Windows Mobile-Based Smartphones: Improving Business Productivity

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Introduction

A Microsoft® Windows Mobile™-based Smartphone looks like a normal mobile phone. However, looks do not tell the whole story. The software inside extends the capabilities of the Smartphone beyond those of a typical wireless phone today, turning it into a business productivity tool.

The Smartphone keeps an up to date copy of your most valuable information stored on your PC. That includes your appointments, contacts, tasks, and e-mail. The Smartphone offers the latest options for staying in touch and can be quickly extended with new applications tuned for the way you and your business work.

Additionally, the Smartphone puts personalized business information literally at your fingertips. For example, an executive can use a Smartphone to quickly view key business metrics and be automatically notified when critical events occur. Similarly, a Smartphone application for sales representatives can automatically pop up background information about customers when they call—so the sales rep can see key customer information even before answering the phone.

This paper examines how a Windows Mobile-based Smartphone can provide you with a better mobile phone experience while also enabling you to receive information wherever and whenever you need it.

How Can This Be Better Than My Current Phone?

Most mobile phone users have found it difficult to make the contacts on their PC readily available on their phone. The amount of information associated with their contacts on a PC typically didn't fit into the limited storage space of a mobile phone. And even if they could get hundreds—or thousands—of contacts onto their phone, accessing all those contacts isn't simple.

The Smartphone changes all that. With the Smartphone, you can:

- **Replicate Microsoft Office Outlook® data easily.** Microsoft ActiveSync® software keeps your PC's Outlook data in sync with the Smartphone, so that information such as contacts, calendar appointments, e-mail, and tasks stays current on both your mobile phone and your PC. No longer do you have to manually enter contacts into a new phone. You can also use ActiveSync to copy key files to your Smartphone. If you use contact management software other than Outlook, third-party products are available to synchronize that information with your Smartphone.

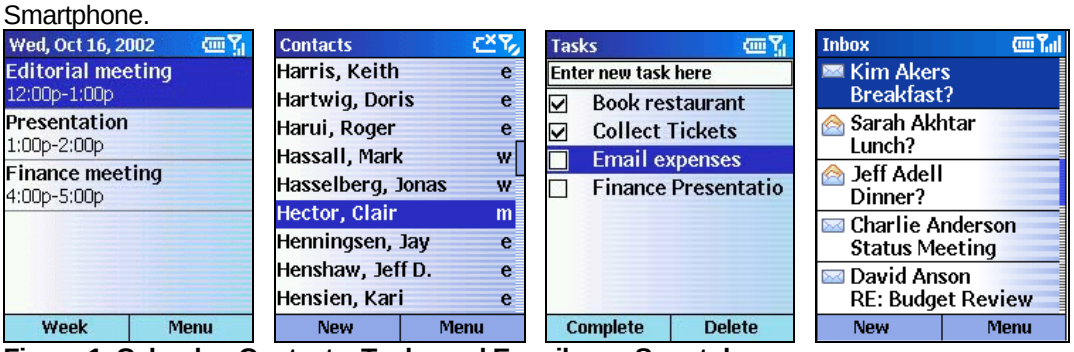

Figure 1. Calendar, Contacts, Tasks and E-mail on a Smartphone.

- **Access contacts quickly with Smartdial.** Smartdial simplifies the process of accessing contact information on your Smartphone. Just start pressing keys associated with the letters in someone's first or last name (e.g. 566 for Jon), and the Smartphone will display the subset of your contacts that matches those letters (see Figure 2). Using the left and right navigation keys on the Smartphone keypad, you can cycle through the different connectivity options for each person—work, home, and mobile phone numbers; up to three e-mail addresses; an MSN instant messenger address; and a Short Message Service (SMS) text-message address. Once you've selected the connectivity option you want, just press the "Action" button on the keypad to contact that person (See Figure 3). The navigation buttons form a ring around the Action button and they tilt up, down, left, and right to move around on the Smartphone screen.

Figure 2. Smartdial displays a short list of contacts based on the letters you press.

Figure 3. Navigation and Action buttons make it easy to move around the screen and make selections.

