Mobile Devices
General Overview

Prepared for
IT Partners

By Andrew Yu (Mobile Devices Platform Coordinator)
12/04/2006
Agenda

Disclaimer: Only Palm OS is supported by IS&T today

- Mobile Device Platforms
- History
- Devices
- Carrier Support
- Comparisons
- Using Mobile Devices at MIT
- Q&A

December 5, 2006
Mobile Device Platforms

- 4 Major Platforms: Palm OS, Windows Mobile, BlackBerry, & Symbian
- 2006 U.S. Market evenly split between Palm OS, Windows Mobile and BlackBerry. 2007 U.S. Market will likely see further growth of Windows Mobile and BlackBerry
- Carriers providing sales, marketing, support
- Trend: Phone Centric, Persistent Storage (Flash), “Office Mobile”, Push-Email, Mobile Web, High Speed Data, Multimedia, etc.
## Current Devices – Palm OS
(November 2006)

<table>
<thead>
<tr>
<th></th>
<th>Verizon Wireless</th>
<th>Sprint</th>
<th>T-Mobile</th>
<th>Cingular</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treo 700p</td>
<td>Treo 700p</td>
<td>NONE</td>
<td>T-Mobile</td>
<td>Treo 650</td>
<td>T</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Z22</td>
</tr>
</tbody>
</table>

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## Current Devices – Windows Mobile
(November 2006)

<table>
<thead>
<tr>
<th>Windows Mobile</th>
<th>Verizon Wireless</th>
<th>Sprint/Nextel</th>
<th>T-Mobile</th>
<th>Cingular</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smartphone</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorola Q</td>
<td></td>
<td>i920/i930</td>
<td>SDA</td>
<td>2125</td>
<td>3125</td>
</tr>
<tr>
<td>Pocket PC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treo 700W</td>
<td></td>
<td>PPC 6700</td>
<td>Treo 700WX</td>
<td>iPaq</td>
<td></td>
</tr>
<tr>
<td>Samsung</td>
<td></td>
<td>Samsung</td>
<td></td>
<td>Blackjack</td>
<td></td>
</tr>
<tr>
<td>VZW XV 6700</td>
<td></td>
<td></td>
<td></td>
<td>Treo 750</td>
<td>8525</td>
</tr>
<tr>
<td>i920/i930</td>
<td></td>
<td></td>
<td></td>
<td>2125</td>
<td>3125</td>
</tr>
<tr>
<td>SDA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dash</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3125</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8525</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Current Devices – BlackBerry
*(November 2006)*

<table>
<thead>
<tr>
<th>Verizon Wireless</th>
<th>Sprint</th>
<th>T-Mobile</th>
<th>Cingular</th>
</tr>
</thead>
<tbody>
<tr>
<td>7250</td>
<td>8703e</td>
<td>7290</td>
<td>7290</td>
</tr>
<tr>
<td>7130e</td>
<td>7130e</td>
<td>7100i</td>
<td>7130c</td>
</tr>
<tr>
<td>8703e</td>
<td>7520</td>
<td>7105t</td>
<td>Pearl</td>
</tr>
<tr>
<td>7290</td>
<td></td>
<td>Pearl</td>
<td></td>
</tr>
<tr>
<td>7130e</td>
<td></td>
<td>8700g</td>
<td>8700c</td>
</tr>
</tbody>
</table>

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## Mobile Platform Comparisons

