

University of Victoria

Issues with the Use of the BlackBerry PDA at UVic

And a Proposal to Evaluate Alternatives

White Paper

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Introduction

A number of members of the University have expressed interest in mobile devices such as the BlackBerry. This paper looks at the functionality and support of the Blackberry from an UVic perspective and proposes a wider study that includes such alternative devices such as the Treo 650.

The appeal of these devices, sometimes called "smart phones," is that they combine the functions of a mobile telephone and a personal digital assistant (PDA). They can be used both to make phone calls and maintain personal calendars, contact lists, and task lists; these latter functions are typically tightly integrated with University-level services such as Microsoft Outlook or the Oracle Calendar. They can also be used to send and receive electronic mail, and to view Web pages and access electronic documents.

There is a concern, however, that the electronic mail and calendaring functions of some smart phones such as the BlackBerry are not compatible with the electronic mail and calendaring services currently provided by the University. A working group has therefore been formed to assemble technical information on the BlackBerry and comparable devices, and to identify the technical issues surrounding their support by the University.

This report summarizes the findings of the working group, and identifies some of the costs associated with the BlackBerry smart phone. The report also offers a recommendation for a course of action to identify a minimum set of requirements (both client and technical) for a smart phone that will meet the needs of members of the University and which the University can support.

Summary Review of the BlackBerry

Review of the technical specifications available for the BlackBerry confirmed that its electronic mail and personal calendaring functions are not readily compatible with the services currently operated by the University and cannot be supported by the University. To integrate the BlackBerry functions with University electronic mail and calendaring services requires that three significant server applications be installed. This requirement carries substantial cost implications in terms of licence fees, the time of systems administration personnel, and potentially additional server hardware.

The technical review also revealed that the BlackBerry is based on a closed, proprietary design. This design imposes significant limitations on its flexibility. A further consequence is that the BlackBerry likely will not meet the needs of all members of the University who require a smart phone device.

Preliminary examination of the specifications of alternatives to the BlackBerry suggests that devices might be available that would meet the requirements of the majority of University members. These devices likely also could be supported by the University with minimal changes to existing systems and services.

Technical Review

The BlackBerry Smart Phone

The BlackBerry is a smart phone device developed by Research in Motion (RIM) that provides wireless e-mail and Web access via the Wireless Access Protocol (WAP) browser over CDMA 1xRTT and GPRS/GSM networks. Two flavours of the BlackBerry smart phone are available, the Personal Communication Services (PCS) type phone, a two-way digital network with integrated voice, data and messaging capabilities or the IDEN (Integrated Digital Enhanced Network) MiKE, “walkie talkie” type phone that permits phone calls and two-way radio, paging and data transmissions on one device. The BlackBerry supports *always on*, push technology, in which incoming e-mail is automatically delivered to the hand held device without manual intervention

The BlackBerry Enterprise Server

The BlackBerry Enterprise Server (BES) centralizes the administration, synchronisation and control of BlackBerry wireless e-mail and PIM data stored on IBM Lotus Domino, Microsoft Exchange, and soon to be supported, Novell GroupWise, enterprise servers. RIM recommends BES deployment in the corporate environment to improve data security by supporting: the Triple Data Encryption Standard (DES) security standard; Secure HyperText Transport Protocol (HTTPS) Web page connections; and wirelessly activated security policies such as handheld passwords and remotely sent wireless commands that lock or erase handheld data from lost or stolen devices. The BES is also required to extend functionality such as enabling the BlackBerry Browser, which enables HTTP connectivity and supports Java applications rather than restricting website access by using the limited, Wireless Access Protocol (WAP) browser that renders WAP-formatted Web pages designed for mobile phones, and enables synchronisation of the BlackBerry smart phone to more than one computer.

Integration Issues

The BlackBerry Enterprise Server will *not* integrate directly with the University’s UNIX e-mail server that uses the SMTP-based *Sendmail* message transfer agent, or with the Oracle Calendar server. University e-mail can be redirected to the BlackBerry device, but e-mail sent or deleted from the

BlackBerry will not be synchronised to the UVic e-mail server, and e-mail sent or deleted from the workstation desktop will not be synchronised to the BlackBerry.

