Personal Devices in the Workplace
NC Digital Government Summit
August 31, 2012

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Mobile is Pervasive

Companies large and small are also developing their own mobile apps to target new customers or engage existing ones.

**Businesses Making Sense of Mobile**

**iPhone is being deployed or tested by**

- 80% of Fortune 500 companies

**iPad is being deployed or used at**

- 65% of Fortune 500 companies
Mobile Expense Management

By 2015 there will be almost 15 BILLION network-connected devices according to Cisco Systems. That means more than 2 per every person on the planet.

- 1,000 covered employees x 2,000 connected devices = 24,000 service charges per year
- 5,000 covered employees x 10,000 connected devices = 120,000 service charges per year
- 20,000 covered employees x 40,000 connected devices = 480,000 service charges per year

75% of companies said they were not managing their mobile expenses effectively.

http://www.xigo.com/byod/
SALES OF WEB-ENABLED MOBILE DEVICES HAVE SURPASSED SALES OF WEB-ENABLED LAPTOPS, NOTEBOOKS, AND DESKTOP COMPUTERS.

BY 2016, IT'S PROJECTED THAT CUMULATIVE MOBILE APPS DOWNLOADS WILL REACH 44 BILLION.

DAILY NEWS UPDATE:
MOBILE APPS DOWNLOADS REACH 44 BILLION.

THE WORLDWIDE ONLINE APP MARKET IS EXPECTED TO GROW FROM ABOUT $6.8 BILLION IN 2010 TO $25 BILLION BY 2015.

SOURCES
BUSINESSWEEK, FORRESTER, ABI RESEARCH, READ WRITE WEB, FROST & SULLIVAN, GIGAOM PRO
How we use our smartphones

<table>
<thead>
<tr>
<th>Activity</th>
<th>Average Time Per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet</td>
<td>24mins 49secs</td>
</tr>
<tr>
<td>Social Media</td>
<td>17mins 29secs</td>
</tr>
<tr>
<td>Music</td>
<td>15mins 38secs</td>
</tr>
<tr>
<td>Games</td>
<td>14mins 26secs</td>
</tr>
<tr>
<td>Phone calls</td>
<td>12mins 6secs</td>
</tr>
<tr>
<td>E-mails</td>
<td>11mins 6secs</td>
</tr>
<tr>
<td>Texting</td>
<td>10mins 12secs</td>
</tr>
<tr>
<td>TV/film</td>
<td>9mins 23secs</td>
</tr>
<tr>
<td>Books</td>
<td>9mins 22secs</td>
</tr>
<tr>
<td>Camera</td>
<td>3mins 28secs</td>
</tr>
</tbody>
</table>

Source: O2

http://buzzmachine.com/2012/07/05/its-mobile-phone-so-it/
Huge Tablet Growth Expected

While tablet use is currently low, over half believe that at least 5% will primarily use tablets in the next 12-18 months.

Blue=current, Red=projected over next 18 months

http://gov.aol.com/2012/07/31/tablets-poised-to-gain-broader-use-by-federal-employees/
Worldwide Phenomena

Do you allow employees to bring their own devices to work?

- 40% Yes, we allow at least some access to corporate applications
- 30% No, because we are concerned about security
- 15% Yes, but only for internet access
- 11% No, but we would like to in the future
- 4% No, we have no plans to allow this

Europe, Middle East & Africa
Satisfaction is the Key

Bring Your Own Device (BYOD) is gaining popularity as more and more businesses are allowing their employees to connect their personal devices to their business network.

BYOD PLEASES BUT GETS COMPLICATED FAST WITH THE PLETHORA OF DEVICES AVAILABLE

50% of I.T. Managers believe BYOD increases productivity
66% of employees want to use any device
61% of companies that allow BYOD have higher employee satisfaction

40% of college students would accept a lower paying job to use a device of their choice
45% of employees

Aberdeen found that the cost to a company from a carrier such as: Sprint, verizon, at&t is on average

$80 PER USER PER MONTH

COMPANY OWNED DEVICE

$70 PER USER PER MONTH

BYOD

75% OF COMPANIES ALLOW BYOD

50% ALLOW ANY DEVICE
25% SPECIFY DEVICES
25% DON'T ALLOW BYOD

http://www.xigo.com/byod/
BYOD Pros and Cons

Pros:
- Students and employees can use familiar devices to complete their tasks.
- BYOD saves companies and schools money by allowing people to use devices they already have.
- Students and employees will likely remember to bring devices if they enjoy using them.
- Students stay engaged and take control of their own learning.
- Employees can cut back on the amount of devices they carry.
- The technology students and employees own tends to be more cutting edge.