<table>
<thead>
<tr>
<th>MIT Environment</th>
<th>Palm OS</th>
<th>Windows Mobile</th>
<th>BlackBerry (BIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Email</td>
<td>PIM Synchronization (wireless)</td>
<td>PIM Synchronization (Cable)</td>
</tr>
<tr>
<td>Email</td>
<td>Good</td>
<td>Useable</td>
<td>Good</td>
</tr>
<tr>
<td>PIM Synchronization (wireless)</td>
<td>Useable</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Calendar</td>
<td>Useable</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Contacts</td>
<td>Good</td>
<td>Useable</td>
<td>Useable</td>
</tr>
<tr>
<td>Tasks</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>PIM Synchronization (Cable)</td>
<td>Useable</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Web Browsing</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Device Price</td>
<td>$200 - $400 (avg: $285)</td>
<td>$140 - $410 (avg: $273)</td>
<td>$100 - $260 (avg: $166)</td>
</tr>
<tr>
<td>Carrier Support/Device Choices</td>
<td>4</td>
<td>12</td>
<td>7</td>
</tr>
<tr>
<td>Document Viewing</td>
<td>Better</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Document Editing</td>
<td>Better</td>
<td>Good</td>
<td>n/a</td>
</tr>
<tr>
<td>Certificates (Secured Sites)</td>
<td>n/a</td>
<td>Better</td>
<td>Better</td>
</tr>
<tr>
<td>Wi-Fi Enabled Devices</td>
<td>1</td>
<td>15+</td>
<td>2</td>
</tr>
<tr>
<td>Additional Monthly Fee for Dial-up Networking/Tether</td>
<td>$15 - $30</td>
<td>$15 - $30</td>
<td>$15 - $30</td>
</tr>
</tbody>
</table>
## Carrier Support

<table>
<thead>
<tr>
<th>Carrier</th>
<th>Palm OS</th>
<th>Windows Mobile</th>
<th>BlackBerry</th>
<th>Symbian</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verizon Wireless</strong>&lt;br&gt;(CDMA/EVDO)</td>
<td>Palm Treo 650 ($120)&lt;br&gt;Palm Treo 700p ($270)</td>
<td>Motorola Q ($100)&lt;br&gt;Samsung 1730 ($140)&lt;br&gt;Samsung i830 ($240)&lt;br&gt;Palm Treo 700w ($270)&lt;br&gt;VZW XV6700 ($270)</td>
<td>7250 ($30)&lt;br&gt;7130e ($50)&lt;br&gt;8703e ($120)</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Sprint/Nextel</strong>&lt;br&gt;(CDMA/EVDO)</td>
<td>Palm Treo 650 ($259)&lt;br&gt;Palm Treo 700p ($350)</td>
<td>Sprint PPC-6601 ($259)&lt;br&gt;Nextel i930 ($259)&lt;br&gt;Sprint PPC-6700 ($289)</td>
<td>7250 ($150)&lt;br&gt;7520 ($150)&lt;br&gt;7130e ($200)&lt;br&gt;8703e ($250)</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Cingular</strong>&lt;br&gt;(GSM/EDGE/ HSDPA)</td>
<td>Palm Treo 680 ($200)&lt;br&gt;Palm Treo 650 ($250)</td>
<td>Cingular 2125 ($100)&lt;br&gt;Cingular 3125 ($150)&lt;br&gt;Samsung BlackJack ($200)&lt;br&gt;Cingular 8125 ($250)</td>
<td>7290 ($100)&lt;br&gt;7130c ($200)&lt;br&gt;8700c ($250)</td>
<td>Nokia E62 ($100)</td>
</tr>
<tr>
<td><strong>T-Mobile</strong>&lt;br&gt;(GSM/EDGE/ HSDPA*)&lt;br&gt;*US HSDPA Expected in 2007</td>
<td>n/a</td>
<td>T-Mobile SDA ($150)</td>
<td>7105t (FREE)&lt;br&gt;7100t ($70)&lt;br&gt;7290 ($100)&lt;br&gt;Pearl ($200)&lt;br&gt;8700g ($300)</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>PDA’s</strong>&lt;br&gt;(wi-fi)</td>
<td>Palm T</td>
<td>X ($300)&lt;br&gt; W</td>
<td>HP iPAQ hx4700 W&lt;br&gt;HP iPAQ rx1955 W&lt;br&gt;Dell Axim X51v W&lt;br&gt;Pharos Traveler GPS W&lt;br&gt;Symbol MC70 W, MC9000&lt;br&gt;Dolphin 7900 W, 9500 W, 9550 W</td>
<td></td>
</tr>
</tbody>
</table>

Note: Prices for smartphone devices reflect MIT discount and additional discount where applicable with 2-year contract. Prices are rounded up. Prices as of 11/2006. W denotes built-in wi-fi. Prices for Windows Mobile PDA’s vary greatly, but they generally start at $200.
## Carrier Comparisons

