APPS ECONOMY : A STUDY

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—— **ABSTRACT** ——

In 2017 Apple introduced its iPhone in the world. Its arrival gave birth to an industry that had the potential of reaching a figure of US$100 within the next decade. Since its arrival the mobile apps industry has experienced unprecedented growth. The current apps economy, it's evolution and impact on everyday life has been widely discussed in this paper. The paper has also discussed the role played by apps in popularizing smart phones and different devices. Mobile apps have revolutionized social networking, electronic retailing and gaming. As major competitors in this arena, Google and Apple, the giants in mobile operating system are constantly striving to provide the best apps to customers by tying up with app developers all throughout the world . Other players like Amazon, RIM, Facebook, Blackberry are constantly working to strengthening their niche positions in market. All studies are pointing towards a very bright picture of the apps economy. Lastly, the apps economy has some issues related to privacy and security, child protection, monetization and lastly profitability.

Keywords: High Growth Industries, Apps, Mobile, Gaming, Marketplace

APPS ECONOMY AND IT'S EVOLUTION

With the arrival of IPhone, users are getting all the benefits and facilities of computers in hand. That's why IPhone and other devices with smart applications have been termed as smartphones. Smartphones with apps have become common devices in the hands of people these days. Though a good number of apps have similarities still there is no decline of consumers towards apps (Frierman, 2011). With the boom in the usage of smart phones, more and more apps will come into this world. In the study of "The Mobile Movement" conducted in the year 2011 it was found that there is apparently a shift in the usage of consumers from computers to smart phones (The Mobile Movement,2011).

In 2010, the sales of smart phones outnumbered the sales of personal computers. This led tech analysts to shift their attention to handheld devices. Comparing the fourth quarter of 2009 with 2010 sales of smart phones rose to 100.9 million from 53.9 million. As per Flurry, global consultant dealing in mobile software data and software development shipments of notebook and desktop computers got surpassed by tablet and smartphone shipments. Already smart phones have replaced computers in different activities like web browsing,instant messaging,e-mailing. Flurry also found out that consumers are spending more time in different apps rather than internet.

Consumers are spending a lot of time on smart phones. A Google study on 5013 US consumers along with Ipsos found that 89% consumers use their smart phones all throughout the day.68% informed that they had already used an app in the previous week. 79% consumers reported that they take help of smart phones for online shopping while 22% carries out purchase through smart phones (The Mobile Movement, 2011).

Governments and local bodies are creating apps catering to smart phones so that general citizens can get access to different governmental services. US President Mr. Obama declared that all federal agencies make at least 2 of their services available on mobile phones by May, 2013. President Obama took this decision with the objective of creating innovation generating more employment opportunities. This decision of the US President helped developers to introduce more and more creative user-friendly apps thus carrying out value additions for US citizens. The increased use of smart phones have forced Governments all throughout the world to open up more and more bandwidth for mobile

services. Infact, the efforts of President Obama paved the way for a big boom in use of mobile apps (Melvin,2012).

APPS ECONOMY BASICS

Though the apps economy started with the arrival of Apple but its high pace took place due to the entry of a large number of competitors like Samsung, LG Motorola, Blackberry, ZTE, Huawei. The competition has given birth to a entirely new category i.e. smart phones. Smart phones have gained more popularity than general feature phones as apps can be run on smart phones only. Apps enable smart phones to carry out different functions like mailing; playing videogames, movies and music. With the help of apps smart phones can contact with any computer from all throughout the world (Coustan & Strickland,2012). Smart phones have different features similar to a computer. Smart phones have such features like internal storage gadgets, display adapters, USB ports, RAM sticks, processor. The devices can be customized and upgraded to suit the requirements of consumers. Nowadays most of the smart phones have powerful touch screens thus eliminating the need of a physical key board. USB peripherals such as data transfer cables and audio headphones are also available (Coustan & Strickland,2012).