Wireless synchronisation of the calendar, task lists and contact lists is not supported, requiring wired synchronisation to the workstation desktop. Synchronisation to the Macintosh desktop is not currently supported.

Consilient2 Server

Purchasing another server middleware application, Consilient2 from a third-party vendor, Consilient, will provide wireless integration with the Oracle Calendar server, but the Consilient2 server also requires installation of the BlackBerry Enterprise Server, which is only available on platforms not currently supported by the University, Lotus Domino or Microsoft Exchange. The Consilient2 server component uses the Microsoft Exchange server as the gateway to translate e-mail sent via Sendmail to Exchange e-mail, and the BlackBerry Enterprise Server redirects the mail to the BlackBerry device. User-defined IMAP folders are not accessible from the BlackBerry device. With the Consilient2 server, e-mail sent or deleted from the BlackBerry or from the workstation desktop is synchronised. The status of read and unread e-mail messages is also maintained.

Consilient2 supports BlackBerry devices enabled for CDMA 1xRTT and GSM/GPRS networks, concurrently. Consilient will provide a free, 30-day trial of their software.

Other Issues

Reliance on these additional servers (BES, Exchange and Consilient2) potentially increases the risk of downtime, compromised data integrity and security, and adds to the resources required to maintain wireless services.

In addition to the integration problems, there are a number of other factors that detract from recommending the BlackBerry smart phone:

- The data transmission speed is slow, comparable to dial-up speeds varying from as low as 40 Kbps to as high as 60-80 Kbps.
- The BlackBerry does not contain built-in expansion card slots to accept Compact Flash (CF), Secure Digital (SD) or Secure Digital Input/Output (SDIO) cards that expand the functionality and capability of the device such as adding additional memory, which limits the number of built-in and third-party applications that can be downloaded to the device.
- Fewer third-party applications are available for the BlackBerry than are available for the Palm and Pocket PC smart phone devices and for those applications that are available, they must be purchased from a BlackBerry “partner”, unlike the myriad of free downloadable third-party applications that are available for the Palm and Pocket PC.
- Without the BES server, the BlackBerry is limited to viewing Microsoft Word, Excel and PowerPoint, and Adobe Acrobat PDF files.
- The maximum e-mail file attachment size is 32KB, read in 2 KB segments resulting in a slow and tedious process to read through an entire file attachment.

Telecommunications Carrier Issues

Other issues that must be addressed include the extremely limited international coverage of the CDMA 1xRTT network by the University telecommunications carrier, Telus Mobility. Senior executive staff travel frequently to international destinations not covered by the Telus wireless network. One option is

to rent an internationally enabled BlackBerry device from Roadpost, a company that will provision the rental device with existing personal e-mail, contacts and tasks data contained on the Telus BlackBerry device. Executive staff and faculty who frequently travel, will find this solution cumbersome. The selection of smart phones activated by Telus is limited, and none of the devices support synchronising to the Macintosh desktop.

Conclusion

The BlackBerry product is a closed, proprietary solution that requires the installation of three additional middleware server applications in order to meet the basic requirements and needs of the University – using a single handheld mobile device to make telephone calls; access personal information such as e-mail, calendar, contact lists and task lists; and integrate that information wirelessly with University servers.

One device will *not* meet the needs of all University members. The BlackBerry will provide the necessary functionality required for anyone requiring basic e-mail and calendaring synchronisation providing the BlackBerry Enterprise Server and all required components are purchased and installed. The BlackBerry will not meet the needs of *power users* who require specialised, memory intensive, third-party applications.

Alternative mobile devices should be evaluated including Palm based smart phone devices such as the Treo 600/650, Windows Mobile based devices such as the Pocket PC Samsung SCH-i600 Smart Phone (primarily a cell phone with built-in PDA functionality added) or the Pocket PC Samsung SPH-i700 Phone Edition (primarily a PDA with built-in cell phone functionality added), or Symbian based devices such as Nokia, Motorola, Sony Ericsson and Sendo. Smart phone devices such as the Nokia 9500 Communicator, supports integrated Voice Over Internet Protocol (VoIP) technology and Wi-Fi, wireless local area network (WLAN) access using the IEEE 802.11b network standard, which significantly increases data exchange transmission speed and permits you to make or receive phone calls as long as you are in the coverage of a wireless Access Point.