<table>
<thead>
<tr>
<th></th>
<th>Verizon Wireless</th>
<th>Sprint/Nextel</th>
<th>T-Mobile</th>
<th>Cingular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Plan Monthly Cost</td>
<td>$25 – $45 (10 MB- unlimited)</td>
<td>$11.25 (unlimited)</td>
<td>$30 (unlimited)</td>
<td>$5 – $40 (10 MB- unlimited)</td>
</tr>
<tr>
<td>Data Plan Monthly Cost</td>
<td>$25 – $45 (10 MB- unlimited)</td>
<td>$30 – $38 (5MB- unlimited)</td>
<td>$20 – $30 (unlimited)</td>
<td>$35 (unlimited)</td>
</tr>
<tr>
<td>Dial-up Networking/Tether</td>
<td>+$15</td>
<td>+$30</td>
<td>n/a</td>
<td>$75 (BlackBerry)</td>
</tr>
<tr>
<td>Monthly Cost</td>
<td>EVDO</td>
<td>EVDO</td>
<td>EDGE</td>
<td>EDGE/HSDPA</td>
</tr>
<tr>
<td>High Speed Data Type</td>
<td>EVDO</td>
<td>EVDO</td>
<td>EDGE</td>
<td>EDGE/HSDPA</td>
</tr>
<tr>
<td>Data Speed</td>
<td>Better (400 – 600 kbps)</td>
<td>Better (400 – 600 kbps)</td>
<td>Usable (~100 kbps)</td>
<td>Better (~600 kbps)</td>
</tr>
<tr>
<td>Wi-Fi Availability</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>International Roaming</td>
<td>Usable</td>
<td>Usable</td>
<td>Better</td>
<td>Better</td>
</tr>
<tr>
<td>MIT Status/Discount</td>
<td>Preferred 15% Corp./Per.</td>
<td>Preferred 22%/15% Corp./Per.</td>
<td>8% Corp./Per.</td>
<td>15%/10% Corp./Per.</td>
</tr>
</tbody>
</table>

MIT’s preferred vendors for corporately liable phones are Sprint/Nextel and Verizon Wireless. If neither of these vendor’s products or services meets the customer’s needs, we’ve established some reduced pricing with other vendors.

December 5, 2006
Using Mobile Devices @ MIT

- Email
- Calendar & Contacts
- PIM (Calendar/Contacts/Tasks Synchronization)
- Password Protection
- Certificates: MIT CA & Personal Certificates
- Accessing Secured Web Sites
- Document (View/Edit): Office Mobile & PDF
- Mobile Web Examples
Windows Mobile Email: Outlook Mobile

Pros:
- Native support for IMAP including “synchronization” of folders
- Attachment support
- Scheduled “pull”
- Multi-threading

Cons:
- Attachment/Long Message Retrieving cumbersome
- UI can be improved
- Searching is difficult
Palm OS Email: VersaMail

Pros:
- Native support for IMAP
- Attachment support easy to use
- Scheduled “pull”
- Usable Search via Find application

Cons:
- No native support for IMAP folders
- No Multi-threading
BlackBerry Email: BIS

Pros:
- Scheduled “push”
- Native support for IMAP
- Attachment support easy to use
- Fast Search options
- Extensive Shortcut Keys
- “Multi-threading”

Cons:
- No native support for IMAP folders
- One-way IMAP Sync
- New Message Idiosyncrasy
BlackBerry Email: BIS Message Flow

Message flow: Send a message using polling

1. The subscriber's email account receives a new email message from the Internet.
2. The BlackBerry® Internet Service checks the email account for new email messages every 15 minutes.
3. When the BlackBerry Internet Service finds a new email message, it downloads the email message.
4. The BlackBerry Internet Service sends the message to the subscriber's BlackBerry device over the wireless network.