Cons:
- Students may forget to bring devices or their chargers.
- Students and employees may not be able to afford these devices.
- Student may be easily distracted while working on their own devices.
- Applications and tools may not be universal across all platforms.
- Getting everyone’s devices to work together can be difficult.
- Better security and management result in IT costs increasing.

http://www.onlinecolleges.net/2012/08/06-going-byod/
Top Barriers to BYOD

**BYOD - BRING YOUR OWN DEVICE**

- 66% of employees want IT to let them use any device they choose
- 45% of IT workers aren't prepared to support a borderless mobile workforce

61% of companies that let employees use personal mobile devices have higher employee satisfaction.

**TOP 3 BARRIERS TO BYOD**

- SECURITY 57%
- BUDGET 34%
- STAFF EXPERTISE 17%
What are the main challenges you face with respect to BYOD?

- Securely connecting employee devices (2%)
- Avoiding the use of more IT resources (9%)
- Building enough wireless coverage and capacity (14%)
- Ensuring mobile device security (16%)
- Establishing a corporate policy on acceptable use (18%)
- Enforcing access rights based on user, device and application (20%)
- Evaluating the business benefit, relative to risk (11%)
- Other (10%)

Europe, Middle East & Africa
2012 Horizon Report – Technologies to Watch

• Within next 12 months:
  – Mobile Apps
  – Tablet Computing

• Within 2~3 years:
  – Game based learning
  – Learning analytics

• Within 4~5 years:
  – Gesture based computing
  – The Internet of Things

Historical View: Enterprise Client Evolution

Yesterday
- Unmanaged
  - Fixed Client
- Security Challenges
- Unmanaged
- Inefficient operations
- Client-server

Today
- Device Managed
  - Fixed & Mobile Client
  - Focus on TCO efficiency
  - “One size fits all”
  - Monolithic image locked to device
  - Mainstream mobility
  - Internet Computing

Evolving
- Centrally Managed Virtual Client
  - CHV (DVC) & SHV (VDI)
  - Drive to centralized administration
  - Virtual workspaces
  - 1:many user/device
  - Compute, collaborate & communicate
  - Wireless broadband

Emerging
- Cloud Managed Client-aware
  - Cloud Computing
  - On demand computing
  - Elastic, ubiquitous
  - Virtual computing
  - Device independent mobility (device aware)
  - N-screens
  - 3D Internet

Device Centric

User Centric

IT@Intel

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BYOD

Brandyn Federlick
LaserFiche
Personal IT Devices on a University Campus

Marc Hoit, PhD
Vice Chancellor for IT
NC State University
NC State is a Small City

- 34,000 Student, 8,000 Faculty & Staff
  - 11 Colleges – each with departments
  - 57 centers & institutes
- $1.2 B annual expenditure budget
- Business focus: Education (training) & Research
  - Research: $361M annual expenditures
- 2,120 acres in size
  - 348 Buildings > 1000 sq ft
  - 14.2 million gross square feet
  - 1.2 million rentable square feet on Centennial Campus
  - 18.7 miles of paved roads
  - 72 residence halls housing 8,454
Smartphones are Everywhere

A majority of students and adults own the devices necessary for BYOD.

Of adults (18+) surveyed in 2011, percentage ownership of different BYOD devices are:

- Smartphones: 85%
- Laptop Computers: 52%
- Desktop Computers: 59%
- Tablet / eReader: 19% (from 2012)
- iPod / MP3: 47%

Costs BYOD Users Pay Out of Pocket:

- Device and service plan costs, minus eligible expenses: 20%
- Device and service plan costs, minus stipend amount: 25%
- Percent of BYOD employees who pay: 50%
- Device costs only, company pays for all service plan costs: 5%
Growth in acceptance of BYOD

A 2011 Study Revealed:

80% of companies supporting BYOD have more than 2,000 employees.

50% of companies with BYOD models require employees to cover all costs, and they’re happy to.

45% of BYOD companies give their employees a stipend to help subsidize the cost of their device or service plan.