The most important element of a smart phone is the operating system or OS. The OS contains all of the drivers to carry out activities in coordination with the hardware and software of the device. The operating system being a stack of software has different layers. The first layer consisting of the kernel manages the hardware of the smart phone such as USB port and or built-in-camera. Software libraries having connection with different applications exist in middleware. Application programming interfaces are another part. Lastly the application suite consists of applications which arrive with the overall package of the mobile by default. The applications are calendars, messaging, digital assistant, phone logging software. Now, a mobile app is a software which is required to perform a certain task. For example, Android phones have GPS app which helps in tracking location of the user (Coustan & Strickland, 2012).

EFFECTS ON MOBILE GAMING

Before the arrival of smartphones users carried out

mobile gaming in their handheld devices like the ones of Sony or Nintendo. Now after the emergence of smartphones several games with great graphics being played in smartphones are entertaining the consumers. Both Android and Apple iOS are capable of running some of the best games in the industry. That's why Sony and Nintendo devices are losing their market share before smartphones (iOS and Android Take Over Mobile Gaming Industry, 2011).

EFFECTS OF TRADITIONAL WEBSITES

The rising popularity of apps has also put presented challenges before traditional websites. Technological advancements have helped developers to make significant progress in both web browsing and mobile browsing. There are a number of reasons for the rising popularity of apps in comparison to traditional websites. Firstly, an app can be accessed from anywhere in the world without the need of any big hardware. Secondly, most companies have created mobile versions of their websites so as optimize user experience along with faster loading. Thus, by 2011 the number of users accessing websites from mobile phones exceeded those accessing from computers (Smart phone Mobile Applications To Overtake Standard Websites in Near Future, 2012).

TYPES OF APPS

Apps can be divided into two types. That is mobile and native. Mobile apps run directly from an online interface such as a website. Native apps integrate directly with the operating of mobile and lead the hardware to do something. Native apps can also lead to more functionality and efficiency. Both of the applications can't manipulate the hardware of the smart phone and are limited to only website application(Industry Innovations: A Mobile Applications Interview with Bob Evans, 2011).

Some hybrid apps combine coding and interface features of a web based interface. This also allows the developers to update the apps along with required functionality. The number of platforms which will be used for running the application can be extended (Industry Innovations: A Mobile Applications Interview with Bob Evans, 2011).

Currently Google's Android and Apple's iOS both have

marketplaces from where apps can be purchased. A good number of apps are packaged with the operating systems. But, a majority of the apps need to be purchased from their marketplaces (Coustan & Strickland,2012).

COMPARISON BETWEEN MARKETPLACES OF APPLE AND GOOGLE

A market place of mobile apps means a repository where apps are kept for download or distribution. Both free apps and for sale apps are available in the marketplaces. These apps are developed by third parties or free developers who want to distribute the apps for free or for sale. The apps are also distributed by developers to promote their other products. Both the marketplaces of Google and Apple offer different types of apps. Along with the above other third-party marketplaces also distribute apps at different price that are uniquely available to those sites(Coustan& Strickland,2012).

Generally two types of apps stores exit in the virtual world. They are (a) Catalogue stores are those stores that sell multiple applications related to operating stores and are associated with high end apps (b)Platform specialists are those that concentrate on only one type of operating system. These marketplaces help the users to compare different applications in terms of features, price, effectiveness. Catalogue stores in comparison to platform specialists distribute apps in much lesser price. User's intention to pay a higher price for an app depends on the marketplace (Mikalajunaite, 2011).

Apple's restrictions with regard to app development led to more users developing apps for Google's Android. Though a number of announcements were carried out by both Apple and Google with regard to app development, Google emerged as the clear winner. Thus, in a survey it was found that 58.6 % developers intend to develop apps for Google whereas only 34.9% developers prefer Apple for app development (Cameron, 2010). Seeing the results of preference of developers for Android, Apple took a lot of steps like relaxing the conditions for app development. Apple also released different documents to educate general public regarding rules of accepting apps for its marketplace. But still 62% of developers prefer to develop apps for Google's Android in comparison to

48% for Apple. The lesser preference of developers in developing apps for Apple may pose some unique challenges before the company((Cameron, 2010).