The Oracle Sync component of Oracle Calendar server supports the SyncML protocol to provide remote synchronisation of calendar data with SyncML enabled devices. Oracle Sync Server offers direct two-way synchronisation with Oracle Calendar server over a standard Hypertext Transfer Protocol (HTTP) connection. This means that you have access to the calendar from SyncML compliant devices with Internet access.

Recommendation

Recent inquiries received about support for the BlackBerry does not indicate that it is the appropriate choice of smart phone to deploy at the University. It is the recommendation of the working group that the next step is to proceed as expeditiously as possible with identifying a suitable SyncML compliant device to evaluate and test with the Oracle Sync Server. This option will eliminate the requirement of purchasing and installing the BES, Exchange and Consilient2 middleware server applications.

Appendices

Appendix A – BlackBerry Requirements, Pros and Cons

Requirements	Pros	Cons
Integrated cellular phone and PDA functionality	One device initiate phone calls, manage e-mail, maintain calendar, contact lists and task lists, view Web pages and access electronic documents	<p>BlackBerry is based on a closed, proprietary design.</p> <p>Slow, 40 Kbps data transmission speed.</p> <p>Compatibility with e-mail and calendaring services requires three additional servers: BlackBerry Enterprise Server (BES), Microsoft Exchange server and Consilient2 server.</p> <p>Cost of the BlackBerry device combined with the additional cost of the BES, Exchange and Consilient2 server account licensing fees, vendor annual maintenance and support fees, server hardware, and the personnel required to maintain the three servers is prohibitive.</p> <p>Reliance on three servers increases risk of downtime, compromised data integrity and compromised data security.</p>
Extensible device which will support the needs of power users who require specialised, memory intensive, third-party applications.		<p>Limited third-party software applications available.</p> <p>Third-party applications available must be purchased from RIM partners, unlike the myriad of free software available for the Pocket PC and Palm.</p> <p>The lack of expansion card slots that accept CF, SD or SDIO cards used to expand the functionality and capability of the device severely limits the number of built-in and third-party applications that can be installed on the BlackBerry.</p>
Wireless e-mail access over CDMA 1xRTT and GPRS/GSM networks	Supports Push “always on” technology	<p>E-mail sent or deleted from the BlackBerry will not be synchronised with UVic e-mail unless the Consilient2 server is purchased and installed.</p> <p>E-mail sent or deleted from the workstation UVic desktop e-mail client (Outlook or Eudora) will not be synchronised with the BlackBerry unless the Consilient2 server is purchased and installed.</p> <p>Consilient2 server requires an additional server (Microsoft Exchange) to redirect e-mail to the BES server.</p> <p>The status of read and unread e-mail messages will not be synchronised with UVic e-mail unless the Consilient2</p>

		server is purchased and installed.
Wireless calendar, contact and task lists access over CDMA 1xRTT and GPRS/GSM networks		<p>Calendar, contact and task lists created on the BlackBerry will not integrate with the University Oracle Calendar server unless the Consilient2 server is purchased and installed.</p> <p>Cannot wirelessly synchronise the calendar, contact or task lists created on the BlackBerry requiring wired (cradle) synchronisation to the (Windows) workstation desktop unless the Consilient2 server is purchased and installed.</p> <p>Cannot synchronise the calendar, task or contact lists to the Macintosh workstation desktop (wired or wirelessly).</p>
Access Electronic Documents		<p>Maximum e-mail file attachment is 32 KB.</p> <p>Slow, tedious process to read file attachments in 2 KB segments.</p> <p>Does not render tables in a readable format.</p>
Wireless Web access to view Web pages over CDMA 1xRTT and GPRS/GSM networks		Requires BES server to support DES security standard, enable HTTP and HTTPS secure Web page connections, Java applications, wirelessly activate security policies and enable synchronisation of BlackBerry to more than one computer.