Of companies that responded:

- 72.2% currently support BYOD
- 14.8% considering, but no specific timeframe
- 3.9% plan to support BYOD in next 12 months
- 9.3% not planning to support BYOD

http://www.onlinecolleges.net/2012/08/06-going-byod/
Mobile Growing in Higher Ed

“Universities should consider treating mobile practices similar to the Internet in terms of importance, resources, and development.”

Many expect mobile computing to become an integral part of higher education...

Expectations of heavy to very heavy demand for mobile IT in four areas:
- Research: 9%
- Administration: 10%
- Instruction: 20%
- General communications: 35%

90% of respondents expect spending on mobile-enablement to rise over the next three years.

92% of institutions are providing some level of support—at no charge—to users of mobile devices.*

*Source: EDUCAUSE Core Data Service, educause.edu/coredata

http://www.educause.edu/library/resources/mobile-it-higher-education-2011-report
Many are Watch and Wait

...but many colleges and universities are watching and waiting.

“Making mobile apps a priority in terms of cost and time is not core, in my opinion. We just have to wait for the market or institutional collaboration to mature.”

38% say they mobile-enabled
35% report
19% say they have

ZERO ZERO ZERO services in past 12 months
ZERO ZERO ZERO spending on mobile
ZERO ZERO ZERO FTEs working on mobile

http://www.educause.edu/library/resources/mobile-it-higher-education-2011-report
For those that are working on mobile initiatives, students are the focus.

"[The killer mobile app would be] any that helps students with learning and support services."

### Priority and level of enablement for student/public services

- **IT services and support**: 21% Some/most enabled, 32% High/Highest priority
- **Library catalog and other library services**: 31% Some/most enabled, 32% High/Highest priority
- **Administrative services for student information**: 22% Some/most enabled, 50% High/Highest priority
- **Learning/course management services**: 38% Some/most enabled, 55% High/Highest priority
- **Student recruitment and admissions**: 23% Some/most enabled, 57% High/Highest priority
- **Primary web presence**: 40% Some/most enabled, 64% High/Highest priority

### A lot, almost all, or all of mobile demand being met for three constituencies

- **Students**: 22%
- **Faculty**: 10%
- **Staff**: 8%

### Institutions that agree they are prepared to meet expected mobile demands for the 2011–2012 academic year in these areas:

- **Research**: 41%
- **Administration**: 46%
- **Instruction**: 51%
- **General communications**: 58%

*Among only institutions reporting a research-focused mission*
University Mobile Collaboration

• Collaboration between central and distributed IT groups
• Manage Apple and Android developer licenses
• Apple Applications
  – WolfWalk - A photographic guide to the history of NC State University.
  – WolfMatch - A free Match 3 game from NC State Distance Education
  – MySchedule – Mobile access to students class schedule and mapping
  – MicroExplorer 3D – Mobile microscope training tool
  – Mobile Video Framework – Mobile training video tool – How to videos
• http://m.ncsu.edu mobile website (Android & iOS)
Social Media - http://twitter.ncsu.edu

- Aggregates all of NC States (nearly 200) twitter accounts into a single feed.

- Collaboration:
  - Outreach Technology provides back-end integration with Twitter
  - University Communications provided user interface and design

- Outreach:
  - Source: https://github.com/jfaustin/Tweet-gater

- Training: Effective use Twitter to communicate
Instructional Technology is Rapidly Changing

• Technology causes disruptive change
  – Skype and the telecommunications industry;
    Professors are “Skyping” their students
  – Twitter - professors tweeting changes to
    assignments and reminders.
    • Flip side, students are twittering in class if they are bored!
  – The Plant Pathology vLab
    http://courses.ncsu.edu/ww201/common/game/index.html. (It'll take a while to load so be patient)
  – MOOC – Massive Open Online Courses (200,000 students, get “certificate”)
• We must allow and support people to explore new innovations
vLab to Diagnose Plant Disease

Welcome to the Lab!

Technician,

Welcome to the Plant Pathology lab, where you will conduct tests on a tomato plant. We have charged you with the task of identifying the pathogen responsible for the disease of this specimen.

You will be guided through a series of processes that will lead to your eventual hypothesis, observation, testing, and diagnosis of the plant specimen. After completion, your work will be sent to your e-mail.

Various tools will aid you in your use of the lab, take a moment to familiarize yourself with them during your introduction. If you have further questions, the question button in the lower left of the game screen will provide valuable information when clicked.

