Devices, Trends and Predictions
The Future of Mobile Devices in the Enterprise

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Surprising Facts

• This year, more than 50% of network devices will ship without a wired port (Morgan Stanley).

• By 2015, there will be 7.4 billion 802.11n (WiFi) devices (ABIResearch).

• 1.2 billion smartphones will enter the market over the next 5 years, ~40 percent of all handset shipments). (ABIResearch)

• Smart devices are being adopted 10X faster than that of the 80s PC revolution, 2X faster than that of 90s Internet Boom and 3X faster than that of recent social network adoption (Flurry)
This Year Smartphones Eclipsed Feature Phones

**U.S. Smartphone Penetration**

February 2012, Nielsen Mobile Insights

Read as: During February 2012, 50 percent of US mobile subscribers owned a smartphone

Source: Nielsen
Mobile Devices will Dwarf PCs

Source: Business Insider
Enterprise Mobility will look very different in 3 years

- Enterprise tablet adoption will grow by almost 50% per year.
- Mobile app development projects will outnumber native PC projects.
- Vendor markets (hardware, software) will consolidate and evolve.
- Apple’s iOS and Android platforms will mature; Windows 8 on Smartphones/Tablets will expand into the market.
- BYOT (Bring Your Own Technology) gains mass acceptance.
- 4G, Cloud Computing, Wi-Fi and the continuous adoption of HTML5 will make smartphones, tablets even more integrated into the work environment.
- Touch-screen functionality will migrate to desktop and laptop platforms.
- Price points of touch-screen devices will continue to decline.
Post-PC Workers

Globally, one quarter of devices used for work are a smartphone and tablet, not a PC

Global info workers use a combination of multiple work and personal devices for work

Source: Forrester
Mobility Use Spreading Throughout the Organization

Source: Dell
Top 10 Mobile Devices in Enterprise: Q2 2012

Source: Good Technology
Smartphones Continue to Proliferate in Enterprises

• CIOs rating mobility as one of their top four priorities in 2012 [Computerworld]

• BYOT (Bring Your Own Technology), Productivity and Employee Satisfaction major drivers

• In two years’ time, enterprises will be looking at a completely different landscape of mobile devices and applications with respect to their enterprise focus and utility

• Functions like LTE, GPS, Bluetooth, Wi-Fi and NFC will expand corporate usage (video presentations, desktop like functionality, collaboration, etc) as the devices become more powerful
Smartphones remain consumer-first devices

Source: Google
Smartphone Vendor Landscape

Source: IDC

Worldwide Smartphone Vendors Market Share, 2Q 2012

Top Five Smartphone Vendors, Shipments, and Market Share, Q2 2012 (Units in Millions)

<table>
<thead>
<tr>
<th>Vendor</th>
<th>2Q12 Unit Shipments</th>
<th>2Q12 Market Share</th>
<th>2Q11 Unit Shipments</th>
<th>2Q11 Market Share</th>
<th>Year-over-year Change</th>
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<tbody>
<tr>
<td>Samsung</td>
<td>50.2</td>
<td>32.6%</td>
<td>18.4</td>
<td>17.0%</td>
<td>172.8%</td>
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<tr>
<td>Apple</td>
<td>26.0</td>
<td>16.9%</td>
<td>20.4</td>
<td>18.8%</td>
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<tr>
<td>Nokia</td>
<td>10.2</td>
<td>6.6%</td>
<td>16.7</td>
<td>15.4%</td>
<td>-38.9%</td>
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<tr>
<td>HTC</td>
<td>8.8</td>
<td>5.7%</td>
<td>11.6</td>
<td>10.7%</td>
<td>-24.1%</td>
</tr>
<tr>
<td>ZTE</td>
<td>8.0</td>
<td>5.2%</td>
<td>2.0</td>
<td>1.8%</td>
<td>300.0%</td>
</tr>
<tr>
<td>Others</td>
<td>50.7</td>
<td>32.9%</td>
<td>39.2</td>
<td>36.2%</td>
<td>29.3%</td>
</tr>
<tr>
<td>Total</td>
<td>153.9</td>
<td>100.0%</td>
<td>108.3</td>
<td>100.0%</td>
<td>42.1%</td>
</tr>
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</table>

