Mobile 2.0: Strategies for Operators in an Open Mobile Ecosystem

Telecom & Media Insights
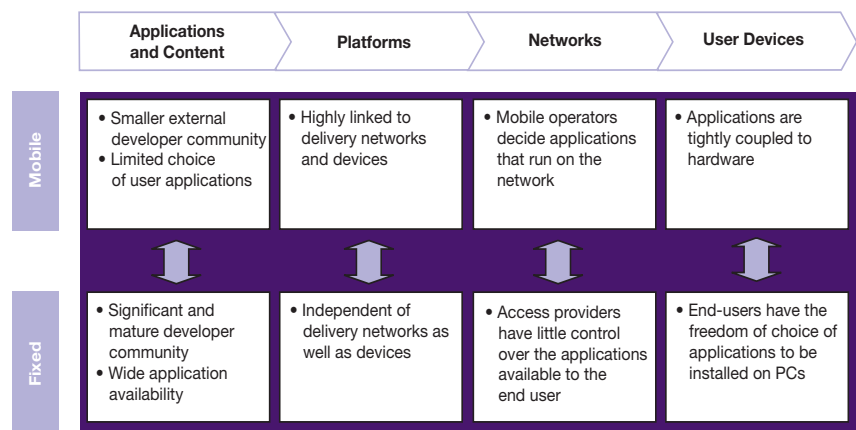
Issue 29, August 2008

Contents

1   Abstract

The mobile ecosystem has historically been a closed system with little choice for end-users when it comes to applications and services on handsets. However, recent initiatives by various players in the mobile value chain seem to suggest that these closed ecosystems are soon going to be a thing of the past. Online players such as Google are coming up with open platforms that seek to create a level playing field for all players by ensuring that preferential and discriminatory treatment of applications and services is done away with. Moreover, the emergence of device players as "service providers" is making a wide range of applications available to end-users with little intervention by telcos. These developments are directly impacting operators' ownership of the consumer and their service delivery experience. Capgemini has identified three broad strategic options for operators in the evolving open mobile landscape. It is our recommendation that operators position themselves as platforms for delivering a wide range of third-party and self-developed applications, and adopt a "compete-in-some, collaborate-in-some" model with third parties. Operators should open up network APIs, build common content platforms in collaboration with online players, and also partner with device vendors for mutual benefit. Operators who adopt this platform strategy are likely to see maximum revenue uplift, without ceding a significant amount of control over the customer.

2 Introduction

The mobile industry has remained a closed ecosystem where operators control almost all aspects of the consumer experience. This is in direct contrast to the fixed PC and Internet world where access providers have had little control over the applications that are consumed by the end-user. Fixed Internet thrives in its open nature, spawning an entire ecosystem of application developers and service providers. On the contrary, in the mobile space service innovation has historically been limited to initiatives led by the operator, and third party application providers have little direct access to end-users. Moreover, the development process and the application itself are closely tied to the hardware specifications of the device and technical features of the operators' network, thereby restricting reuse of applications and/or platforms across device categories and operators (see Figure 1).

Figure 1: Key Differences between Fixed and Mobile Ecosystems

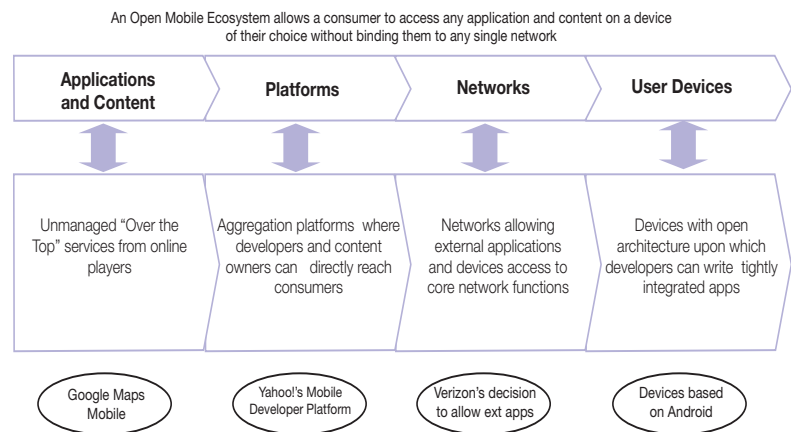| Applications and Content	Platforms	Networks	User Devices
Mobile			
• Smaller external developer community • Limited choice of user applications	• Highly linked to delivery networks and devices	• Mobile operators decide applications that run on the network	• Applications are tightly coupled to hardware
Fixed			
• Significant and mature developer community • Wide application availability	• Independent of delivery networks as well as devices	• Access providers have little control over the applications available to the end user	• End-users have the freedom of choice of applications to be installed on PCs

Source: Capgemini TME Strategy Lab Analysis

Recent industry announcements, however, promise to change the mobile ecosystem by mitigating some of the controls at each stage of the value chain.

