Platform Business Models and Mobile Ecosystem

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1. Introduction

This paper focuses on the emergence of platforms as business models how mobile ecosystems offer a new canvas for the emerging platform business model. The aim here is to analyse the factors leading to the growth of platforms as business models over the dominant conventional pipe model and their fundamental differences. Further the paper discusses the major stakeholders in the mobile ecosystem and supporting case studies to enhance the perception of 'platformisation' of the mobile industry to derive a few insights on platform theory.

The major events leading to the onset of platforms apart from the primary reason, the introduction of internet, involved a market shift from customers to producers. Further the paradigm shift from resources to ecosystem introduced ecosystems as the new metric of a powerful business and a new source of competitive edge. For example Airbnb and Uber aren't multi-billion dollar businesses for the employees and re-sources they control in-house but for the ecosystem they succeed in attracting. Another crucial factor was the shift from processes to interactions. While hotels and traditional cab companies owning their own fleet would get a team of MBAs working on maximizing capacity utilization, Airbnb and Uber focus on getting data scientists to improve algorithmic matching of supply and demand. Nowhere is the shift from process to interactions better exemplified than in the shift from process re-engineering to data science as the highest paid skill in companies. [1]

The sections ahead discuss the business models in general, moving ahead to platforms and finally to mobile ecosystems and supporting case studies.

2. Business Models

The formal definition for business models defines it as a plan implemented by a company to generate revenue profit from operations. The model includes the components and functions of the business, as well as the revenues it generates and the expenses it incurs. [2]

The term business model was a buzzword during the dotcom boom during 1995. In fact, poorly thought out business models were the downfall of many dotcoms.

However the concept of a business model dates back way back to the early days of business. It merely describes the way in which a company makes money. A business model can be simple one or very complex based on several factors ranging from the type of organizations to their size. A simple

restaurant's business model analogy can help us get an insight on the goals of a business model. A restaurant's business model is to make money by cooking and serving food to customers. Whereas a website's business model might not be so clear, as there are many ways in which these types of companies can generate revenue. For example, some make money (or try to) by providing a free service and then selling advertising to other companies, while others might sell a product or service directly to online customers. [3]

We can hence summarize a business model to be nothing else than a representation of how an organization makes (or intends to make) money. Business modelling is the managerial equivalent of the scientific method- you start with a hypothesis, which you then test in action and revise if necessary. [4]

The business model is a very trending discussion among business professionals today as various industries show a proliferation of new and innovative business models. In several industries new business models are threatening or even replacing established companies and conventional ways of doing business. A good business model begins with an insight into human motivations and ends in a rich stream of prof-its.

3. The Rise of the Platform: A Seismic Shift in Business Models

Traditionally, Pipes have been the dominant model of business. Firms create stuff, push them out and sell them to customers. Value is produced upstream and consumed downstream. There is a linear flow, much like water flowing through a pipe.

The pipes have a widely adopted approach across organizations. Our education system offers a nice analogy. The system can be visualized as a pipe where teachers push out their ‘knowledge’ to children. Prior to the internet, much of the services industry ran on the pipe model as well. [1]

However since the dawn of internet we have come across importance of platform business models. The platform approach is fundamentally different from pipes, as the focus here is not solely in manufacture within and delivers out, instead the platform gives the consumer the freedom to both create and consume value. The two layers namely, the technological and the business layer work in tandem to achieve this model. At the technology layer, the goal of a developer is to make richer APIs to extend user functionality. While at the business layer the users (producers) can then use the existing APIs to create value on the platform for other users (consumers) to consume. This is a massive shift from any form of business we have ever known in our industrial hangover.

An analogy at this juncture can help distinguish between the two models. TV Channels work on a Pipe model but YouTube on the contrary works on a Platform model. Encyclopaedia Britannica worked on a

Pipe model but Wikipedia has flipped it and built value on a Platform model. Our classrooms still work on a Pipe model but Udemy and Skillshare are turning on the Platform models for education.

4. Platform Business Model

The word platform has been around for some time now over the past 25 years or so - in literature and discourse within economics and management science research, business management, scientific, and government circles, technology marketing, and business, scientific, and popular press and media. “Platforms” are much discussed, today, in errantly-released internal Google emails, in a recent informative business book of Phil Simon (proclaiming that we have entered The Age of the Platform). [3]

However once the distinction between the two models is realized, a misinformed implementation can result in a disaster. Since the Pipes have been the primary models over the last few centuries, the similar execution model is often wrongly coupled with building platforms. As an entrepreneur this scenario should be avoided. The distinction extends over many cases covered in subsequent sections over several aspects.

4.1 User acquisition

Getting users on board is fairly straightforward for pipes. You get users in and convert them to transact. Much like driving footfalls into a retail store and converting them, online stores also focus on getting users in and converting them.

Many platforms launch and follow pipe-tactics like the above. Getting users in, and trying to convert them to certain actions. However, platforms often have no value when the first few users come in. They suffer from a chicken and egg problem, which I talk extensively about on this blog. Users (as producers) typically produce value for other users (consumers). Producers upload photos on Flickr and product listings on eBay, which consumers consume. Hence, without producers there is no value for consumers and without consumers, there is no value for producers.

Platforms have two key challenges:

1. Solving the chicken and egg problem to get both producers and consumers on board.

2. Ensuring that producers produce, and create value.

Without solving for these two challenges, driving site traffic or app downloads will not help with user acquisition. Startups often fail when they are actually building platforms but use Pipe Thinking for user acquisition.