Source: IDC Worldwide Mobile Phone Tracker, July 26, 2012

Note: Vendor shipments are branded shipments and exclude OEM sales for all vendors.
Smartphone Trend Favors iOS and Andriod

Source: ChangeWave Research
The enterprise mobile vendor landscape will evolve rapidly

- Operating systems will continue to remain Microsoft for desktop, but will largely be Apple’s iOS and Android for Mobile
  - Microsoft in catch-up, may remain a niche

- Some Hardware Vendors will disappear: High risk: RIM, Motorola, HTC, Nokia, HP, Dell (PC replacement). Some will niche (eg ruggedized or high security)

- Some newer entrants will emerge as tomorrow’s leaders

- Apps (both 3rd party and internal) continue to expand rapidly
  - Apple's iOS - app breadth advantage, many developers prioritize the iPhone.
  - Android -- more devices, and a more open platform, but high fragmentation
  - Windows Mobile has superior out-of-the-box integration with Microsoft Outlook and Office on the desktop.
Tablets

- Tablets are showing up in warehouses, hospitals, cockpits, and boardrooms. They're making sales calls and on the battlefield.

- Early experiences with tablets show that it still takes creative IT work to make these tools do what companies need them to do.

![Worldwide media tablet shipments split by OS](chart.png)
Microsoft Surface
Penetration still early

What Percentage Of Your Employees Use Tablets For Business?

- None: 13%
- Less than 1% to 10%: 59%
- 11% to 25%: 16%
- 26% to 50%: 5%
- 51% to 75%: 3%
- 76% to 100%: 4%

• lessons companies are learning as they take consumer-oriented iPad and Android tablets and put them to work in ways their makers never planned
  – People Need Content (presentations, demos, applications, etc)
  – They Don’t replace Laptops
    • best for information consumption (consume and monitor information and quickly reply with fairly short emails, eg on the road)
    • Instead of replacing a lot of laptops, look for tablets to replace industry-specific computing devices, like point-of-sale terminals
  – They are replaceable at $200
    • as CIOs embrace this consumer product cycle, they will move away from three- to five-year innovation cycles to one- to two-year cycles
Tablet Policies All over the Map

**Tablets: Where Next?**

Percentage who agree or strongly agree with these statements:

- We’ll provide basic IT support for employees’ personal tablets: 44%
- “Road warrior” employees will prefer a tablet over a laptop: 35%
- We’ll create customer-facing content or apps specifically for tablets: 31%
- A significant number of customer interactions will come via tablets: 26%
- Tablets will be a nonevent for us: 23%
- We’ll provide tablets to at least 10% of employees who would normally have desktops or laptops: 23%
- We have no idea what our tablet policy should be: 20%

Data: *InformationWeek* 2012 Outlook Survey of 605 business tech pros, October 2011
Personal Clouds

• **Increased mobile devices driving uptake of free personal cloud services**
  – Two-thirds of US online adults are using at least one form of a broad range of personal cloud services [Forrester]
  – Fifty-eight percent of personal cloud users with smartphones use personal cloud services daily or hourly
  – With the advent of Dropbox, Google Docs, etc, mobile users are now using more cloud services for their personal use even without realizing it
  – Almost half of personal cloud services are used for blended work and personal purposes.