Google also have its unique set of challenges. Amazon a new entrant has decentralized the users from adopting apps. The entry of Amazon and Facebook, two deep pocketed players will provide tough competition to Google. In this regard it's to be considered that the entry of so many competitors will bring more users and developers into the apps economy. Ultimately it will be beneficial for apps economy (What Developers Should Know About Amazon's Android App Store, 2010).

AMAZON'S MARKETPLACE

Amazon has also developed a marketplace in order to distribute apps which works in coordination with Google's Android. The marketplace also acts as the main interface for Amazon's Kindle Fire which runs based on a restricted Android OS version. Amazon created the marketplace in order to provide a better, organized and friendly experience to users.

Just like its competitors, Amazon breaks up its app sale revenue as per ratio of 70:30 where 70% of the revenue goes to developers and the remaining 30% revenue taken by Amazon. It also keeps the right of modifying an app is required and add its DRM (Digital Rights Management) in order to prevent piracy of the app. In comparison to Android, Amazon has set a number of rules for developers to follow. For example an app available in Amazon's marketplace cannot be sold in Android. Also developers must at first provide the update of the app to Amazon before any other marketplace (What Developers Should Know About Amazon's Android App Store, 2010).

FACEBOOK'S MARKETPLACE

In coordination with its partner Zynga, Facebook has invested good amount of money in the apps economy. The rising popularity of Zynga's apps related to games have proved to be beneficial for both the companies. Around 15-20% of Facebook's revenue comes from the processing fees of Zynga's gaming apps. However, the future of their success depends on how they can harness their friendship in development of mobile apps as the growth of mobile gaming apps have surpassed online social games (The Most Important Friendship: Facebook and Zynga, n.d.)

In Asia Facebook has been particularly successful in adding members through mobile games. In Japan, Facebook has been particularly successful mobile site that has been quite successful in mixing social media with games. Thus according to data from Google, Japan's smartphone usage has tripled within a year. In a similar fashion, in the first half year of 2012 Facebook had added 2.5 million workers(Wagstaff, 2012).

Facebook has its unique set of challenges in India. Sale of smartphones and data usage are increasing at a very fast clip in India. Since the closure of Chinese market by authorities over there India is the only market for Facebook to have a huge number of potential users. Though 4G mobile technologies have been introduced in India still due to budget constraints large number of Indians are unable to use smartphones. Thus, Facebook has to devise big screen experience to customers with basic phones (What Developers Should Know About Amazon's Android App Store, 2010).

According to Mark Zuckerberg, Facebook CEO his goals are development of mobile applications, integration of Facebook's mobile app with other apps and creating a next generation advertising experience for customers. As per experts Facebook needs to monetize its presence with developers for future existence. With the above goals in mind Facebook is emphasizing on social advertisements based on likes and information collection such as location of users for targeted advertising (Barr, 2012).

One way through which, Facebook has targeted to enhance presence in the mobile world by developing its own App Center. The center will be a hub for mobile apps which can be accessed by users. These apps are reviewed and cleared by Facebook after they have met their quality standards. Rather than downloading apps randomly users will be able to download apps recommended and liked by their friends. App Center also gives users links to marketplaces of Google and Apple from where the apps can be downloaded(Barr, 2012).

BLACKBERRY ANDROID'S MARKETPLACE

In 2011 Blackberry announced its entry into mobile application space by introducing Playbook tablet than can run Android applications. The device can also run based on Blackberry Java apps. The applications are available in Blackberry App World, a dedicated marketplace for Blackberry and Android based apps. However other app marketplace belonging to Google and Amazon are not compatible with this device. This brings in a little complexity for Android based app developers. That's why more apps are available for Android rather than Blackberry's playbook. That's why in 2011 it was found that Android has 12 times of Blackberry's apps (RIM's New Playbook Will Be Able to Run Android Mobile Applications, 2011).

OTHER SPECIALIZED MARKETPLACES

In recent times a number of smaller companies have entered into apps economy. These companies are much smaller than Apple or Google. That's why they have taken the path of niche areas. Since 2009 there has been an increase of niche app marketplaces. This increase is much more than general app marketplaces. This development shows the preference of smaller companies in getting into apps economy through niche app marketplaces (Gair, 2011).