Companies such as Nokia and Google have launched multiple "over-the-top" services that directly interact with the end-user. Online players are strengthening their capabilities to target mobile users directly by launching application platforms. For instance, Google has introduced *Android*, an open source mobile platform that marks a significant shift from the proprietary platforms and operating systems that dominate the industry. Consumer demand and initiatives

from challenger operators seem to also have had an impact on mobile operator strategies. In Europe, operators are adopting open access in contrast to their erstwhile "walled garden" strategies, and providing users access to a set of external applications. Similarly, in the US, Verizon Wireless has announced that it will open its network to external applications and devices[1]—a significant shift from its policy so far—to restrict applications and devices that run on its network. These developments appear to point towards an open mobile ecosystem at each stage of the value chain (see Figure 2).

Figure 2: Definition of an Open Mobile Ecosystem

An Open Mobile Ecosystem allows a consumer to access any application and content on a device of their choice without binding them to any single network

Applications and Content	Platforms	Networks	User Devices
Unmanaged "Over the Top" services from online players	Aggregation platforms where developers and content owners can directly reach consumers	Networks allowing external applications and devices access to core network functions	Devices with open architecture upon which developers can write tightly integrated apps
Google Maps Mobile	Yahoo!'s Mobile Developer Platform	Verizon's decision to allow ext apps	Devices based on Android

Source: Capgemini TME Strategy Lab Analysis

In this paper, Capgemini analyzes the factors that are leading to an open mobile ecosystem, and evaluates key strategies for telcos to benefit from it.
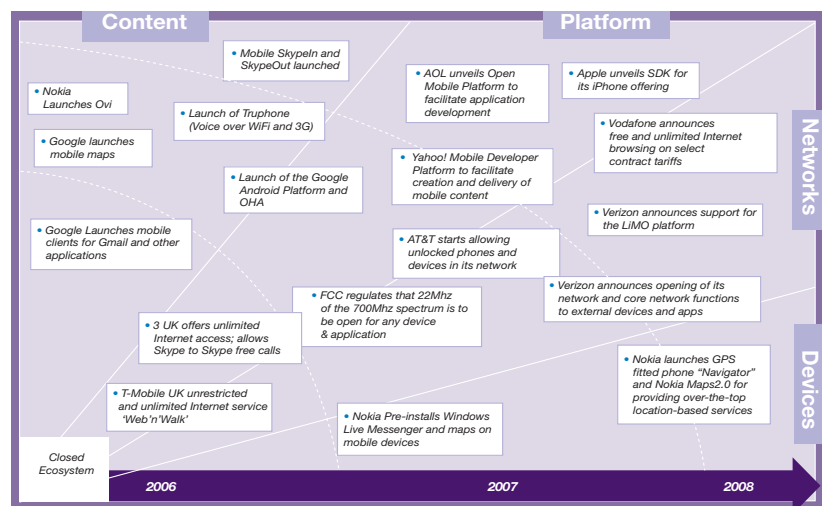
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1 AOL News, "Verizon Will Open Network to All", November 2007.

3 Evolution to an Open Mobile Ecosystem

The mobile ecosystem is slowly, but definitely, changing in the way it has traditionally operated. Initiatives that have been taken by various players seem to suggest that the ecosystem is likely to undergo a transformation that it has not been seen in years (see Figure 3). The pace of these changes has been steadily increasing as more players embrace the philosophy of opening up networks and access.
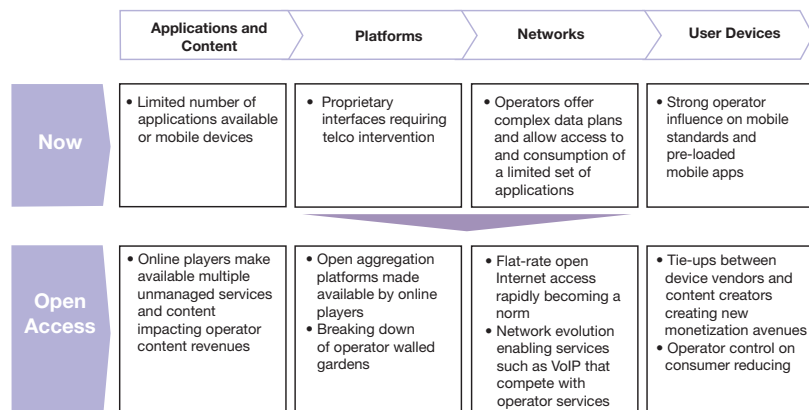
Figure 3: Recent Initiatives Leading to an Open Mobile Ecosystem

Source: Capgemini TME Strategy Lab Analysis. Company Websites and News Releases

In this section, we analyze trends towards openness across the value chain (see Figure 4).

