

# New Types of Devices Pose Disruption for Tech Incumbents

*New device types, as illustrated by Apple's iPhone and iPad, are challenging the PC's leading role in computing and Internet access.*

BY KEITH MALLINSON

**W**e are in the midst of a revolution in ownership and usage for mobile computing and Internet access devices. Whereas laptop and notebook PCs have become the primary personal computing platforms for the affluent in developed nations, smartphones typically complement these by providing benefits such as more pervasive Internet access on the go. In addition, there is an increasing variety of new devices that sit in between these polar extremes in personal computing and communication, including smartbooks, netbooks, eReaders and tablets. Definitions relating to functionality, form factor and how high level the operating system is for each are not always clear or consistent.

The smartphone category will continue to grow enormously, with these devices becoming the primary computing platforms for the majority of people worldwide. Smartphones for less than \$100 will provide computing and Internet access to the global masses in a similar way that mobile phones in general have provided telephony and text messaging to more than 3 billion people.

What is uncertain is exactly which of these other new device types and form factors will succeed, and what the usage and business models will be. Will I travel with three devices, including laptop, some kind of in-be-

tween device and a smartphone or will I leave my laptop at home and rely on cloud services to access personal or corporate data sets and applications that are too large or cannot be secured to run locally on a netbook or smartphone?

Is the fact that the iPad tablet will not fit in a handbag a major limitation to its utility for book reading while eBooks are particularly popular on the smaller iPhone? My sport coat pocket can accommodate a 5.7-inch screen rather nicely. Despite the appeal of a device that size, I'm not sure it could ever replace my phone. Would I be willing to hold such a large device to my head – Gordon Gekko style? Will over-the-top content prevail, or will we be weaned into paying for content as we do with our cable and satellite TV subscriptions?

Market research gives us limited and unreliable guidance on adoption of entirely new and unproven types of device and usage paradigms. We can, however, be pretty sure that some very successful new devices, usage models and probably also business models will emerge in this middle ground.

## TECHNOLOGY MARKETS

Whereas smartphones, emerging smart device types and PCs are ceasing to be in such distinct and separate markets due to convergence in use cases such as watching video or reading books, the markets for the underlying

silicon technologies are also converging. But PC operating systems remain quite distinct from those used in smartphones and most other devices. Virtually all PCs today are based on technologies from the so-called Wintel alliance with Windows OS and Intel microprocessor technology. The exception is Apple with the proprietary Mac OS for its PCs, but even these use Intel processors.

So strong and entrenched are the market positions of Microsoft and Intel in PCs that the firms have been subject to various antitrust authority remedies. For example, Microsoft is now obliged to assist Windows users in selecting from a variety of browsers. Intel was fined \$1.4 billion by the European Commission, and the U.S. Federal Trade Commission is demanding some compulsory licensing and restrictions on bundling, among other measures.

In smartphones and with most of the new device categories I have identified, it is ARM-based microprocessors and a wide variety of operating systems and software platforms including Symbian, iPhone, BlackBerry, Windows Mobile and Android that prevail. Notwithstanding the near monopoly of the ARM architecture, it is implemented under license to numerous semiconductor vendors, including Freescale, Infineon, Marvell, Nvidia, Qualcomm, Samsung, ST Ericsson, Texas Instruments and many others.



Maillison

Wintel will be challenged as the markets for computing and Internet access from PCs to smartphones coalesce. Whereas operating systems are not making the jump across the divide from smartphones to PCs and vice versa, microprocessor architectures are doing so. Microsoft maintains two different operating environments, with the recent introduction of Windows 7 for PCs and with Windows Phone 7 Series due for commercial availability at year end.

Similarly, Apple has Mac OS and iPhone, and Google is promoting Chromium OS and Android. On the other hand, recently announced MeeGo by Intel and Nokia is a software platform that will help Intel's x86 architecture move down from its PC stronghold.

Increasing processing power from ARM-based processors, including dual core and GHz architectures, will provide conventional competitive constraints against Intel's x86 – as opposed to just antitrust remedies – as ARM extends its reach into high-end PC-like functionality. Competition to Windows will be increasingly from the alternative of cloud-based computing via these lighter OSs and thinner client devices. ●

*Keith Mallinson is founder of WiseHarbor, solving commercial problems in wireless and mobile communications, [www.wiseharbor.com](http://www.wiseharbor.com). He can be reached at [kmallinson@wiseharbor.com](mailto:kmallinson@wiseharbor.com).*