Niche marketplaces provide apps to users to fulfil their specific needs. Thus, a lot of confusion existing among users and developers get removed in the process. Developers also can avoid a lot of competition which they need to do in general app marketplaces. Mostly, there are three types of app marketplaces. 1) Platform based marketplace 2) Target group based marketplaces 3) Carved out marketplaces(Gair, 2011).

CONSUMER PREFERENCE AND MOBILE APPS

By 2010 the apps world became saturated with the entry of a large number of players introducing both lifestyle related and utilitarian apps. A lot of surveys were carried out to introspect into consumer preference of mobile apps. It was found that consumers mostly prefer games apps. Specific apps like Weather Channel, Google, Facebook have the highest popularity across all platforms. Linked In was also found to be quite popular among the age group of 25 to 44 years age group. The Weather Channel was the most preferred app in news and weather category with 58% respondents voting for it. Amazon, Flipkart, Snapdeal were the most preferred shopping apps. Last but not the

least the music category was dominated by Raaga, iTunes, Yahoo, Pandora (The State of Mobile Apps, 2010).

Data as collected by Flurry in May,2011 shows that Facebook, followed by social networking and games apps are the most popular apps among consumers. It was also found by Flurry that users are spending more time in social networking in smart phones than computers. Even for playing games users were using social networking apps (Newark-French, 2011).

As per different surveys Android followed by iOS, Windows Operating System, Symbian are the most popular smart phone operating systems. The reason for their popularity is not only convenience offered by these operating systems but also the popularity of the devices associated with them. (State of the app industry 2010 (report), 2010).

With a view towards development of its operating system, Microsoft is providing several incentives to developers. It has also invested good amount of money in promoting its product by getting favorable feedback from technology reviewers(State of the app industry 2010 (report), 2010):

DEVELOPERS AND APPS ECONOMY

In order to maintain the edge in the super competing apps world, Google and Apple must have to attract better developers who will produce innovative apps and operating systems. Without the cooperation and involvement of developers the supply of apps will come down leading to shifting of users to other platforms. Thus, innovative business models must be introduced by companies to attract developers.

A great business model ensures good coordination and cooperation between publishers and developers. It also leads to a conducive environment for app development. With faster development of apps developers can allocate resources towards enhancing the features and appearance of the apps rather than wasting time on unimportant areas of app development. One of the best sharing practices of Google and Apple is sharing of APIs i.e. Application Programming Interfaces through which developers can access libraries of codes thus reducing the work burden of developers. These APIs help in a great manner in enhancement of efficiency, reduction of bugs and simplification(Power, n.d.)

In 2012, Alliance of Application Developers created in Las Vegas has the primary objective of increasing the skills of app developers through great training, access to cloud services and lobbying with the government, superb industry association. At present, this alliance is working for platforms like Blackberry, iOS, Android (Essany, 2012). The facilities provided by the alliance is an online database for coordination between publishers and developers, development tools, infrastructure for application testing, low cost of free documentation, training and certification, cloud services(Essany, 2012).

REVENUE GENERATION THROUGH APPS

Through different means developers earn money. The most popular way is to release an app free of cost and then to release revenue by carrying out advertisements utilizing the app's interface. Whenever an ad gets clicked by user immediately revenue get generated for the publisher. By this method an ad can be placed easily and reach of the app can be generated multiple times. The disadvantage of this method is that revenue generated is quite low. Also, seeing advertisements users may avoid such apps (Holbrook, 2011).

Again, the app can be sold by developers on different platforms. In such a regard, the platform owner like Google or Apple charge 30% of the revenue. However for free apps no charge is made by the platform owners. Marketplaces may also charge developers a certain amount of money to set up publisher's account. However, with the presence of so many apps, it's a cut throat competition in app world. The app has to be original, creative and marketed properly in order to generate sizable amount of revenue.(Holbrook, 2011).