Figure 4: Changes Happening Across the Value Chain

	Applications and Content	Platforms	Networks	User Devices
Now	• Limited number of applications available or mobile devices	• Proprietary interfaces requiring telco intervention	• Operators offer complex data plans and allow access to and consumption of a limited set of applications	• Strong operator influence on mobile standards and pre-loaded mobile apps
Open Access	• Online players make available multiple unmanaged services and content impacting operator content revenues	• Open aggregation platforms made available by online players • Breaking down of operator walled gardens	• Flat-rate open Internet access rapidly becoming a norm • Network evolution enabling services such as VoIP that compete with operator services	• Tie-ups between device vendors and content creators creating new monetization avenues • Operator control on consumer reducing

Source: Capgemini TME Strategy Lab analysis

3.1 Increasing Availability of Unmanaged Applications

Online players are looking at replicating their successful ad-supported business model in the mobile space, which has hitherto seen subscription-based models. These players are looking to tap into a portion of the global mobile advertising market, which is estimated to be $10bn[2]-$19bn[3] by 2011. Currently, unmanaged services from online players include Google Maps, Yahoo! Go, and Gmail. VoIP players such as Skype have also entered this market with Java-based clients that can be used for making calls at low rates.[4] New players such as Nimbuzz have launched integrated instant messaging services that combine mobile VoIP with IM and file-sharing.[5] Over the years, such applications are expected to become more comprehensive in their offerings and include mature VoIP/SMS services, video calling and mobile shopping platforms.
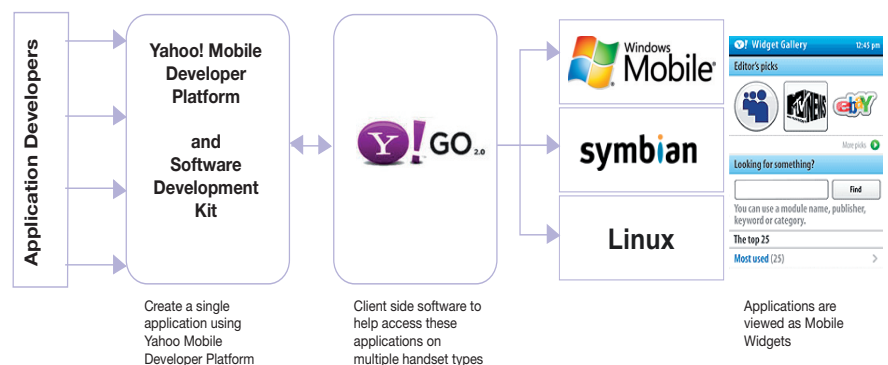
3.2 Advent of Multiple Device/Network Agnostic Platforms

While mobile advertising offers significant growth potential, online players will need to surpass formidable barriers. They need to work around the issue of hardware diversity in the mobile devices space, which makes customizing applications a challenging task. For instance, today, there exist over twenty major handset manufacturers developing hundreds of models on over six different platforms that include Symbian, Windows, Apple, and many other proprietary platforms. Similarly, adapting applications to different classes of browsers with different capabilities, and collaborating with multiple stakeholders also leads to significant delays and cost in making a service available to a wide mobile audience. It is estimated that the cost of porting an application to each handset platform often amounts to as much as 60-80% of the actual development cost.[6]

To overcome limitations that arise due to platform and device diversity, online players are looking at setting up open platforms that are built ground-up with the specific objective of enabling wider availability of online services.

Online players' standardized platforms seem to be the early steps towards an open ecosystem. As an example, Yahoo! has launched its Mobile Developer platform, consisting of middleware, device client and a Software Development Kit (SDK). The initiative is aimed at enabling developers and publishers to take their services quickly across multiple device models without incremental costs of development. The SDK can be used to write code "once" and efficiently publish applications and content across hundreds of devices[7] (see Figure 5).