- **Send and receive messages in a variety of ways.** With all the different phone numbers and addresses stored in one's Contacts, there are a number of ways you can stay connected with colleagues, friends, and family. E-mail from both one's personal and business accounts can be accessed from a Smartphone. Working with e-mail on a small phone is a little different from the PC experience. The Smartphone e-mail Inbox is most often used to scan the messages so that important e-mail can be quickly addressed and unneeded e-mail can be deleted. This approach makes good use of downtime, such as when waiting in lines or at the airport, while reducing the time needed to handle e-mail when one returns to their PC. Using a mobile phone number, Smartphones can send SMS text-messages or Multimedia Message Service (MMS) messages to can combine text with attached files or pictures. E-mail can be kept in sync on the Smartphone either over a wireless connection directly to an e-mail server (like a personal Internet Service Provider or via the Server ActiveSync function built into Microsoft Exchange Server used by many businesses) or when connected to a PC. Businesses that use Lotus Notes, GroupWise, or Act! for their e-mail will find a number of server synchronization solutions such as Intellisync Corporation's Handheld Edition or JP Mobile's SureWave software. And Research In Motion (RIM) has announced plans to enable BlackBerry connectivity support on Windows Mobile-based Smartphones.

What Else Is Available on the Smartphone?

In addition to the phone, contacts, calendar, e-mail, and text-messaging functionality in the Smartphone, the built-in software includes a number of useful applications for mobile professionals. These include:

- **Microsoft Internet Explorer Web browser.** You can use your Smartphone to access Web pages both on the Internet and on your organization's intranet. This browser can automatically take Web pages designed for large PC screens and automatically reformat the content so that it fits within the borders of the Smartphone screen. This means there is no left-right scrolling required, just up and down. Supported Web data formats include Hypertext Markup Language (HTML), Wireless Markup Language (WML, also known as Wireless Application Protocol, or WAP); and Extensible Markup Language (XML) which means you can access most any page from your Smartphone that you can view with your PC.
- **Common Windows application platform.** The .NET Compact Framework has now been included in the Windows Mobile 2003 software which enables the same application software to be run on PCs, laptops, Tablet PCs, Pocket PCs, and Smartphones. Applications written using the .NET Compact Framework reside on the Smartphone so that business functions can be performed locally even if there is no wireless connectivity. This can be useful when traveling on planes or working at facilities where wireless connections are not allowed or available.
- **Microsoft Windows Media® player.** You can play video and audio files using the built-in Windows Media player. Although the media player is often thought of as entertainment software, it has a business purpose, too. Sales representatives, for example, may use a video to promote a new product they are selling--or a company may use pre-recorded briefings to keep field-service personnel up to date on the latest information about the company's products.
- **Voice recorder.** Many people are put off by the thought of responding to e-mail on a small Smartphone. Entering paragraphs of text using any of the keypad options is not very compelling. However, the built in voice recorder completely changes this process and makes it simple to respond to e-mail. There is a menu option to "Insert Recording" when replying to e-mail. You just press the Record button to start and stop the recording. The recorded message is a .WAV file attachment that can be played on any PC with speakers. You can also use the voice recorder to capture business dictation or quick notes when writing them down on a piece of paper isn't feasible. New Smartphones are integrating keyboards which make text entry easier.

Figure 4. Either the built-in keyboard in Sierra Wireless' Voq Smartphone or the built-in voice recorder offers quick options for responding to e-mail.

- **MSN Messenger.** Sending instant messages to business colleagues using a PC has become very popular. Now these quick messages can be sent and received from your phone.

Figure 5. Send and receive instant messages on your Smartphone.

- **Modem link.** The Modem Link, "Accessories" utility, enables the Smartphone to be used as a wireless modem for a laptop. The Smartphone can be connected to the PC via a USB cable or, in some cases, with a Bluetooth cable-free connection. Articles on the Web, such as this one by PPCW.net or this one by msmobiles.com, show how to easily set up this modem connection.
- **Calculator.** You can add, subtract, multiply, and divide numbers while you're on the go.