Another very successful model of revenue generation is distributing the app in two forms. First form is for sale with full functionality and limited advertisements. The second form is to make the app available for free with limited functionality and sponsored advertisements. This dual option gives the users a great option of experiencing the app for free at first and then to purchase it once he finds it be value for money. Off course in order to make this model successful the developer must carry out proper distribution of features in both the apps. If most of the features are made freely available then the incentive to purchase the full version

app will not exist. Again with the offering of too few features customers will simply overlook or ignore the app's full potential. An app can be provided as a compliment to an existing product. A superb quality app can speak volume of the skills and acumen of the main company. Also, apps can be provided to help customers to use a product more conveniently. Industries such as financial services, mobile games, media are currently exploiting this model. Several developers and companies generate revenue by building an electronic store within the app (Holbrook, 2011).

Finally it's to say that no single policy will succeed when it comes to generation of revenue through apps. Rather flexibility should be adopted in the process of selection of business model. Each application must be analysed on a case to case basis in order to determine the best business model, optimal market and price structures. Through a proper analysis of customer demand trends app publishers and developers can maximize their revenue (Mikalajunaite, 2011).

PRIVACY AND SECURITY ISSUES

Privacy and security issues are the biggest factors in the app economy. All major players have faced issues in this case. Although market leaders such as Apple and Google have worked hard but still issues remain. For example, a social networking app named Path was found to infringe upon personal information of users. Once downloaded the app was to transfer all data of users to the company's database. After corrective action was taken by Apple, the app morphed into a form which could mine address books of users. Thus, the app became a source of frustration and controversy among Apple consumers (Satariano & MacMillan, 2012). The ensuring negative publicity went to US Congress with the Federal Trade Commission was tasked to investigate into Google and Apple (Lowensohn, 2012). Microsoft took a very liberal approach for developers to introduce new apps. Whereas Apple took a stricter approach. In February of 2012 an understanding was signed in the presence of Kamala Harris, attorney general of California by leading companies like Hewlett Packard, Amazon, Microsoft, Research in Motion, Google, Apple to improve the privacy issues in their apps and operating system. Under this system, the developers will have disclose different types of data

related to the apps. Android possess a benchmark permissions system which allows an app to access data along with required permission (Mills, 2012). The Federal Trade Commission(FTC) in 2012 had decided that they will be active in apps economy to ensure the presence of proper safeguards (Poss& Hasty, 2012).

Most of the privacy issues related to Apple's iOS originate from the unique device identifiers(UDIDs) made available by its operating system. According to MoPub, has prevention of access to UDIDs can lead to 24% revenue decline for app developers. Now, Apple must have to create alternative means of identifying users.(Vascellaro, 2012; Cooper, 2012; Aimonetti, 2012). Another fraud practice being carried out is applying bots and workers to show that an app has been downloaded a number of times thus manipulating the advertising revenue. Due to strick policy taken by Apple in preventing such practice it saw a decline in its revenue by 24%(Satariano& MacMillan, 2012).Some companies try to manipulate the main boards by paying people to download, review and rate a certain app to increase its popularity. Others also introduce slight variations of popular apps.In order to prevent such fraudulent practice Apple in early 2012 introduced Chomp a search engine with great algorithms to guide users about different apps. (Satariano & MacMillan, 2012).

TRENDS IN THE APP ECONOMY

Some of the trends currently taking place in the app economy are hereby discussed below:

a. **Mobile Page Acceleration through EMM and AMP:** Since the integration of Application Performance Management (APM) with Google search in 2016 developers haven't looked back. This melted down version of HTML has led to better experience of users and thus ensuring their retention. Facebook Instant Articles have become a big hit right now due to the integration of the above mentioned feature. This feature is going to be a staple in 2019.

b. **Artificial Intelligence and Machine Learning:** Both AI and ML have penetrated deep into the app economy. AI has been very effective with regard to chatbot operations. Siri, Google Assistant are big examples in this regard. AI and ML are also helping experts in detecting hateful contents which

may incite violence. In 2019 more applications of AI and ML will take place.