Figure 5: Architecture of Yahoo! 'Mobile Developer Platform'

Create a single application using Yahoo Mobile Developer Platform

Client side software to help access these applications on multiple handset types

Applications are viewed as Mobile Widgets

Source: Capgemini TME Strategy Lab Analysis. Company Website

2 Stanford Group Company, "Google Inc", November 2006.
3 ABI Research, "Mobile Marketing and Advertising to be Worth $3 Billion by 1Q 2008", April 2007.
4 Skype, "Skype Tests Software for Mass-Market Mobile Phones", April 2008.
5 Washington Post, "Nimbuzz - VOIP/IM aimed at mobile and social networks", May 2008.
6 AOL, "Open Source Technologies: Powering the Mobile Experience – the AOL Perspective", March 2008.
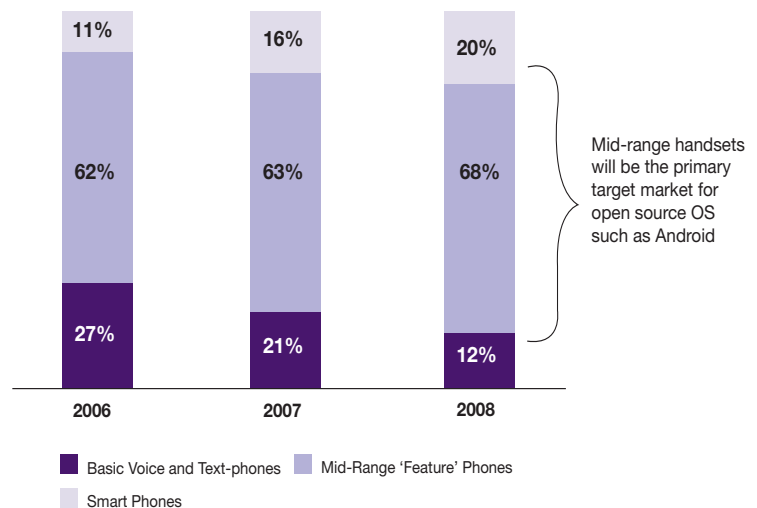7 Information Week, "Yahoo CEO Jerry Yang: The Mobile Web Needs Openness", January 2008.

While Yahoo!'s initiative aims at creating an OS and device agnostic aggregation platform, Google has announced the launch of a full-fledged software stack including an operating system, middleware platform, development toolkit and key applications. The Android initiative was announced in November 2007[8] and consequently an update of its SDK was released in February 2008.[9] Google has also facilitated the creation of the Open Handset Alliance (OHA), drawing in a number of handset manufacturers, operators and application developers to create an ecosystem that promotes wider availability of applications to end-users. The Android OS is expected to be available for free[10], and consequently device manufacturers stand to gain an immediate advantage as software costs typically make up between 10-20% of the total handset manufacturing cost.

Moreover, by ensuring that Android can run on low-end processors[11] (at speeds of 200 MHz), and yet deliver rich applications, Google is looking to tap the growing mid-range handset segment (see Figure 6), thereby reaching a wider audience.

Figure 6: Mobile Handset Shipment Market Share Based on Type of Handset, Global, 2006-2008

Mid-range handsets will be the primary target market for open source OS such as Android

Legend:
- Basic Voice and Text-phones
- Mid-Range 'Feature' Phones
- Smart Phones

	2006	2007	2008
Smart Phones	11%	16%	20%
Mid-Range 'Feature' Phones	62%	63%	68%
Basic Voice and Text-phones	27%	21%	12%

Source: Haywood Securities Inc, "Intrinsyc Software - The Right OS at the Right Price", November 2007

In addition to these initiatives, AOL has announced an open mobile development platform, while other initiatives that were started earlier such as the LiMo foundation are gaining more traction with recent announcements. For instance, LiMo received a boost in its efforts with Verizon Wireless' recent announcement of its decision to support it.[12] The current industry fragmentation surrounding such common platforms is likely to give way to a scenario where there are few dominant platforms. These platforms will ensure that the much needed standardization becomes a pervasive reality.

3.3 Operator Response to Consumer and Competitive Pressures

Historically, third-party application and service providers were limited in their reach of consumers due to inherent limitations of the networks. However, mobile network technology has evolved significantly in the past few years and is expected to continue evolving to offer higher speeds and lower data carrying costs. Network evolution to High-Speed Downlink Packet Access (HSDPA), which offers up to 1 Mbps throughput, is eliminating some of the earlier technical constraints faced by unmanaged services such as VoIP. Evolution of network technology to

8 CNET News, "Google launches its cell phone ambitions", November 2007.
9 TG Daily, "Google pumps out updated Android SDK", February 2008.
10 The Android OS kernel is expected to be distributed under an open-source licensing model.
11 PC Mag, "Hands-On Android Demo", February 2008.
12 Business Week, "Verizon Snubs Google's Platform", May 2008.

