

## The Promises and Pitfalls of Open Mobile Platforms

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The communications industry is experiencing unprecedented change. Intense competition, consolidation, margin pressures and having to invest in new technologies is driving the need for new ways to improve efficiency and scalability, while achieving a fundamentally lower cost structure. At the same time, consumers have become far more discriminating about their services and devices (often called the "iPhone effect"), user experience trumps technology and price as the key driver behind purchase and adoption. One of the main catalysts for improving user experience is the shift to mobile platforms that leverage such open source community software as Google Android, Linux Mobile (LiMo), and Symbian.

The promise of open mobile platforms is compelling: better subscriber experience, more money for carriers and a bonanza of new applications. In other words, the walled-garden view of the Internet is tumbling down.

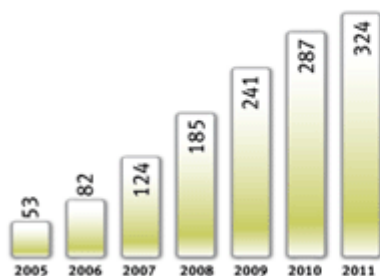
The business model is also compelling for ecosystem participants. In such countries as India and Africa where PC penetration is still considerably low, the mobile phone is becoming the ubiquitous device for Internet access. This shift in usage resulted in the rapid development of new applications including electronic payments, ticket reservations and mobile banking.

However, with all of the promise, the emerging open mobile ecosystem faces a number of challenges, including security, interoperability and diverging next-generation technologies. This article will cover the relative strengths of open source mobile technology, anticipated barriers to growth, and how the entire mobile community, including carriers, handset manufacturers, application developers and component providers, must adopt a holistic approach to allow the open source mobile revolution to realize its greatest potential for success.

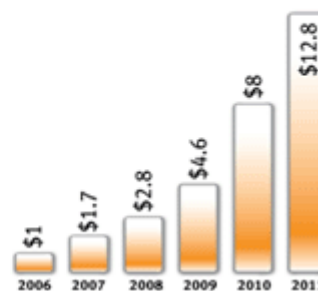
### The Current Landscape

In 2011, smartphone shipments are expected to exceed 320 million, with mobile advertising revenue poised to explode to almost \$13 billion from less than \$2 billion in 2007. One analyst forecasts mobile data revenues will increase by a compounded annual growth rate of 16 percent from \$24 billion in 2007 to over \$100 billion in 2017.

Worldwide Smartphone unit shipments in millions



Worldwide mobile ad revenue in billions



With open mobile devices now hitting existing and emerging markets, equipment manufacturers, application vendors and service providers are tackling the steak of this sizzle--solving the technical and operational challenges to enable a new world where mobile devices overtake desktops for Internet access.

Access to new technologies including Wi-Fi, femtocell, WiMAX and LTE, combined with the need for legacy infrastructure and existing billing and operational system integration, add to the complexity of widespread deployment and adoption of open mobile platforms. These technical and product lifecycle challenges are faced by semiconductor companies, handset manufactures, independent software vendors and service providers alike. These challenges can be logically grouped into the following:

- Creating a compelling user experience and user interface
- Maturation of complete solutions based on open operating systems like Android and Symbian
- Deployment modeling, network engineering and performing the complex testing;
- Billing, provisioning, operational and business system integration
- Ensuring adequate security for mobile devices and applications;
- Enabling a smooth migration to future wireless technologies like WiMAX and LTE

### Experience Engineering

Today's consumers expect more from their mobile device. One of the first priorities for meeting that expectation is to conceptualize the ideal user experience. A user interface should be compelling, easy to use, and able to be implemented given the technologies that must be managed, such as power consumption, screen resolution, access technology, security and more. This step has long been the responsibility of the device manufacturer and solutions were dictated by the unique characteristics of specific hardware and software. Because of the technical challenges faced in just meeting functional requirements, creating a satisfying user experience has too often been a low priority, resulting in usability compromises. Inconsistency exists across a carrier's product lineup, which can result in lost dollars for the carrier. Industry research shows that 55 percent of potential 3G users abandon value added services (VAS) due to basic usability issues such as difficulty navigating through menus, inability to find downloaded content, or a forgotten password.

New, more flexible mobile platforms such as Android promise to reintroduce creativity and invention into this process. An external community of developers can create, iterate on, and refine modular software components. Designers and engineers can spend more time envisioning new products and services, and less time struggling to make the pieces work together. This will allow carriers and handset



manufacturers to differentiate their products to meet customer demand and get them to market faster. Interfaces and interactions can be harmonized across the product line, not only for core applications, but also for sourced applications as well. And devices become endlessly customizable over the entire lifespan of the product.

### Open OS-based Solutions--Growing Pains

The concept of open OS platforms is compelling, but there are still some well documented hurdles for developers to overcome in order to compete with well established devices, like the iPhone or Blackberry, where virtually all of the hardware and software development are centrally managed.

First, existing smartphone solutions already have significant market penetration, and most have recently delivered enhancements to considerably improve user experience for browsing the Web, playing games and experiencing multimedia applications. Consumers have taken notice. The iPhone revolutionized the user experience, and as a result 25-percent of 3G users switched to AT&T after its launch .