The Pipe Thinking in the above scenario focuses on optimizing conversion funnels to grow. The Platform Thinking in the above scenario focuses on building network effects before you optimize conversions. [3]

4.2 Product design and management

Creating a pipe is very different from creating a platform. Creating a pipe requires us to build with the consumer in mind. An online travel agent likeKayak.com is a pipe that allows users to consume air lie tickets. All features are built with a view to enable consumers to find and consume airline tickets.

In contrast, a platform requires us to build with both producers and consumers in mind. Building YouTube, Dribble or AirBnB requires us to build tools for producers (e.g. video hosting on YouTube) as well as for consumers (e.g. video viewing, voting etc.). Keeping two separate lenses helps us build out the right features.

The use cases for pipes are usually well established. The use cases for platforms, sometimes, emerge through usage. E.g. Twitter developed many use cases over time. It started off as something which allowed you to express yourself within the constraints of 140 characters, moved to a platform for sharing and consuming news and content and ultimately created an entirely new model for consuming trending topics. Users often take platforms in surprisingly new directions. There's only so much that customer development helps your with.

The Pipe thinking in the above scenario focuses on user interaction with software we create. The product is valuable of itself. The Platform thinking in the above scenario focuses on the users interaction with each other, using software created. The product has no value unless users use it. [3]

4.3 Monetization

Monetization for a pipe, again, is straightforward. You calculate all the costs of running a unit through a pipe all the way to the end consumer and you ensure that Price = Cost + Desired Margin. This is an over-simplification of the intricate art of pricing, but it captures the fact that the customer is typically the one consuming value created by the business.

On a platform business, monetization isn't quite as straightforward. When producers and consumers transact (e.g. AirBnB, SitterCity, Etsy), one or both sides pays the platform a transaction cut. When producers create content to engage consumers (YouTube), the platform may monetize consumer attention (through advertising). In some cases, platforms may license API usage.

Platform economics isn't quite as straightforward either. At least one side is usually subsidized to participate on the platform. Producers may even be incentivized to participate. For pipes, a simple formula helps understand monetization:

The Pipe thinking in the above scenario focuses on the charges consumers pay for value created. The Platform thinking in the above scenario focuses on figuring who creates value and who gets charged for that. [3]

5. Types of platform Business Models

The methodology used to outline and analyse business models is based on the framework presented in Ballon (2007), which is in itself a revised version of the framework offered by Faber et al (2003). This framework examines business models in terms of value streams as well as shifts in power between a set of abstracted entities. These entities include roles, actors and stakeholders. A business role can be defined as a discrete set of responsibilities, actions, activities and authorizations that together have a coherent value-adding logic. A business actor is a marketplace entity that encapsulates a coherent set of roles. A stake-holder can be defined as a current real-life organization (a specific individual, institution, company, organization, etc.) with an interest or stake in the outcome of a certain action. [5]

Using these design elements allows for the analysis of business models on different levels of granularity. Currently, various competing yet highly diverging approaches to mobile service platforms can be observed in the market. Mobile service platforms range from fairly modest or application-specific platforms to all-encompassing service development and deployment environments integrating low-level as well as high-level telecommunications and IT capabilities.

As the cases gathered here will demonstrate, entirely different platform architectures as well as business model approaches can be observed, dependent upon the particular set-up and control of the four identified gatekeeping roles. [5]

5.1 Telco-Centric platform Model

The first business model considered one that has been common in the mobile industry so far. An example based on this model is the Vodafone Live! Platform. This model places the majority of roles within the domain of a single real-life stakeholder, i.e. the telecom carrier, which acts as portal provider, service aggregator, network operator and platform operator. [5]

In this model, the user accesses services via a portal screen. The portal provider is incorporated in the network and platform operator, creating a single entity that plays a mediating role. The network operator grants access to the network, while the platform operator provides the necessary technical tools to facilitate this access and provides an environment in which the portal provider can operate. The portal provider also aggregates services making them more easily available to the end user. The business entity comprising these different actors, which in real life mostly coincides with a telecom company, establishes relationships with select services providers who can offer their services via the portal. Service providers can be exclusive partners of the network operator, or be third parties. Revenue streams can be identified be-tween the user and the telecom company, and between the latter and service provider. Services flow from the service providers to the user via the telecom company. [5]

A representative case of the telco-centric model is the Vodafone Live! Platform, which is currently available in 28 countries.

5.2 Device Centric Platform Model

The device centric model is a model where the main service platform roles are incorporated in, or tied together with, the mobile device. A real-life example is the Apple iPhone. The recent introduction of this mobile device has presented the mobile industry with a number of business model innovations. [5]

In this model, several services are offered as an integral part of the device. The user gets access to a number of services embedded into the device, which can be operated in an intuitive way. In this model, the device manufacturer functions as portal provider, choosing and controlling which services are made available to consumers. This actor also defines what specific platform is used to provide services to the user. Most of the platform operator activity is performed by the device manufacturer, as almost all information and tools needed to develop services and applications for the device are internal to this actor. The manufacturer can also provide tools and resources in the form of a Service Development Kit (SDK) to service providers for the development of new services. Profile information can be managed by the device manufacturer or by the service provider, depending on the type of service. The device manufacturer al-

ready integrates a large set of services into the device. One of the selling points may be that these are mobile versions of services the manufacturer already offers for other devices (i.e. laptop and desktop computers). The device may be offered to the user in various ways. It can be linked to a specific network operator's subscription through a system of contracts and e.g. SIM cards. In another model, the device is offered in an operator-agnostic way. The network operator may also strike a deal with the manufacturer to subsidize part of the device towards the customer, locking the latter in to the network operator for a specific amount of time for example. Services are presented to the user on the home screen of the device. There is another aspect to this model that provides a role for a mediator, be it online or offline. This refers to the fact that the user can access certain services without the need of a mobile network operator; he or she can connect his mobile device directly to his personal computer in order to be provided with offline and online services, with access being provided by another actor than the mobile network operator (i.e. an ISP). For instance, an important service is that the user can buy music online through his fixed computer and place it on his mobile device, without the brokerage of the mobile network provider. [5]

This model is based on the introduction of the iPhone handheld as mentioned above, by Apple in 2007. In this case Apple builds the device - that in essence plays the role of portal to the user and it determines the platform on which software and services should be developed.