• **Enterprise Benefits**
  – Cloud applications give mobile devices similar functionality as the personal computer, but add flexibility, scalability and convenience

• **Security Concerns**
  – Some companies still do not want to depend on file sharing and storage methods that utilize public cloud computing
    • They’re setting up their own large-file transfer services using products from Biscom and Accellion, among others, to allow password-protected access to upload or download large amounts of data [InfoWorld].
4G LTE Business Applications

- High quality video calling
- High quality video conferencing
- Give mobile workers the same experience with enterprise applications as they would have in the office
- Faster machine-to-machine connections
- Better productivity through improved multi-tasking on mobile devices
- Delivering real-time video streaming for training, teaching or technical support
- Downloading very large files such as PowerPoint, high-resolution photos, technical drawings, blueprints, diagnostic images, advertising concepts or user manuals
- Working with data-intensive enterprise functions such as CRM systems, HRIS applications, supply chain management and inventory systems
- Working with cloud-based applications more effectively
- Monitoring facilities, mobile assets or security cameras in real-time

Source: Rogers
4G LTE

• LTE (Long Term Evolution), a standard all NA carriers working towards for wireless communication of high-speed data

• Fastest theoretical maximum speeds compared to HSPA+ and WiMax
  – provides downlink peak rates of 300 Mbit/s, uplink peak rates of 75 Mbit/s
  – will enable video applications, —including, but not limited, to video-sharing, surveillance, video conferencing, and streaming in higher definition than existing 3G (including video and TV on demand)
  – would download a high-definition movie with about 15 minutes

• Anticipated to become the first truly global mobile phone standard

• Benefits
  – Expected to be a global standard
  – Speed, lower latency
  – Increased carrier competition
  – Higher bandwidth opens the door for new apps and a richer experience
  – Multi-user support (always on support)
  – Deep security
  – Power consumption (theoretically) improved

• Issues
  – Not ready for prime time
  – Costs could be higher than expected, Performance lower
Challenges for IT

• Forcing a reassessment of the client platform and IT best practices

• BYOD Headaches
  – The need to manage smartphones that are either provided by the employee, or by the company, increases the need for mobile device management (MDM)
  – A CIO: “BYOD is more expensive because you have to do all the same maintenance and management, but you now have to do it virtually; you also need to figure out not only how to secure the data for normal use but also how to erase data when a device is lost or traded in.”

• 63% of surveyed CIOs believe increased productivity and user empowerment through BYOD comes at a significant cost
  – Allowing employees to use their own device is estimated to cost businesses 20% more than providing them with a company-secured contract.
  – Researchers found that it took a median of 2.9 staff members to manage 1,000 smartphone users in 2011 and 3.6 staff members to do the same work in 2012. That number is expected to increase to 4.0 staff members by 2013

Source: Osterman Research, MDS
Irresistible Force

IT expects significant growth in bring-your-own-device (BYOD) next year, whether IT supported or not.†

Expect increase of employees:

- 5% to 10%: 27%
- 10% to 20%: 18%
- More than 20%: 13%
- 58%

- Bringing their own smartphone to work: 58%
- Using their own Apple Mac computer (not iPad) at work: 18%
- Bringing their own computer to work: 15%

Source: Forrester, Feb 2012 Survey
Security Challenges

• **2012 Norton Cybercrime Report**
  
  – 2/3 of adults use a mobile device to access the internet
  – Mobile vulnerabilities doubled in 2011 from 2010
  – 31% of mobile users received a text message from someone they didn’t know requesting they click on an embedded link or dial a #
  – 35% of adults have lost their mobile device or had it stolen
  – 2/3 don’t have a security solution; 44% aren’t aware that security solutions exist
  – 44% access personal emails via free or unsecured WiFi connections, including risky behavior (31% shop online, 63% access social networks, 24% banking)
  – 30% do not think about cybercrime because ‘it won’t happen to them’
  – 46% do not have strong passwords
Updates and Customized Software Reliability Challenges

• Lesser Control
  – tablet operating system updates taught it that using consumer tablets means it won't get the kind of advanced warning about code updates and new features that it's used to getting with enterprise software.
  – In addition to the charging snafu, its Android tablet providers have sent OS updates that broke the custom code that it wrote for those devices

• Backend legacy systems integration

• Cant control features (eg turn off iPad camera or disable iTunes or Apple App Store)
Device Ownership Debate

• Some think the best practice for most companies is to own the device so that they have better access to it
  – "You can download Angry Birds and take photos of your kids and upload them to Facebook, but [the company] reserves the right to treat it like the corporate asset that it is,
  – a company might choose to mitigate a shortcoming of BYOD -- the high cost of individual service plans -- by getting a less expensive group rate for those participating in the COPE program.