For more information on Smartphone applications, see

www.microsoft.com/windowsmobile/smartphone/default.mspx .

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For information about the security and systems management aspects of Windows Mobile-based Smartphones, view the white papers on these subjects on the Microsoft Web site.

How Can Smartphone Capabilities Be Extended?

Smartphones can be customized to do many different tasks. Employing the same tools and programming languages that are used to create PC applications, such as Visual Studio.NET, developers can quickly write new Smartphone applications.

Smartphone use can be extended by technologies such as Bluetooth wireless connectivity (within a 30-foot range) and Secure Digital Input-Output (SDIO) expansion slots. Bluetooth provides a cable-free wireless connection to PCs for ActiveSync and for hands-free phone headsets. SDIO enables you to use other hardware devices in conjunction with your Smartphone. For example, you could connect:

- A Global Positioning System (GPS) with a SD adapter or with integrated Bluetooth wireless connectivity, which could enable the Smartphone to read out step-by-step driving directions to reach your destination.
- A wireless local area networking card, which you can use in airports, hotels, corporate facilities, and even coffee shops to access business services through the Internet. Virtual Private Networking (VPN) software is built-in to provide an encrypted wireless connection.
- A peripheral that is both a credit-card magstripe reader and a printer, which you can use with a point of sale application on your Smartphone to take orders and print out receipts anywhere you need to conduct business.
- A bar-code reader can be used with a Smartphone to track inventory, enter data into fields, identify your location (as in the case of a security guard), or obtain product and pricing information. For example, a restaurant owner might create an application that uses product bar codes to reorder supplies that are running low. After the user scans the product's bar code and enters the quantity, the Smartphone can send the order to the supplier. Figure 6 shows an example of such an application. Another emerging tool for inventory management is Radio Frequency Identification (RFID). RFID readers are being developed that are expected to plug into or be built into Smartphones similar to the peripherals available for Pocket PCs today.

Figure 6. This restaurant application uses a bar-code scanner to send orders to suppliers.

Figure 7 shows examples of a bar-code reader and wireless LAN card that you can plug into Smartphones that support SDIO peripherals.

Figure 7. Socket offers a bar code reader and wireless LAN card with an SDIO adapter.

For a list of peripherals that work with Windows Mobile-based devices, go to http://www.microsoft.com/windowsmobile/business/solutions/default.mspx .

What Else Are People Doing with Smartphones?

Different industries are finding the new information capabilities of the Smartphone useful for a number of tasks.

Sales representatives, for instance, are using the Smartphone to track their customers, sales activities, follow-up actions, and appointments. Mobile sales applications also give sales representatives quick access to contact information, including driving directions and meeting agendas. Figure 8 shows screenshots from a Smartphone-based mobile insurance application that Mobitor created for its sales representatives.

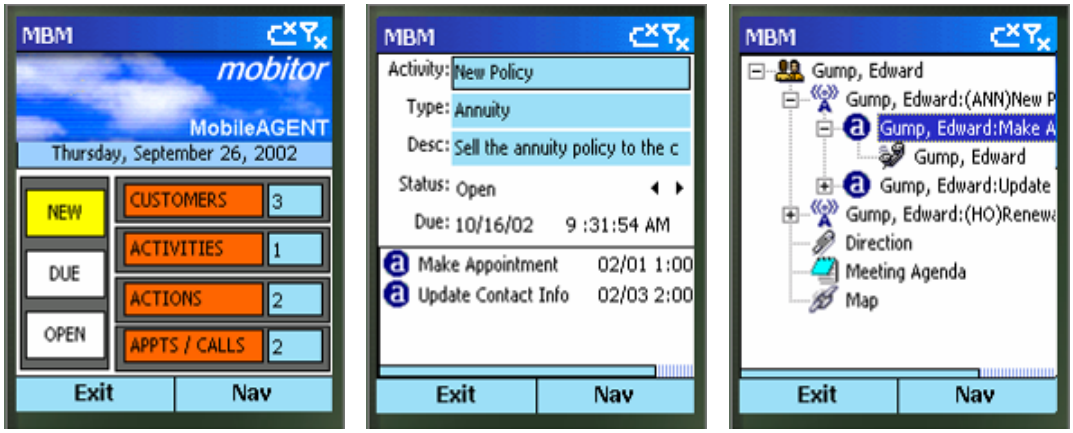

Figure 8. Mobitor has created a mobile application for insurance sales representatives.