The approximate delivery time is 15 minutes.
Calendar

Windows Mobile Pocket PC

Palm OS

BlackBerry

December 5, 2006
Desktop Sync vs Wireless Sync

Desktop Sync:
- **Pros:**
  - More accurate data field mapping
  - Ability to transfer larger data to device at faster speeds
  - *Necessary to install applications, certificates, etc.*
- **Cons:**
  - Cannot sync away from computer
  - Too many points of potential failure

Wireless Sync:
- **Pros:**
  - PIM Sync from anywhere
  - Direct to Oracle Calendar
- **Cons:**
  - Requires Wireless Data Connection
  - Inaccurate data field mapping for some platforms
Password Protection

Enter password to access this device:

****

OK  Make Emergency Call
Certificates

Windows Mobile:
• Installing Personal Certificates requires 3rd Party Software

BlackBerry:
• Built-in Personal & Root Certificate Installer via Desktop Sync
• Usage requires entering password each time

Palm OS:
• No facilities to import personal certificates
• Root certificates cannot be installed by users easily
Accessing Secured MIT Web Sites

The following application is requesting access to the private Andrew J Yu's Office Depot account. Please enter store password.

Order MIT Best Value Items, MIT Specific, and Recycled Products via "My Shopping Lists"

Welcome Andrew J Yu. Please enter the following information to specify the name and address of the person to whom this order will be delivered.
Word & Excel

Mobile Platform Support Recommendations for MIT

Prepared by Andrew Yu
(Mobile Devices Platform Coordinator)
Date: October 27, 2006
Mobile Web Sites (External)


- **Finance:** E*TRADE, Ameritrade, Fidelity, Schwab, Scottrade, TD Waterhouse, Bigcharts, Bloomberg, CBS Marketwatch, Financial Times, Stockcharts.com, Yahoo Finance, Motley Fool, …

- **Weather:** Weather Channel, Yahoo Weather, IWIN NOAA, Weather Underground, AccuWeather…

- **Travel:** Google Local, Mapquest Maps & Directions, Rovenet, American Airlines, British Airways, Cathay Pacific, Continental Airlines, Delta Airlines, Northwest Airlines, Qantas, United Airlines, UK Rail, Dollar car rental, …

- **Portals/Search Engine:** Google, Yahoo, MSN, AOL, Lycos, InfoSpace, MobilePlay, …

- **Other Categories:** Sports, Pictures, Audio, Video, Movies, Blogs, Shopping, …
Mobile Web Example (Yahoo)

Palm OS
Windows Mobile
Pocket PC

Blazer
http://wap.oa.yahoo.com/?fre=Go

Yahoo!

Yahoo! recommends upgrading to the NEW, safer Internet Explorer 7

Blacksberry
Mobile Web Example (Answers.com)
Mobile Web Example (MIT) [Before]
Mobile Web Example (MIT) [After]

There were 123 matches to your request.

- Severson-Smith, Adele M. Medical Department
- Smith, Amanda C. G
- Smith, Adam M. G
- Smith, Adam D. MIT Affiliate
- Smith, Annette MIT Affiliate
- Smith, Adam R. Year 1

There was 1 match to your request.

name: Severson-Smith, Adele M
email: severson-smith@mit.edu
phone: 617-253-4567
address: W32-023
department: Medical Department
title: Trainer/Physical Therapist
Mobile Web Example (IS&T) [Before]
IS&T Mobile Device Support

- **To Be Determined**
- **Questions to IT Partners**
  - What type of support for mobile devices would benefit your users and the MIT community?
  - What type of issues related to mobile devices would be better supported locally and we can refer your users to you?
  - Given limited resources, some support for mobile devices might have to be fee based. What levels of support do you feel your users would see as premium and thus justify fees being charged?
Useful External Sites

- Palm OS:  
  - www.palm.com
- Windows Mobile:  
  - www.microsoft.com/windowsmobile
- BlackBerry:  
  - www.rim.net
- Third-Party Software:  
  - www.handango.com
- Mobile Web Sites:  
  - wurfl.sourceforge.net
  - mobile.palmone.com/us/
Q&A

- Questions?
- Join Mobile Partners User Group
  - Web: http://mit.edu/mobilepartners/
- Please send feedback and additional questions to:
  - Andrew Yu (andrewyu@mit.edu)
Fun Facts (1 Year Comparison)
Fun Facts (5 Year Comparison)
Mobile Web Example (Google)
Email: Outlook Mobile (Setup)
Palm OS Email: SnapperMail
Email Setup (BIS) via Carrier Web Site
Windows Mobile: Citrix
Windows Mobile Memory Management

NOTE: The following items will be added to the slide
Multi-threading requires manual user management of memory on Windows Mobile