5.3 Aggregator-Centric platform Model

A service portal is an obvious way to disclose services to a user, but the aggregator centric platform model takes this model a step further, in the sense that the function of portal provider is taken over by a third-party service aggregator. A real-life example is the mobile version of the social networking site Facebook, i.e. Facebook Mobile. This will be used as a case to illustrate this model. [5]

In this model, the service aggregator takes on the role of portal provider. It serves as the portal to the user, who can choose to install several smaller applications that coincide with personal interests and preferences. The user pays the network operator for access to the network and gains access to the portal. However, the service aggregator is not bound to a specific network operator and so the portal can be accessed by any supported device. Herein also lies the main difference with the telco-centric model. Service providers can develop a slew of smaller applications that can run in the portal. This means service providers are confined to the platform the portal uses to deliver the services. However, in some cases users can ac-cess services without the mediation of the portal. A service provider can choose to provide service access via the portal provider and/or provide the service to the user directly, i.e. via a webpage. In

this model, the

role of the platform operator is performed by the portal provider/service aggregator. This actor defines the language in which applications have to be developed, hosts the services, facilitates assembly and creation of services and manages profile information. Indirect revenues are expected to be crucial in this model, either from advertisers or from revenue sharing deals with device manufacturers or network operators. [5]

The aggregator model is used by online social networking site Facebook, which has drawn a lot of attention in 2007 for its exponential growth as well as for its controversial advertising program Beacon.

5.4 Service Centric Platform Model

The service-centric platform model constitutes a more or less theoretical model for now. It is a base for plans and models surrounding Google's Open Social initiative concerning open API's for social networking applications. In this fourth model, the focus is entirely on services, which become 'platforms' by themselves. The user connects via a network operator of his or her choice and selects services on a case per case basis. The selection of these services may or may not be facilitated by a portal provider. The role of platform operator partially resides with the service providers, i.e. regarding hosting, and dealing with potential third parties. There is also room for a meta-platform operator in this particular model. Services outside of this meta-platform are also available to the user, but are not connected to each other. [5]

The meta-platform operator offers a container API, which allows developers to link different services together and exchange profile information for example. At the moment, this system is mainly a theoretical model, but it can be argued that Google has laid the foundations for such a system with its Open Social initiative. Right now it offers no more than the option to develop widgets that exchange information, but if expanded in the announced direction, such an initiative could mean true 'social network portability'.

Both Facebook and Google have recently joined the Data Portability Workgroup (Kirkpatrick, 2008), which strives for total data portability, allowing users to take their personal data from one website to reuse it on another. This may be interpreted as an illustration of fierce competition among platform providers to attract the largest numbers of users as well as developers is forcing them progressively to take down barriers for service development and use. [5]

As mentioned, this model draws its inspiration from regular web services and from the announcement of Open Social by Google in November 2007. Open Social offers a set of common APIs to service developers of mostly social networking software.

6. Paradigm Shift

The following section addresses the central theme of this paper, i.e. the ongoing shift from the conventionally dominant pipe model to the yet emerging platform business models. The exponential growth of internet across industries has been realized by companies as we see them restructure their business models in a way that involves the use of data for value creation. We are now evolving from linear to networked approach towards both startups and legacy systems.

In the recent past the commerce has flowed in a linear fashion with firms adding value to products and the customer's role as consumers. The word linear implies the flow of value created upstream and the goods produced downstream. There has been a clear distinction between the roles of producers and consumers.

However we are now in middle of a seismic shift in business models, powered by the internet and a generation of connected users. Many leading businesses are now developing platforms that connect diverse participants and enable them to both interact and transact. The distinction of roles as observed above is non-existent. The internet enables the users to be producers. Producers and consumers are now working in tandem to create both value and long-term networks referred to as ecosystems.

There are many factors leading to this paradigm shift ranging from ubiquitous network access further enhanced by the rise of smartphones and reputation mechanisms that promote trust among diverse users to the remarkably low cost already established shared infrastructure with the tools and data to capture and refine these interactions.

7. The Emergence of Ecosystems

As discussed above the platforms enable both value creation and building of long-term relationships referred to as ecosystems in the corporate world. In the past the market value of a company was determined by its net assets, however with the rise of platforms it is not the primary indicator of a company's market value. The value of modern age companies is determined by the size of its ecosystems. Firms that once sought advantage based on the strength of their resources and channel access now face competitors that harness armies of connected users and ecosystems of resources.

An analogy of EBay can help us better grasp the idea. The more buyers on EBay attract more sellers which in turn attracts more buyers. Such a feedback loop enables these businesses to grow massively. These businesses excel based on their capability to captivate third parties and connect them to each other through creative interactions. The rise of ecosystems has changed the linear commerce rules in various aspects. In operations, just-in-time inventory gets trumped by just-not-mine inventory. The IT function transforms from client server support to cloud service solution. In marketing, the profit maximizing price is often at or below zero. Charging every user can destroy network effects, yet data and network effects create critical competitive advantage.