High-Speed Uplink Packet Access (HSUPA), which offers average uplink speeds of 600 kbps and beyond is likely to ensure that technical hindrances to deployment of unmanaged services are removed. These advances in network technology are likely to encourage consumers in increasing their usage of mobile Internet.
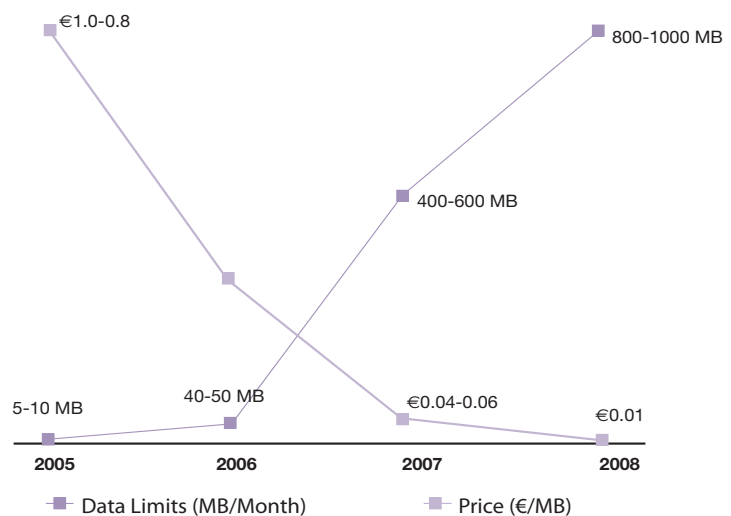
Increasing Consumer Interest Towards Near-PC Experience on Mobile
Consumers increasingly want seamless access to their favorite online services that they have been accessing via the PC, on their mobile phones as well. For instance, the top three websites accessed on Vodafone mobile Internet in the UK are Facebook, Google and BBC.[13] Similarly, NTT DoCoMo's data traffic trends clearly show that operator "walled gardens" no longer find favor with consumers. Over 70% of NTT DoCoMo's *i-mode* traffic is generated by consumers accessing non-official sites.[14] Going forward, it is likely that consumers will want to treat the mobile Internet as an extension of its fixed counterpart and browse their favorite sites, disregarding operator owned portals. Such developing consumer browsing patterns are likely to impact operator choice of ecosystem.

Operators are Introducing Open Internet Plans
Operators are responding to the growing data needs of consumers by coming up with flat-rate plans. For instance, in the UK Vodafone and 3 have announced that they will be offering flat-rate data plans providing unlimited usage to the consumer within fixed monthly data limits (see Figure 7).

Figure 7: Evolution of Price per MB of Mobile Data Traffic, UK, 2005-2008

Source: Capgemini TME Strategy Lab Analysis. Operator Websites

Operator flat-rate plans also come with restrictions in place. For instance, Vodafone in UK does not allow VoIP, IM, P2P[15] file sharing, and using the phone as a modem in its flat-rate plans.[16] However, going forward, it is likely that true flat-rate pricing with minimal restrictions on network usage will be in place. Flat-rate pricing has also led to a steep fall in the absolute cost of data. For instance, in Italy, the cost per MB of mobile data has fallen from €0.04 in 2006 to €0.01 by 2007. Similarly, in Germany, price per MB has come down from €0.33 to virtually zero, due to the enhanced data traffic limits.

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13 Vodafone, "Unlimited Internet Access on Vodafone's New Monthly Price Plans", May 2008.
14 Telecoms Magazine, "Walled gardens come tumbling down", August 2007.
15 Peer 2 Peer, a system of direct connectivity between two consumer devices.
16 Forrester, "Mobile Internet Pricing Strategies Mature", July 2007.

Operators are Opening Networks to External Devices and Application
While most operators are coming up with flat-rate data plans to encourage active uptake of mobile data services, a few are realizing the customer demand for greater access to their favorite applications and online content, and responding to the same. For instance, in the US, operators such as Verizon Wireless and AT&T have announced that they will be opening their networks to external devices and applications (see Figure 8). While this may imply erosion in control of the consumer experience, operators are leaning towards opening their networks in search of a first-mover advantage. By opening their networks, operators are addressing competitive and regulatory pressure as well as customer concerns.

Figure 8: Key Features of Open Access Initiatives of Verizon and AT&T

	verizon Nov (2007)	**at&t** Dec (2007)
Applications and Content	Users can access any application; however is likely to have fair usage limits with data plans	Users can download most applications; however certain applications such as Skype will continue to be blocked
Open Devices	Any device will be allowed: whether portable game console, credit card terminals or music players	Any GSM device will be allowed on the network; but certain functions on subsidized handsets will be disabled
Access to Network Functions	Developers will have access to network functions, such as GPS, MMS, SMS and VCast portal content	Developers have access to security functions and messaging gateways
Quality Control	Operator will test and certify the device for use on its network to avoid handsets that can potentially pose threat to security	Developers need to submit their applications to AT&T for testing before it decides to include them in its network

Source: Capgemini TME Strategy Lab Analysis. Company Websites

In the coming years, consumer demand towards a seamless Internet experience is only likely to grow stronger. It is also likely that more operators will actively consider a shift to open platforms, driven by a combination of consumer, competitive and regulatory pressures.