Appendix B – BlackBerry 7750 Specifications and Features Matrix

Specifications	
Modes	CDMA2000 1X CDMA 800/1900 MHz (GSM/GPRS network in 850/1800/1900 MHz available on other models)
Weight	142g (5.01 oz)
Dimensions	121mm x 77mm x 18mm (4.76" x 3.03" x 0.71")
Included Software	Address Book, Memo Pad, Calculator, Calendar, Tasks, WAP Browser, Web Viewer Messages, Alarm, Phone, BrickBreaker, Compose
Form Factor	Candy-bar, Internal Antenna
Batter Life	Talk: 3.30 hours Standby: Up to 192 hours (8 days)
Battery Type	Removable/Rechargeable Lithium
Display	Type: LCD Colour Size: 240 x 240 pixels 16-bit (64K colors)
Platform/OS	N/A
Memory	14 MB (built-in flash memory) plus 2 MB SRAM
Features	

2 nd Display	No
Alarm	Yes
Bluetooth	No
BREW	No
Calculator	Yes
Calendar	Yes
Call Screening	No
Camera	No
Changeable Faceplates	No
Custom Graphics	No
Custom Ringtones	Downloadable / MIDI format
Data-Capable	No
Digital TTY/TDD	Yes
E-mail client	Push e-mail with attachment viewer
ECML / Digital Wallet	No
EMS / Picture Messaging	No
Expansion Card	No
Flashlight	No
FM Radio	No
GAIT	No
Games	BrickBreaker
GPS / Location	No
Headset Jack (2.5 mm)	Yes
High-Speed Data	1xRTT (GPRS available on other models)
Infrared (IR)	No
Java (J2ME)	Yes
MMS	No
MP3 Player	No
Multiple Languages	Yes
Multiple Numbers per Name	Yes
PC/Mac Desktop Synchronisation	Yes/No
Picture ID	No
Polyphonic Ringtones	No
Predictive Text Entry	No
Push-to-Talk	Available on other models
Ringer ID	No
Ringer Profiles	Yes
Side Keys	Thumb wheel on right side
Speaker Phone	Available on other models
Streaming Media	No
SyncML	No
Text Keyboard	QWERTY

Text Messaging	2-Way: Yes
Text Messaging Templates	No
To-Do List	Yes
Touch Screen	No
USB	Yes
Vibrate	Yes
Video Calling	No
Video Capture	No
Voice Dialing	No
Voice Memo	No
Wi-Fi	No
Wireless Internet	Browser Software: BlackBerry Browser supports Internet (WML and HTML and BlackBerry Mobile Service

Table 1: RIM BlackBerry 7750 Specifications and Features

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Appendix C – Associated Costs

BlackBerry Voice and Data Costs Based on a Two Year Contract	
BlackBerry 7750 Colour Smart Phone (1 year warranty)	\$499.00
Optional Additional 2-year Warranty	119.00
Annual Access Fee (Voice) 17.00 * 12 Corporate \$20/200 with 200 Peak Minutes	204.00
Annual Plan Rate (Data) 34.00 * 12 BlackBerry Unlimited \$40.00 (without WAP)	408.00
Annual Network Support Charge-Waived 1 st year	60.00
Annual System Licensing Fee 6.95 * 12	83.40
Additional Incidental Charges	
Incremental Peak Minute Rate	.20
Text Messaging per message	.10
Caller ID/month	4.25
Canada – Canada LD/min	.10
Canada – US LD per min	.35
US-US or US-CAN LD/min	.50
Call Forwarding, Call Waiting, Conference Calling, Voice Mail (10 messages)	Included
Consilient2 Server Software and Client Access Licensing	
100 Licences	9,200.00

Annual Maintenance/Support Fees	1,840.00
BlackBerry Enterprise Server Software	
120 Licences (first 20 free)	7,999.99
T1 Support per server/year	2,250.00
OR T2 Support per server/year	5,400.00
T3-T5 Support (highest level support also available)	
Exchange Server 2000/2003 Software	
100 Licences	undetermined
Annual Maintenance/Support Fees	undetermined
Server Hardware to Host BES, Exchange and Consilient2 Software	
Pentium 4, 1.5 GHz, 1GB hard drive	undetermined

Appendix D – References

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