There are many existing ecosystems; however the focus of this paper relies on mobile ecosystems. The mobile ecosystem is closely associated with platforms. The connection is subtle in nature as the rise of the

mobile industry has been instrumental in providing massive amounts of users with access to the internet thereby giving birth to a whole new marketplace i.e. "appstores". The mobile application stores have a large target audience and provide a canvas for intelligent marketing. The case studies ahead will elaborate further on the rise of mobile applications.

8. Ecosystems

Business world is full of Buss words and there is new buzzword on the block, "Ecosystem" that has perhaps a richer meaning than a particular business buzzword. The word finds its root in the biology where it describes a community of organism interacting with their environment. This can be analogized to business in the modern era as well where actors (Customers, markets, stakeholders etc.) form the species, relations between actors forms the network, strategies and behaviour of actors (Keystone, Physical dominator, Value Dominator, Niche Players) forms the roles and dynamics (Birth, Expansion, leadership etc.) form the evolution of the ecosystem.

The first one to introduce this analogy was the author James F. Moore (1993) in a popular award winning article in Harvard Business review. Moore emphasized that the modern business should not be looked upon as a single industry but rather a business ecosystem that crosses a variety of industries. This was soon followed by a book (Moore, 1996) that described ecosystem as "an economic community supported by a foundation of interacting organizations and individuals – the organisms of the business world" [Book, Page] The ecosystem includes customers, suppliers, competitors, and other stakeholders, who "coevolve their capabilities and roles, and tend to align themselves with the directions set by one or more central companies" [Book, page]. A more or less typical business ecosystem is depicted in Figure 1.

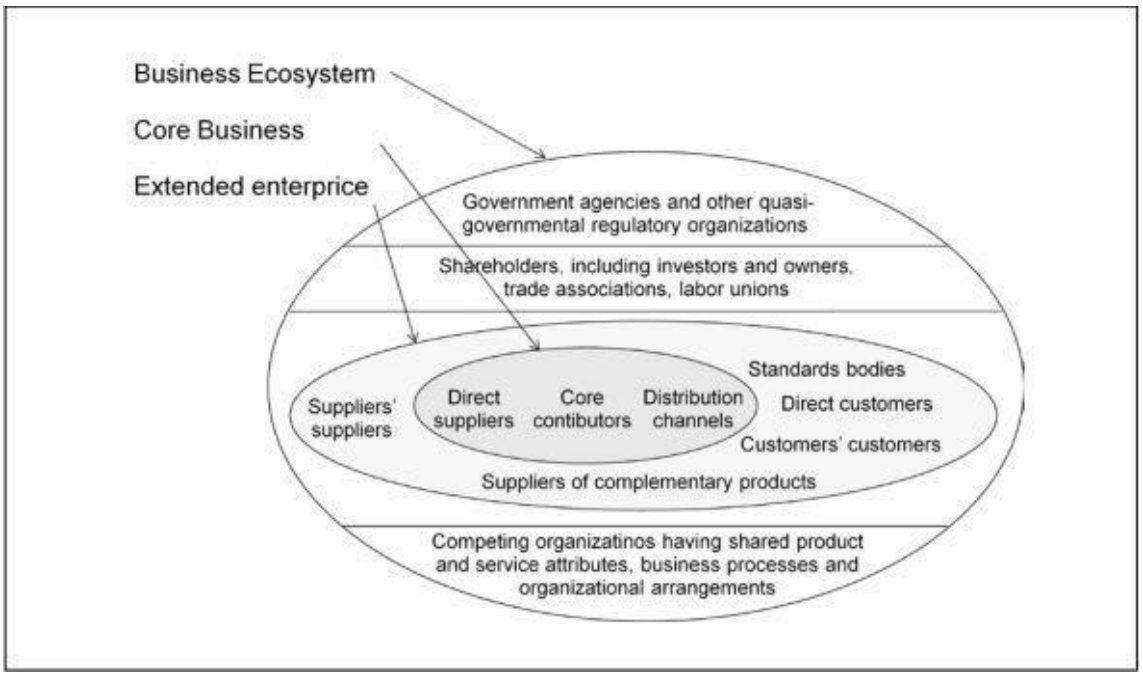

Figure1: Business Ecosystem (Moore, 1996)

Later scholars further developed this idea. Iansiti and Levien (2004a; 2004b) formulate the business ecosystem structure with the following species: keystones, dominators, hub landlords, and niche players. The

firms occupying influential hub positions (i.e., network nodes that are highly connected to other nodes) can adopt either a keystone role or a dominator role. Keystones exercise leadership to their own benefit, but also to the benefit of other ecosystem members. Keystones create platforms of services, tools, or technologies that other members of the ecosystem can use to enhance their own performance. Dominators instead adopt the short-term tactic of maximum value extraction, without attending to ecosystem health. Adner (2012) recently proposed a "wide lens" strategy toolkit for managers seeking to assess, build, or reshape ecosystems.

9. The Mobile Ecosystem

There is a mobile movement going on. The recent years have seen the rise in the global handset sales particularly in the smartphone domain which uses an operating system or a mobile platform to run a variety of applications. This resulted in mobile app ecosystems – iOS, Android, BlackBerry and Windows Phone giving rise to millions of apps. As a consequence, the legacy mobile operating systems like Symbian which were centred around the handset maker business model collapsed and new mobile app ecosystem-tem like android which were designed around the developer's business model became popular. As such, iOS, Android and Windows Phone are optimized to create and sustain demand from both users and developers.