• Other organizations believe that as long as they can manage the content on the mobile device, they don't need to own the device
  – But those that need to secure sensitive data on the devices should avoid BYOD policies

• Companies need to plan how they'll use BOYD and implement policies ahead of time, and they need to be flexible enough to change them as the mobile device space changes.

• Legal issues can also surface with BYOD
  – In Europe and Asia, for example, it is illegal to wipe personal devices because of consumer privacy laws.
Mobile Device Management (MDM)

• Organizations will need an arsenal of tools, policies and back-end scripting to monitor, manage and control devices.

• MDM software allows for remote wipe of lost tablets, remote updates, and policy settings based on people's roles.

• MDM can protect applications, patches and security agents that are properly provisioned and can allow data to be automatically backed-up and protected while at rest and in transit.

• It can also allow devices to be triaged, disabled or wiped clean if compromised.

• The vendor landscape is crowded. There is the potential for consolidation over the course of 2012.
MDM Adoption

Source: Enterprise Device Alliance, Oct 2011
Crowded MDM Vendor Landscape

- there are ~ 80 Mobile Device Management solutions available
- Most deployed: BlackBerry Enterprise Server or BES (53%), other vendors (24%), Microsoft System Center Mobile Device Manager in third place (22%).

Figure 1. Magic Quadrant for Mobile Device Management Software

Source: Gartner (April 2011)
In House Mobile Apps: Native vs Web

- **HTML5-based Web app**
  - Addresses cross platform issues (write once, work on any device)
    - Solves device fragmentation, thus easier to support
    - Extension of corporate service-oriented architecture
  - Not enterprise grade
    - Based around sharing photos, sharing documents, sharing video
    - Has legacy issues such as security and unreliability
    - Still highly dependent on web browsers with their issues and vulnerabilities
    - Highly restricted by bandwidth – may impact cloud synchronization (when have a bottleneck, some of the objects are not being synchronised completely)
    - When the application is a transactional application (e.g. purchase orders) that needs to include things like consistency, data integrity, rollbacks, HTML5 is not the right platform to do that today

- **Native Applications**
  - Because of variations in browsers. Native apps are generally snappier
  - There are some things you can't do well with a Web app, like take full advantage of device features like the camera or GPS, or the tablet's graphics capability.
  - More expensive to develop and support
  - May require app store approval (Apple)

- **Virtual desktop (often Citrix Receiver)**
  - Set expectations carefully, the experience can vary greatly (e.g. radiology images not of diagnostic quality)
Development Resources

• **In-House**
  
  – Hiring a fleet of iOS developers
    
    • Not ideal - the combo of mobile development and enterprise IT expertise is so rare
  
  – Java developers
    
    • Can take some, with minimal mobile skills, and molded them into its Android team.
    
    • Most top-notch IT pros like learning the hot skills and see the career opportunity

• **Contractors**
  
  – But be careful - Just because development shops have first-rate design skills doesn't mean they can do the integration or security work businesses need, or understand the scale of enterprise apps.
  
  – It's Wild, Wild West -- Some have more iPad experience, but others know your industry better
Futures

Samsung Galaxy Beam
It’s a sunny day.

Good morning

Wed, May 27

Meeting with Min

PM 12:00

Visit Unicef

PM 01:00

Trend research

Hot keys

E-mobile

Schedule
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