World Wide Smartphone Shipments

Company	Q3 08	Market Share	Q3 07	Market Share	Growth
Nokia	15.5M	42.4%	16M	48.7%	-3.1%
RIM	5.8M	15.9%	3.2M	9.7%	81.7%
Apple	4.7M	12.9%	1.1M	3.4%	327.5%
HTC	1.7M	4.5%	1.3M	4%	25.9%
Sharp	1.2M	3.4%	1.5M	4.7%	-19.3%
Others	7.6M	20.9%	9.6M	29.4%	-20.9%

Source: Gartner\*

Second, application vendors will be forced to analyze the availability of trained resources and choose one particular operating system. Recreating an application experience on multiple operating systems is a daunting task that becomes even more complicated and costly on the backend when supporting it on different code-trains for each OS.

Finally, the open mobile community faces significant challenges from dependencies outside of its control, including the hardware manufacturers, application vendors and service providers. For example, device manufactures for the most part are taking longer than predicted to integrate the new open mobile operating systems, including the interfaces required for application vendors and service providers to customize the solution to their satisfaction.

Moving the entire open mobile ecosystem forward, including broad interoperability assurance with the existing complex ecosystem, is a daunting task.

### Modeling, Interoperability and Performance Testing

Any new device that connects to the mobile network requires extensive preparation on the operator's part to ensure that the device works well on the existing network. Data-intensive applications, such as real-time maps and videos, can significantly impact the performance of the overall network. Hence, [bandwidth](#) utilization, security and application performance all need to be modeled based on real world deployment scenarios, which help operators better plan capacity usage and prepare for network upgrades.

Testing new devices, operating systems and applications in a lab is one thing. Ensuring they work as designed in the highly complex global mobile operating ecosystem is another. Interoperability testing with carrier networks, different wireless network types, and various

provisioning are but a few examples of what must be tested. To ensure satisfied consumers, everything from end-to-end application performance to customer service must be tested.

A range of "Type Approval" services must be completed, including:

- Electromagnetic Compatibility Testing (EMC)
- RF
- UL
- FCC
- Safety
- Network Equipment Building Systems (NEBS)

### **Network Integration and Billing**

Commercial deployment across today's wireless networks requires a significant amount of legacy network integration, including provisioning, operational and billing system integration and testing to ensure smooth execution. There are several documented examples of AT&T and Verizon's activation system breakage when new devices, including the [BlackBerry Storm](#) and iPhone, were released.

Almost all [communications](#) service providers (CSPs)--including traditional telecommunication service providers, MSOs/cable operators, wireless service providers, ISPs and data communication service providers--are candidates for rolling out innovative new mobile services. The network's neurological center, responsible for subscriber activation, quality of service and proper billing, is the carrier's operational and business systems (OSS/BSS). Clearly assurances must be in place to ensure new open mobile devices are integrated into the CSP's operational and billing systems for commercial success.

### **Ensuring Security for Mobile Users**

Historically mobile networks were closed and used primarily for voice communications, resulting in a generally secure infrastructure. The mass-market adoption of smart phones, the use of Wi-Fi access with these devices, and the shift to open mobile platforms present four distinct security challenges that need to be managed.

1. The laptop data problem. With phones now capable of storing so much data, one of the biggest security risks is losing the physical device, allowing hackers and thieves access to the unencrypted data. Mobile phone developers must take the same responsibility as laptop developers to ensure the [encryption](#) and secure transference of data and other precautions.
2. Wi-Fi Access. Just like using a [computer](#) to surf over the Wi-Fi networks, mobile subscribers must take the appropriate steps to ensure sensitive data is protected, typically by using encrypted channels of communications, often known as virtual private network (VPN) connectivity.
3. Hackers and Viruses. Open mobile platform deployments are still in their early days, but as these devices grow in computing power and popularity, just like PCs, they no doubt will be an attractive target for hackers. But traditional [antivirus](#) software will run down the battery power, so experts say mobile security will require new approaches and partnerships between manufacturers, carriers and application developers.<sup>3</sup> As a result, experts expect to see a rise of mobile optimized anti-malware and [firewall](#) solutions designed to offer the same protection including malicious and virus software detection and control.
4. Data Recovery. As cellular devices move closer to becoming our "mobile wallets," a significant amount of valuable business and consumer data will be stored on them.

So a significant emphasis will need to be put on developing [backup](#) and recovery applications and services to protect this data.

#### **4G Evolution**

As open mobile devices are being developed and tested, most ecosystem participants, including hardware manufacturers, application vendors and service providers all are doing so in line with emerging wireless initiatives like WiMAX and Long Term Evolution (LTE). These wireless networking technologies promise much faster speeds and ubiquitous mobile [broadband](#) capable of producing user experiences that can compete with wired PCs. Operators are also looking at increasing their revenues by cannibalizing the wireline service providers and investing in technologies like femtocell that improve in-building wireless coverage. Therefore, from a development standpoint, many involved in the open mobile device [domain](#) are ensuring they have adequately planned for the 4G environment. Consequently, most predict we are heading into over the coming years.

#### **Summary**

Open mobile platforms offer great promise for the future of mobile communications. They are also helping push the mobile communications world towards the simplicity, openness and broadband speeds of traditional IP networks. There are, however, a number of complexities to navigate prior to mass market acceptance. The success and timing of broad deployment will be highly dependent on the pace in which these challenges are resolved and the willingness of the communications community to work together for the change.

Source: Olista, February 2007; American Technology Research, March 2008

<sup>2</sup>Source: Olista, February 2007; American Technology Research, March 2008

<sup>3</sup>Source: Georgia Tech Information Security Center Emerging Cyber Threats Report for 2009, October 2008

#### **About the Author**

*Keith Higgins is Vice President of Marketing for Aricent, Inc., a global innovation, technology and outsourcing company focused exclusively on the communications industry. He is a seasoned executive with over 20 years experience working for some of the world's leading communications companies.*