Mobile industry has fitted very well into an ecosystem type of business (Basole, 2009; Tarnacha & Mait-land, 2006a; Peppard & Rylander, 2006). The ecosystem has been shaped due to the shaping of networks (Basole, 2009; Li & Walley, 2002) where a variety of firms from different segments are functioning and complementing each other to create value for customers. In research on mobile related issues, majority of researchers have taken the value chain perspective instead of business ecosystem perspective. By using the value chain perspective, researchers define the key functions and players that create value for end-users.

Karvonen & Warsta (2004) uses the value chain perspective in their model for ecosystem for mobile multimedia development (Figure 2). In their model, the participants of the ecosystem need to consider the operating system, terminals, development platform, and the network during the process of multimedia application development.

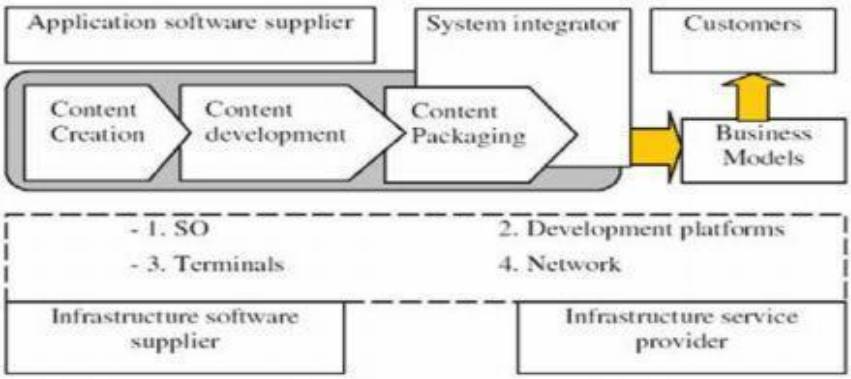

Figure 2: Ecosystem for mobile multimedia development

Basole (2009) adopts the business ecosystem approach for the beginning. He provides an illustration about the various segments in the mobile ecosystem (Figure 3). The dark circles represent the emerging participants whereas the light ones correspond to the existing participants. The major participants are device manufacturers, network operators, infrastructure providers, silicon vendors, platform providers, system integrators, software providers, application developers.

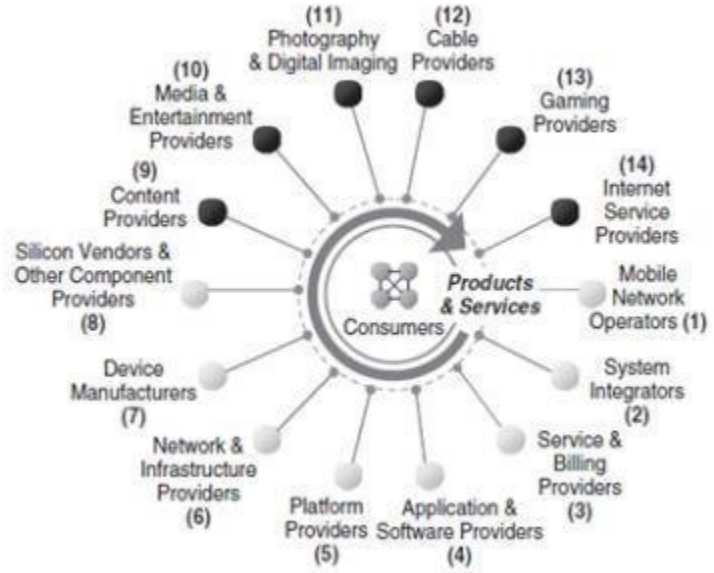

Figure 3: Segments in Converging Mobile Ecosystem (Basole, 2009)

9.1 Overview of the major stakeholders

The mobile industry is highly dynamic, volatile and fragmented. Each player in the ecosystem acts as a fragment. Compiling the work of various researchers on mobile application ecosystems and/or mobile value chains (Barnes, 2002; Karvonen & Warsta, 2004; Buellingen & Woerter, 2004; Tarnacha & Maitland, 2006a; Basole, 2009) the main participants in the mobile ecosystem and/or value chain are presented in Table 4, and listed as follows. Some authors have provided definition of the roles, while others have just used them on the basis of a common knowledge.

Actors	Description	Target Customers	Examples
Mobile Network Operator	Sets up the network and provides the consumers	End Users, Business application providers,	Swisscom, Vodafone, T-Mobil

	access to the network (Ibid)	virtual operators and ISP	
Mobile Operating System	Provides platform over which the hardware device functions	Network operators, device manufacturers and End Users.	Apple's iOS, Google Android, Symbian, Windows mobile, Blackberry
Mobile Application Developers	Packages the content into a mobile application for execaution on mobile devices (Ibid).	Mobile Network Operators (MNO), portals, manufacturers and consumers.	e iTerra, Geoworks, In-Fusio, Shockfish
Content Providers	Creates, aggregates and distributes mobile content	End user through direct distribution.	Media companies like Reuters
Original Equipment Manufactures	Manufactures information-processing mobile devices (Ibid)	Device Retailers, Network Operators distribution channel	Nokia, Erickson, Motorola, Samsung

Table 1: Participants of a Mobile Ecosystem

Following the importance of the applications in the new structure of mobile market and the introduction of app stores, Holzer & Ondrus (2010) study the mobile application market and emphasized on the role of the platform provider. Figure 4 illustrates the mobile application distribution process. In this process, the developer makes the application through the development tools offered by a specific platform, and publishes it on the application portal. The consumer, on the other side, purchases the application from the portal through his or her device. The payment stream goes from consumer to the application portal to the developer.

