to many other apps. Apps developers can expose the API's publicly which others can utilize to integrate the app with their app. For e.g., a movie ticket booking app, can integrate an API of a cab booking app to help book cab for the movie from the same app. A hybrid version of the app can also exist, which provides both standalone app experience, and also provides integration points to other apps.

### 5. Content cards.

A card is a bite sized presentation of information. A glimpse of content cards can be newsfeeds. Future mobile apps can implement content card technologies. Instead of having an inactive icon on the device, which the user has to access to view the information, application can be converted to cards, which will show some, but relevant information to the user. For e.g., a weather forecast app, will show today's weather forecast in the card, and if clicked on, will take the user to the complete app. So the home screen of a mobile will not have multiple icons, but a continuous binded heterogeneous information in the form of list of cards.

### 6. Bookmarks.

Bookmark, is a link or an identifier to a specific resource over the internet saved in some form, to access it sometime later in future. Conceptually, opposite to native apps that reside on physical device, future apps will act like only a bookmark on the device. Instead of downloading and installing the app on the device, user will have to only

bookmark the app on the device. User will be redirected to URI of the app through a browser, or app in build viewer, from where the user can access and use the app. These apps would fall under Web Apps category. Their unique feature makes distribution easier and help to eliminate size constraints.

#### 7. **Beacons.**

Beacons are broadcasting services which are able to send messages to devices in a limited geographical radius. iBeacons is an Apple's technology which allows mobile apps to listen for signals from beacons in the physical world and react accordingly. In short, it allows mobile apps to understand a position at a very detailed level, and deliver content to the user based on the location. For e.g. A user carrying a smartphone, walks into a store; apps installed on the phone, listens to the beacon, sends relevant data to the server, the server responds back with a contextual message, which could include targeted advertisements, special offers, and helpful reminders.

#### 8. **Wearables.**

Wearable's or wearable devices or wearable electronics, are accessories that incorporate computer and advanced electronic technologies. Smart watch, health trackers, Google glasses are few of the examples of wearable devices. The future of mobile apps seems to integrate technology in every aspect of our lives. Apps will work in the background pushing notification to the smart watch, where user will take action without opening the app, or even without taking the mobile phone out of the pockets. Health monitors will give immediate warning if the blood pressure has dropped or increased, etc.

#### 9. **Personalized Apps.**

Apps will utilize GPS and other tracking methods to its complete potential, providing users with a personalized app experience. With advanced tools for collecting and analyzing in-app data , app marketers would understand their users preferences and can push personalized notifications like informing user about a discounted price for the item that the user has recently searched for, or provide a review about an upcoming event the user is interested about. With other forms of targeting, users will get more refined messages that will increase user engagement and app loyalty.

#### 10. **Monitoring Oneself.**

Many apps are available that monitor user activities and give different biometric reports to the user. With advancement in the fields of sensors, such apps will become more

powerful and can check from our diet to our workout, sleeping habits, and provide feedbacks and suggest changes in the lifestyle to live a more healthy life. In the years to come, these apps will collect more personal data and give personalized predictions.

#### **11. Sensors, Empowering Machine learning.**

Every phone is equipped with varied sensors, each performing a different operation. Accelerometer and gyroscope for example are used to detect the orientation of the phone. Camera also works as sensor. Apple introduced finger scanner in its new devices last year which is another form of sensor. All these sensors generate data, and through machine learning this data is analyzed and manipulated. Future apps will implement machine learning, to learn about user actions and preferences over time, thus better anticipating what the user wants and catering to the needs of the user at personal level.

#### **12. Unipurpose apps.**

Unipurpose apps, are apps that are intended to perform only one task, or provide only one feature. Initiated by Facebook, and followed by few others, separating apps according to the feature provided, is on the rise. A group of users may want to use a single feature, but might not be interested in the other. Unipurpose apps will provide decoupling from the main app. e.g. a user may want to use Facebook messenger on the mobile, but may not use Facebook app.

#### **13. All under one roof.**

Though, some may support unipurpose apps, but there are times where user would want to perform multiple heterogeneous tasks in one app, without the hassle of switching between apps. API integrations, and cross app collaborations will be seen in the future, giving users an all under one roof experience. E.g., Making a to do list, setting reminders for tasks, sending emails and many more could be combined in a single app, that would help users organize things better.