Dr. Shew
Instructional Technology Sampler

• Enterprise: Learning Management Systems
  – Moodle, Blackboard, Sakai, OpenClass
  90% of two and four year colleges are using an LMS (Bates & Sangra, 2011)

• Content Capture

Vs

• Emerging
  – Sharepoint (as LMS), Google Sites, Tumblr, Scoop.It, Google+, Facebook, CISCO WebEx

OpenClass – Pearson Publishing Free LMS built on Google
Around COE Mobile for Students

• Computer Science department using Android devices for JAVA programming courses

• Campus wide Mobile Task Force
  – Set up new mobile security guidelines

• My Schedule application developed to deliver a student’s course schedule tied with map data
  – Ties into Engineering maps data to locate course’s building
  – Find people included also using maps
  – Provides instructor information and location from directory services
It’s here...how to embrace and support it.

2. WHAT’S THE RIGHT POLICY?

GOOD
ESTABLISH A CLEAR POLICY limiting the number of devices.

- Device Policies
- Establish a clear policy limiting the number of devices.
- Average number of connected devices per worker is expected to reach 3.3 by 2014

BAD
BUT DON’T OVERDO IT!

- Leave enough of a selection that employees still feel like they have a choice.

UGLY

- Don’t announce a BYOD program without any policies set in place! That’s a recipe for disaster.

A growing area for NC State…

- Students and employees expect to access campus services from personally owned devices.
- Google Apps for Education is our messaging platform (faculty, staff & students)
- More use of cloud technology (e.g., Google Drive, DropBox, etc.)
- More sensitive data and legislation
- More diversity of devices and software
- Setting service expectations is crucial
  - 24 hour support
How to access services, not how to use the device.

4. WHAT’S THE IMPACT ON I.T.?

GOOD
Minimize IT involvement with BYOD users: deploy a centralized mobile device management solution for IT admins to manage the WHOLE DEVICE FLEET.

BAD
DON’T ABANDON
BYOD users: they carry most responsibility for device and software maintenance, but should still have IT available.

UGLY
DON’T OVERWHELM YOUR I.T.
Create set hours when IT will be available for one-on-one problems or build a robust internal site with resources that employees can turn to when they need assistance.

84% of businesses both ALLOW & SUPPORT employee-owned devices.
Who is responsible?

University responsibility

• Establish device standards (browsers, mobile platform/OS, etc.) and communicate to clients.
• Provide configuration information for key University-provided services (email, calendar, etc.)
• Support connections to key services

Client responsibility

• Ensure that device is functional—can it connect to services off-campus?
• What data is on the device and is it secure?
• Report loss/theft of the device quickly.
3. WHAT'S THE EMPLOYEE'S ROLE?

GOOD

ENGAGE & EDUCATE
employees with device workshops.

BAD

PROVIDE DEVICE GUIDELINES
highlighting strengths and weaknesses, but let employees make the final decision.

UGLY

Don't ban devices FOR NO REASON
Evaluate and move quickly to bring new technology into the fold.

6.8 MILLION:
Number of Android and iOS devices activated last Christmas Day
Key Business Decisions…

• Can employees use personally-owned devices for their work?
• If so, what are your requirements of them?
  – Security standards
  – Data retention requirements
  – Data compliance requirements
Stipend for personal mobiles

- Support employee personal preferences
- Potentially reduced cost for organization
- Apply policy to personal device usage
- Avoid multiple mobile devices
- Avoid personal use of state owned devices
- Inventory and some control
Protect the data, allow access

5. HOW DO WE TACKLE SECURITY?

GOOD
PROTECT YOUR NETWORK
Keep BYOD and corporate-owned on separate Wi-Fi networks.
VPN, mobile device management and network-access control are must-haves for any BYOD enterprise.

43% of companies have rolled out a BYOD security strategy

BAD
AVOID
launching a BYOD initiative before doing a thorough audit of your network.

UGLY
KEEP YOUR NETWORK SECURE,
BUT DON'T BAN THINGS LIKE
REMOTE ACCESS

70% of Cisco employees work at least 20% of the workweek at home

Current Security Summary

• Focus on central site protection
  – Focus on keeping intruders and malware out

• Focus on user education

• Multiple solutions

• Moving towards more automation

• Setting regulations for encryption
Moving forward...

- Personal devices are here to stay.
- New services should be designed with personal devices in mind.
- In the workplace, don’t confuse workplace behavior with technology.
It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change.

~ Charles Darwin ~