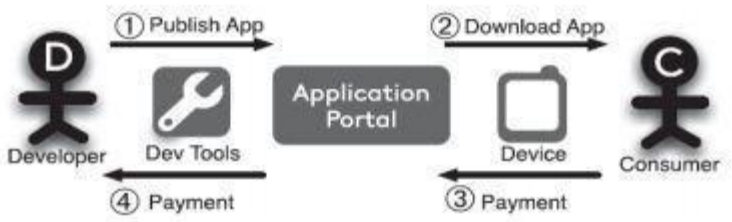

Figure 4: Mobile Application Distribution Process (Holzer & Ondrus, 2010)

10. Case Study

Here onwards the focus of the paper will be to study the app ecosystem and to show how early adoption of platform thinking have made them successful which is in compliance with the central theme of the paradigm shift happening and how companies in the mobile ecosystem are benefiting from it. The two cases discussed here are of Google Android Mobile platform Ecosystem and Apple iOS Mobile Platform ecosystem. Then these cases are evaluated on the key performance indicators

10.1 Google Android Mobile platform Ecosystem

This section will try to explain the dynamics of the Android mobile platform business ecosystem.

Figure 5: Structure of Google Android Platform Ecosystem

History: Google Launched its application store in 2008 [12] and was named as Android market. The term market was chosen to highlight the importance of the openness and obstructed environment for the developers. Android market was launched with the first Android-based mobile phone by HTC (i.e. HTC Dream aka T-Mobile G1) [12]. The users had the opportunity to access the Android market via any Android based Device or via internet. At its launch it contained 50 applications [12]. There are over 1,200,000 applications available as of June 2014, of which over 1,000,000 are free and 200,000 are paid.

Ecosystem Joining: A developer who needs to publish its application on the Ecosystem requires becoming a member of the Google play. The membership is done in two steps: signing the Android Market Developer Distribution Agreement, and a one-time payment. The agreement is available on the Website. Google does not prohibit its member developers from joining other ecosystems.

Application Development: Google provides the developers with all the necessary tools for developing and testing. Through the Android developer's website, the developers can have an insight to related articles, videos and tutorials for the app development and optimization of the tools. Android SDK is offered to developers for free. Developers need to first install the SDK Starter (which includes some core development tools) and then install the Android Development Tools (ADT) on top of it. ADT is a custom plugin for Java-based Eclipse environment.

Application Publication: Once the developer have developed the application. The application can be uploaded to the Google Play without any review. But the Google has the rights to remove any application. Cases of prohibited applications include but are not limited to: nudity and sexually explicit material, hate speech, malicious products, prohibited products (violating carriers' terms of service), and products that receive a report of abuse by consumers.

Revenue Generation: Google adopts a Revenue sharing model with developers and carriers. In case of the paid application Google does not hold any stake. The 70% of the share goes to the developer and the 30% to the carriers in this was Google just provides a platform. It also does not charge any fees form the developer for submitting the app either. The Google platform provides many means of revenue generation.

A) **Paid Apps:** At present the developers from 29 countries holds the rights to publish a paid app on the Google play [7]. The prize range determined by the developer based on the currency that the application is being sold in. For instance, the price range in US dollar is from 0.99 to 200 and in both Euro and Pound is from 0.50 to 100. The developer can set the price for the application in each currency

separately, or can allow the price to be converted by Google according to the exchange rate on the purchase day [7]

B) **In Apps Purchase:** This allows the developers to sell additional digital content along with the application. The consumers need to have the latest version of the Android in order to make in-app purchase.

C) **Ads:** Google's advertisement platform AdMobs allows developers to generate revenue through it. AdMob connects the companies who are interested to advertise their products and services to the developers who are interested to embed an advertisement in their applications. If the consumers click on the advertisement in an application, the Google will pay developer for it. AdMob works as a cloud space containing a mass of ads. Every time the application is run, AdMob pushes an ad to it. Google has connected its AdMob platform to its other advertisement networks. therefore, in case there is no possible ad on the AdMob at some point, an ad from other networks will be pushed to the application. As such, Google tries to always provide the developers with an ad in their applications, so that they have a higher chance to make revenue. [13]. As in the above figure it is clear that the Google provides a mobile platform 'Android' how the other stake holders come together to form the part of the ecosystem. The figure also depicts the role of each stake holder in the ecosystem and their interrelation.

10.2 Apple iOS Mobile platform Ecosystem

This section will highlight the key component of the Apple mobile platform ecosystem.