3.4 Open Ecosystems Facilitated by Device Development
Device development has advanced significantly in recent years to catch up with the proliferation of advanced mobile services. Device capabilities in the three core areas of processing power, storage capacity and battery life have been increasing rapidly. A case in point is the Apple iPhone available with storage of 16GB, a healthy battery life and a powerful 400 MHz processor that runs an advanced operating system (OS-X) on the phone.[17] Device manufacturers are recognizing the shift to open ecosystems and participating actively in it. Nokia has released an application development tool for its Series 60 based phones that run on specific chipsets from Texas Instruments. Similarly, Apple has released a software development kit that enables external developers to write applications for the iPhone. Such toolkits help in simplifying the process of simulation, testing and porting applications for the developer community.

Going forward, advances in devices, enabled by open architectures and public software development kits, are likely to ensure a significantly integrated user experience. Alongside, declining costs of electronic hardware and entry of open platforms such as *Android* will ensure that even entry-level mobile devices have a rich set of base features.

These developments will have a significant impact across the value chain as it gradually opens up, operators will start experiencing tangible loss of control over the customer service delivery experience.

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17 Tech Radar, "Apple iPhone-Our Review", November 2007.

4   The Road Ahead for Mobile Operators

The emergence of an open mobile ecosystem is posing new challenges for operators in terms of their strategic positioning in the value chain. Operators may need to forego their control over the value chain, and adopt an "open" strategy allowing a wide range of external applications and devices over their networks. One of the foremost issues facing most operators is whether they should allow external applications and devices on their networks, and provide them access to core network functions; and if so, how to mitigate the risks associated with adopting an open strategy. Operators need to understand this new context that they are operating in and redefine their role. Capgemini has identified three possible positioning choices for mobile operators (see Figure 9).

Figure 9: Possible Strategic Positioning Choices for Mobile Operators

	Applications and Content	Platforms	Networks	User Devices
Open Network Access	• All external applications allowed; no operator role in provisioning and billing	• Third party aggregation platforms with no operator control	• Operator offers best effort and application agnostic access	• All external devices are allowed
Differentiated Network Access	• Operator involvement in provisioning of certain applications to the end-user	• Third party aggregation platforms; operator may participate to co-develop the platform	• Operator offers prioritized access to certain applications	• Handset subsidies provided to subscribers of premium service pipes
Telco Platform	• 3rd party applications are allowed along with telco content and applications	• Operator offers service enablers' platform with open APIs, a development toolkit and hosting and billing functions	• Operator will prioritize services across its networks based on subscription and service type	• Only certified handsets are allowed

Extent of Operator Control (High to Low) ▮▮▮▯
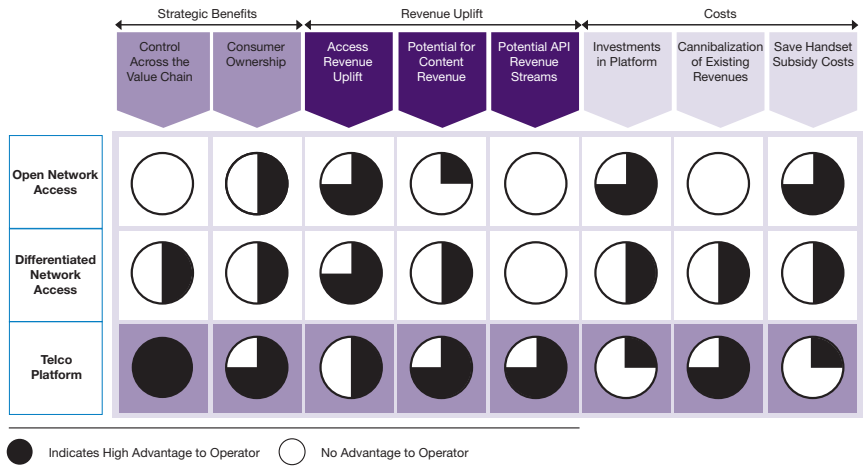
Source: Capgemini TME Strategy Lab Analysis

4.1 Possible Options for Mobile Operators
With these positioning choices, operators have three associated options (see Figure 10).

Open Network Access
The "Open Access" option is the most straight-forward of the three options, and is analogous to the role of an Internet service provider in the fixed space where operators offer application-agnostic network access that supports all kinds of applications and end-user devices. The operator extends its access network to all third-party "over-the-top" services and plays no role in provisioning or billing of external applications. The operator also stays away from participating in content and application development or creating aggregation platforms for external content. Operators opting for this strategy will allow most external devices on the network with minimal subsidies.