c. **Spurt in the demand for IOT enabled wearable devices:** Credit goes to Apple, Google, Amazon for introducing a number of IOT enabled wearable devices such as smartphones, cameras,tabs. A number of app based companies like Zomato, Uber, Ola have invested huge sums of money in IOT. In 2019 more of such IOT enabled devices will be introduced such as fitness bands, movement trackers etc.

d. **Chatbots :** The market for chatbots is set to explode from US$100 billion in 2016 to US$125 billion in 2025. Without intricate coding chatbots can be introduced into apps right now. As per a study,50% of the buyers in B2B space prefer self service CRM tools. From financial services to higher education chatbots are proving to be a very effective tool in disseminating information.

e. **Augmented and Virtual Reality :** Both augmented and virtual realities are playing significant roles in the app economy. Pokemon Go is a great example in AR space. With regard to Virtual Reality several e-commerce companies staring from Amazon to Flipkart are applying VR to provide better customer service. The combined market of AR and VR is slated to touch a figure of US$ 200 billion by 2025. Combining both AR and VR will lead to breath taking app for the customers.

f. **Mobile wallets and payment gateways :** Customers demand smooth payment procedures. That's why there has been high demand for mobile wallets and payment gatways. From cash to plastic cards to mobile wallets and digital currencies customers have come a long way. Mobile wallets, payment gateways along with great app experience thus have gained great popularity.

Some of the well-known mobile payment wallets and apps are Amazon Pay, Google Wallet, Pay Pal, Paytm. Off course encryption of the wallets and gateways is to be given emphasis.

g. **Cloud Computing :** Companies are utilizing cloud computing technologies in a big manner to store and to mine data. As per Industry 3.0, cloud computing has become an important element. Some of the advantages of using cloud computing are user retention, superb streamlining of operations, excellent video streaming, storage and lesser hosting cost.

h. **Instant apps and security :** 2016 gave the birth to instant apps. These are apps which are very convenient to use, user friendly and smaller than general apps. There is no need to download these apps and they can be accessed instantly. With the demand for shorter loading time and better experience from users these apps are going to be real game changers in 2019. Also security of these apps will also get top concern as recently Google, Facebook and Uber agreed to having serious security lapses.

i. **Predictive Analytics :** From mere utilities mobile apps are going to be major elements in corporate workflows. All of the giants like Uber, Facebook, Google are investing huge amounts of money on artificial intelligence(AI) in order to make analytics more predictive.

FUTURE TRENDS

The future scenario of apps economy is very bright. All the studies are showing major jump in every aspect of the apps economy. By 2022, 6 billion devices will be in use in the world. Spending will touch a figure of US$157 billion. The number of app downloads will touch a figure of 258 billion. In this scenario, some of the trends going to be set in future are as per the below:

1. Smart phone based app technologies are going to disrupt industries across sectors. Already sectors like travel, entertainment, media, taxi, fast food have been disrupted by apps. Now app developer are working to revolutionize professional services related to legal, financial and medical sectors.

2. No organization will be immune from the apps economy. The future will be long to great ideas. Small organizations with great ideas will be able to build up global business based on ideas.

3. Smart phones will get bigger and better. Technologies currently experienced in higher priced gadgets will get into the lower priced devices. Better smart phones will put pressure on the sales of tablets and devices. In future, days will

come when people will no longer need laptops as most of their work will be done in smartphones.

4. Not only in terms of size but smart phone screens will become more flexible. As smart phones will increase in size so, they will be made more pocket friendly by becoming foldable.

5. Both technologies like VR and AR will become more become part of our lives. Both the technologies are impacting significantly in industries such as design, healthcare, education, gaming etc. Wearables will be also quite effecting in the furture. Future wearable forms will be in terms of health trackers and Google Glass.

6. Artificial Intelligence(AI) is getting more applications in the app economy. Algorithms related to Machine Learning along with AI are making huge strides in apps world.

7. Internet of Things(IOT) and drones are also another great addition in the apps economy.

8. Last but not the least apps applicable in multiple platforms are gaining in more and more popularity as days are passing.

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