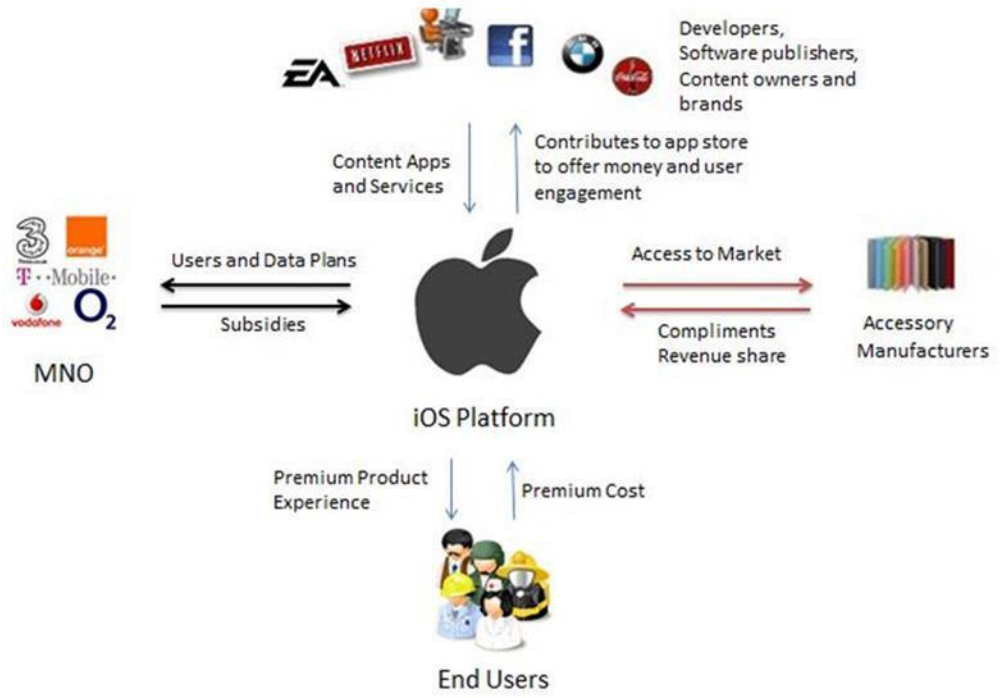

Figure 6: The structure of Apple iOS Mobile Platform Ecosystem

History: Apple launched its mobile application store in July 2008 under the name App Store. The launch of App Store was followed by the release of the iPhone 3G - a new generation of Apple mobile phones- a day later. App store is available for any 2 types of iOS based device iPhone (mobile phone), iPod touch (portable music player). App Store is built on top of iTunes Store (Apple's music store). Prior to the launch of App Store, iTunes Store contents were limited to multimedia; afterwards, iTunes Store was updated to include mobile applications

Ecosystem Joining: In order to publish an application on App Store, developers need to be a member of the iOS Developer Program. They can apply for membership through Apple's Developer Website. The membership process takes place in three stages: paying the membership fee, signing the iPhone Developer Program License Agreement, and the final approval by Apple. Apple does not prohibit the developers from joining competitors' ecosystem. The cost is $99 US/year for an individual developer and US 299 dollars/year for an enterprise

Application Development: The iOS SDK (Software Development Kit) is offered to developers for free. It is a comprehensive development environment that contains the XCode IDE which runs on Objective-C programming language. Developers can develop and debug applications on the XCode. The iOS SDK is allowed to be installed only on a Mac machine

Application Publication: Apple does not allow the applications to be directly published on App Store. Instead developers need to first submit the application for Apple review process. No estimation of the review process time is given by Apple. It can take from a week to a few months. Apple review process is known to be very "strict" and unclear

Revenue Generation: Apple practices a revenue sharing model with developers on the App Store. Basically, a developer can offer a free or paid application. Apple does not charge the application developer upon the publication of an application, but has a share in any type of revenue that the developer is generating though App Store.

A) **Paid applications:** The developers can decide a prize for their application within a range of US 0.99 dollars to US 999.99 dollars. Apple keeps 30 percent of the application sale revenue for each application and transfers the rest to the developer.

B) **in-App purchase:** It allows the developer to sell extra content through published application. A developer can sell newspaper subscriptions, extra game levels, or extra functionality for the ap-

plication. Apple introduced in-App purchase in October 2009. Similar to paid applications, 70 percent of the revenue from the sale of an application is transferred to the developer and 30 percents goes to Apple.

C) **iAd:** iAd is a mobile advertising platform for integrating banner-type advertisement into an application. When a consumer taps on the banner, a full-screen advertisement opens and Apple charges the advertiser for US 2 dollars, plus US 10 dollars for every 1000 views. The application developer receives 60 percent of Apple's earnings from each advertisement.

11. Analysis and Discussions

The triumph of iOS and Android is a testament to the superiority of ecosystems economics over legacy business models. Both Google and Apple built successful mobile app ecosystem which was in accordance with the paradigm shift explained earlier in the paper. Their early realization of this shift helped them to attain the prominent position which in turn has led to the Apple-Google duopoly in the Mobile Ecosystem economies. The basis for the ecosystem economy is the network effects. By connecting users to developers, ecosystems create network effects, that is, they drive demand between users and developers: the more users, the more handsets, and therefore the more developers, the more apps and so more users. Though we are convinced that ecosystem economics dictate the power play in mobile app ecosystems but the nature and the mechanics of such economics are not well understood. Understanding and quantifying ecosystems economics is the key to understanding the competitive landscape of today's app economy, assessing the value of an ecosystem and making informed decisions regarding the long term viability of platforms and the investment opportunity for developers, enterprises, handset OEMs, network operators and consumers.

11.1 Ecosystem Performance

Once in a while Apple and Google announce app-store data such as apps available, downloads, activations and money paid to developers to highlight their dominant position in the market.