Figure 10: Comparison of Operator Benefits from the Various Strategic Options

	Strategic Benefits		Revenue Uplift			Costs		
	Control Across the Value Chain	Consumer Ownership	Access Revenue Uplift	Potential for Content Revenue	Potential API Revenue Streams	Investments in Platform	Cannibalization of Existing Revenues	Save Handset Subsidy Costs

Indicates High Advantage to Operator ●   ○ No Advantage to Operator

This is a strategy that enables operators to have revenue upside from the increased usage of data services, by ceding significant amount of control across the value chain to online players and third party developers. The strategy does not entail any costs to acquire or develop content, or to create and manage the aggregation platform. However, this strategy also leaves holes in its monetization potential by neglecting areas such as content revenues. Open access can also pose a threat of cannibalization of existing revenue streams of operators, especially in voice and messaging by third-party "over-the-top" communication services.

Differentiated Network Access
With the "Differentiated Access" strategy, operators go a step further from playing the role of an application-agnostic access provider, by creating distinct service pipes priced at different levels for the end-user. Operators can offer multi-tier access plans, which users could choose from depending on the applications they wish to consume. For example, subscribers who wish to use mobile Internet only for browsing and other basic Web applications can choose a low-priced basic data plan which blocks VoIP and bandwidth-intensive applications such as video streaming; while users who wish to access a wide range of advanced services such as VoIP, over-the-top video and file sharing could buy a premium data subscription.

At the same time, the operator also partners with specific online players in introducing services that come with a guaranteed level of Quality of Service (QoS), and are much more integrated with operator offerings. Operators then take a proactive role in managing such services by taking care of issues such as handset integration, billing and customer service, and sharing any consequent revenue uplifts with the online player.

This strategy offers significantly more options for revenue uplift than what "Open Access" offers. By tying up with online players in building advanced services, operators ensure that the extent of control over the customer experience that they cede is matched by a corresponding rise in access and content revenues. Moreover, operators also reduce the risk of possible cannibalization that some services could have on their core revenues.

"The advent of open ecosystems will result in a definite erosion of operator control over the customer experience"

Telco as a Platform

The "Telco Platform" strategy presents a significant shift in the way current networks operate. Operators adopt a "compete-in-some, collaborate-in-some" model with regards to applications and content. Operators partner with third-party application developers and content players, whilst also offering their own portals to consumers. Third party applications are granted full access to network features, while being kept under the ambit of a fair usage policy. Operators offer APIs to help third party developers build services around core network features such as voice, messaging, user authentication, location and presence. Operators can also provide billing and hosting platforms for third-party applications and content. In doing so, operators not only mitigate the risks of their "on-deck only" strategy, but also open themselves up to gaining richer customer insights. Operators also have the option of working with handset manufacturers in customizing their devices to ensure easier access to content and applications from the operator as well as its partners.
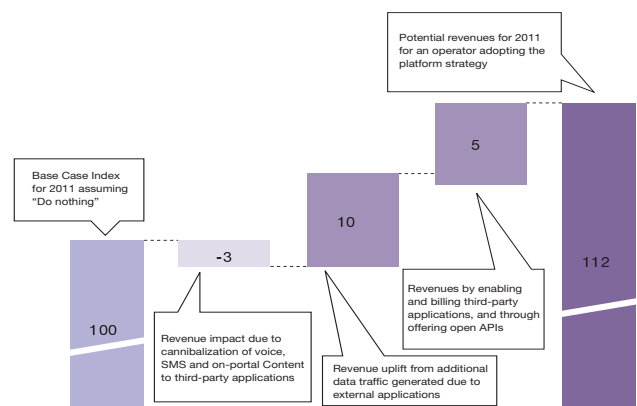
This strategy not only offers scope for significant revenue uplift, but also retains operator control over a significant part of the consumer service delivery experience. By working in close association with content and application providers in identifying and monetizing newer revenue streams, operators stay at the forefront of innovation in the mobile ecosystem. However, operators will need to invest significant resources in building capabilities around platforms and developer communities.

4.2 Benefits of Adopting the Platform Strategy

Of the three strategic positioning choices that operators have before them, the platform strategy offers maximum revenue uplift, without ceding significant strategic control over the value chain. While there are investments involved in embracing this platform fully, these costs are imperative to position operators strongly in the value chain as "service enablers" for the mobile platform, in contrast to reducing them to simple utility providers.