#### **14. Innovative Mobile User Experience Design.**

With mobile devices entering the market with a bigger and wider display, user's experience of design will matter a lot to the success of an app. Effective display of data and content on mobile will play a major role in enhancing user experience. Few mobile applications like Instagram, Pinterest, have designed patterns depicting innovative designs and interactive interfaces. Leading consumer apps are setting high standards for user interface design, and all organizations must master new skills and work to provide

best user experience. Apps should utilize technologies and provide novel features like interactive contents, eye catching design pattern, cards etc.

#### 15. M-Commerce.

M-Commerce, the mobile version of e-commerce, is trading of goods or other services over internet. M-Commerce apps will see a huge growth in user base and revenue, in the coming years. According to eMarketer, in 2014, 19% of retail e-commerce sales was made from mobile devices. This trend is believed to increase over the next few years. With retailers targeting mobile users with customized discounts and offers, and payment gateways providing added discounts for using their services, have made users move to m-commerce.

#### 16. Enterprise Mobile Apps.

A lot of innovation will be seen on the enterprise front. An enterprise has a number of applications used right from attendance tracking to employee appraisals. However, most of the applications are computer based and there are limited applications available over the phone such as email, OCS, etc. Enterprises will target creating mobile versions of the application, which will help the employees access them anywhere, anytime. And with companies implementing BYOD, it is much more required to have an Enterprise Mobile App.

#### 17. Cloud Apps.

Cloud Computing, is one of the contemporary topics for innovation, and almost everyone is moving towards it. Mobile applications also have a bright future with cloud computing. As opposed to native apps, cloud apps would not reside on the physical device, but will reside on cloud. Users will be able to access applications as a when required using a mobile browser. Platform barrier will no longer exist. Apps can be accessed from any device, any platform and will give the same user experience as that of the physical app. Developers have to develop a single version and need not worry about platform updates.

#### 18. Internet of Things.

“The Internet of Things (IoT), is the network of physical objects or "things" embedded with electronics, software, sensors, and network connectivity, which enables these objects to collect and exchange data.”

Retrieved 07 Oct, from [https://en.wikipedia.org/wiki/Internet\\_of\\_Things](https://en.wikipedia.org/wiki/Internet_of_Things)

Apps will no longer be limited to mobile devices, and their interaction only with users. Internet of things will connect apps to other electronic devices. Using an app on the mobile, one can switch on the car A/C, open the car doors, start the radio, control electrical appliances like refrigerators, washing machines etc.

#### 19. HTML 5.

Development of mobile apps will undergo a major change with introduction of web apps and cloud based apps. HTML5 and related development tools will become popular in developers. Thus the developer needs to have knowledge of HTML5 JavaScript and CSS only to develop an app, as opposed to platform dependent app development. As this technology enhances, enterprises will adopt to “hybrid” as primary technology for mobile apps. Hence, developers should be aware of hybrid technologies and may rethink about their focus on native.

#### 20. Hybrid Apps.

A combination of native apps and web/cloud based apps, is known as a Hybrid App. Hybrid apps will also be seen in the market in few years, where basic functionality will be available on the native app, and for advanced functionalities users might be redirected to a browser, or the app could implement an in-app browser to provide the service. Hybrid apps eliminate the drawbacks of web apps, which cannot use some of the mobile features like, notifications, GPS and storage and also gain advantage over native apps, with platform independence, low maintenance, download size and reduced disk storage.

#### 21. Loyalty schemes in mobile apps

Loyalty schemes are not new; retailers provide traditional loyalty card to customers with offers and discounts. Retailers apps, will implement the e-version of loyalty cards to offer instant rewards and offers as well as location-based messaging. By closely evaluating the business needs and potential benefits, implementing app loyalty schemes will encourage people to engage with the apps. In near future, mobile loyalty apps will play an increasingly prominent role over traditional loyalty cards.

## II. Conclusion:

Mobile apps have come a long way from the day the first mobile app was introduced. However they yet have to reach the limit. Mobile apps will play a very crucial and integral part in everyone's life, assisting, guiding and suggesting in every aspect of one's life. Mobile

apps will have a penetrative effect in one's life and users will be more dependent on technology than ever before to perform even basic tasks of life.

Future will see a lot more changes, developments and advancements in the technology of mobile and mobile computing resulting into innovation and personalization in mobile apps. The possibility of mobile apps getting replaced by something else cannot be denied.

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