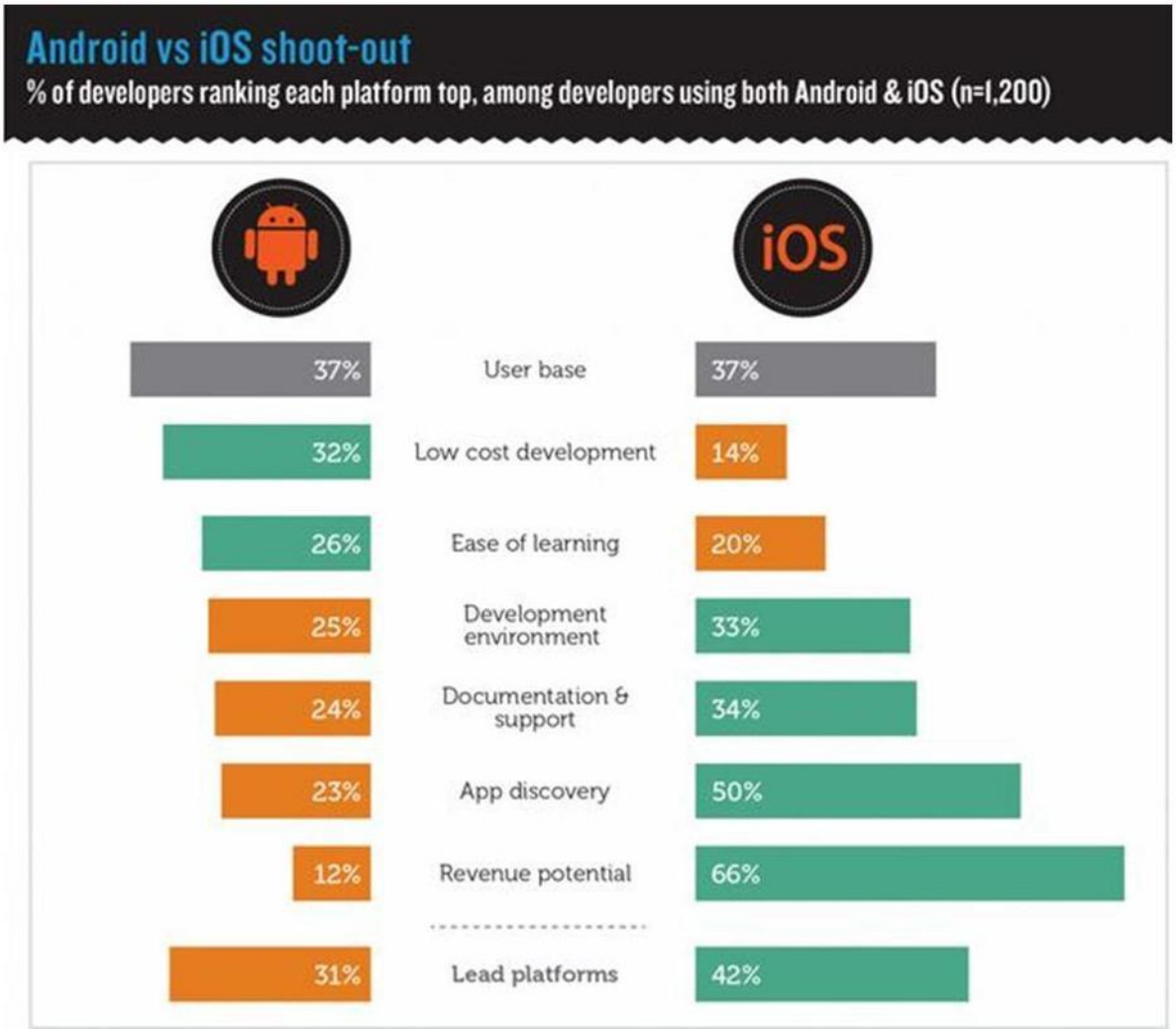

Figure 7: Performance Metrics for Android and iOS App Ecosystem

Such metrics provide a glimpse of ecosystem performance and provide a great service as marketing messages for headline generation. But how important is all this data to ecosystem stakeholders? How are we to assess whether platform A is in a better position than platform B and what momentum each platform carries going forward?

11.2 Deriving Platform Value

There are certain key performance indicators for deriving the value of the platform. Table 2 illustrates the prominent among them. These KPI are important to the health and viability of an ecosystem and we have compared two major platforms along these KPIs. While monetization is better on iOS, developer mind-share is higher on Android, suggesting that reach is more important than revenue. At the same time, developers on iOS earn $7.4 per million users while developers on Android earn just $2.11 per million us-

ers, suggesting that developer value increases much faster on iOS than for Android for each new user added.

Platform KPI's	Android	iOS
User reach	688 Million	254 Million
Developer Mindshare	72%	56%
Total Apps	>800 Thousand	846 Thousand
Revenue per million Users	$2.11	$7.4
App Downloads	~20 Billion	~18 billion

Table 2: Source: www.digitaleconomies.com

12. Conclusion

Platforms have become a core feature of many emerging business models and are particularly important in the mobile industry. The success of the platform depends upon the Platforms have become a core feature of many emerging business models and are particularly important in the mobile industry. To act on platform opportunities few factors have to be considered. The roles of producers and consumers need to be revised for inculcating a platform approach. The APIs need to be more user-oriented to maximize user interactions thus leading to the growth of ecosystems.

The paradigm shift of business models has resulted in paradigm shift of marketplace too, hence their needs to be a clear distinction to avoid failures. The firms need to invest more on e-commerce endeavours as it is the future of modern day businesses as we know it. The cheap and already existing network infra-structure is an asset that needs to be capitalized via innovative tools to manage vast amount of user data and build stable and long-term ecosystems to ensure growth and value creation.

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