Our estimates indicate that an operator in the UK with a market share of 20% could look at a net revenue uplift of 12% by 2011, by carefully adopting the platform strategy after considering any possible erosion of core revenues by over-the-top services (see Figure 11). A significant portion of these revenues could come from data traffic uplift driven by a rich suite of third-party applications available on the operator's open platform. In addition to access fees, operators can accrue a 5% revenue uplift from billing of third-party applications and by providing open APIs for authentication and location information for end-users.

> "Operators should position themselves as platforms that enable delivery of applications and content without discrimination"

Figure 11: Potential Revenues in 2011 for an Operator Adopting the Platform Strategy (Assuming an Index of 100 basis points)

Potential revenues for 2011 for an operator adopting the platform strategy

Base Case Index for 2011 assuming "Do nothing"

100

-3

Revenue impact due to cannibalization of voice, SMS and on-portal Content to third-party applications

10

Revenue uplift from additional data traffic generated due to external applications

5

Revenues by enabling and billing third-party applications, and through offering open APIs

112

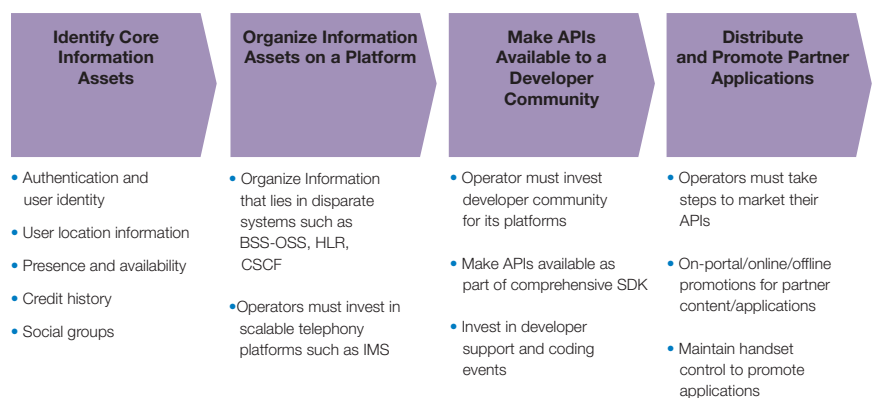Source: Capgemini TME Strategy Lab Analysis

However, these revenue streams are only indicators of the possible value operators could unlock, as they can also leverage the vast authentication and location information to tap the high-growth mobile advertising opportunity, both through direct advertising as well as third-party partnerships.

4.3 Recommendations for Telcos

We believe that leading mobile telcos in Europe should open their networks to third-party applications and content, and allow a wide range of external devices on their networks. Operators should create platforms around their unique assets, and add value to the user experience by enabling and delivering external content and applications.

For most telcos, this will require consolidation of their core data assets related to subscribers such as demographics, authentication, credit information, usage patterns and social networks. Such information is often spread across disparate systems acquired over time, and is often available in non-standard or proprietary formats that cannot be directly used by applications. Operators will need to make open APIs available to the external developer community for location, presence, authentication and other data repositories (see Figure 12).

> "Operators need to clearly understand the risks and rewards of open ecosystems and adapt accordingly"

Figure 12: Key Initiatives towards Developing a Telco Platform

Identify Core Information Assets	Organize Information Assets on a Platform	Make APIs Available to a Developer Community	Distribute and Promote Partner Applications
• Authentication and user identity • User location information • Presence and availability • Credit history • Social groups	• Organize Information that lies in disparate systems such as BSS-OSS, HLR, CSCF • Operators must invest in scalable telephony platforms such as IMS	• Operator must invest developer community for its platforms • Make APIs available as part of comprehensive SDK • Invest in developer support and coding events	• Operators must take steps to market their APIs • On-portal/online/offline promotions for partner content/applications • Maintain handset control to promote applications

Source: Capgemini TME Strategy Lab Analysis

Towards this, operators should plan a clear roadmap for deployment of technologies such as IP Multimedia Subsystem (IMS), which abstracts the application layer from networks, and creates open interfaces that allow core information to be made available to applications in a standardized manner. Operators will also need to take steps to promote their platforms amongst the external developer community. Some operators such as Orange have already launched initiatives such as the Orange Partner Program to attract third-party developers.

In conclusion, the mobile industry is bound to see a major disruption with the unshackling of operator controls over the development and delivery of applications. These changes threaten to bypass those that choose to ignore them and reward those that welcome them. Operators and other stakeholders alike would do well to adapt themselves to these changes in order to ensure that they stay relevant in the new mobile world order. Operators are best positioned to play the role of enablers, by unlocking their network and data assets to third-parties, and in the process, creating value in terms of additional revenues. Operators will need to plan a clear roadmap in transforming themselves from delivery players to platform providers.

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