Similarly BizzDev, a solution provider based in Belgium, has developed an application for sales representatives selling medical supplies to hospitals. A database on the Smartphone maintains information about the sales representative's last interaction with his customers. When a call comes in, the application displays the contact's name, number, and a summary of the last contact while the Smartphone rings. Figure 9 shows a few screenshots from this *Caller ID CRM* application.

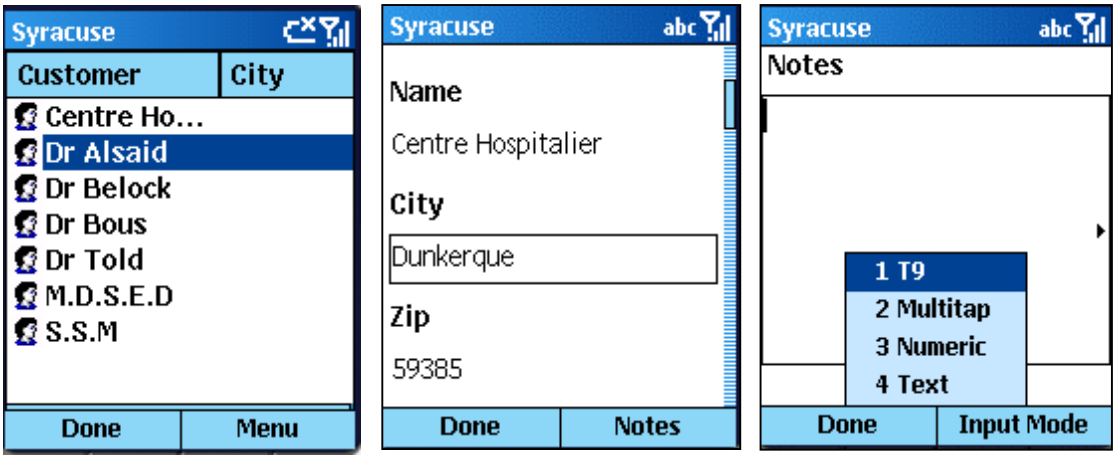

Figure 9. BizzDev has created a mobile application for healthcare instrument sales representatives.

Figure 10 shows a screenshot from MarketWave, a mobile application developed by weComm Ltd. to provide over-the-air financial market data and news feeds.

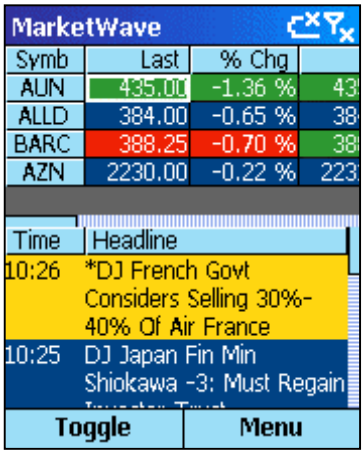

Figure 10. MarketWave, developed by weComm, provides over-the-air financial market data and news feeds.

An application created by Visual IT gives Smartphone users easy access to maps of city transportation systems for London, Paris, and other major cities. Figure 11 shows a sample screenshot from this application. Real time applications are also being developed that give a snapshot of current traffic flows based on road sensors.

Figure 11. This screenshot from a Visual IT application shows a map of London's Tube system.

Pocket Streets for Smartphone offers map guide functionality on your Smartphone. Locate addresses, intersections and points of interest or customize locations by inserting your own pushpins. Download maps of cities in the US, Canada and Western Europe from the Pocket Streets web site, or create your own maps using Microsoft desktop applications MapPoint, Streets & Trips or AutoRoute. Figure 12 shows a push pin, menu options, and a sample of the Points of Interest that are included.

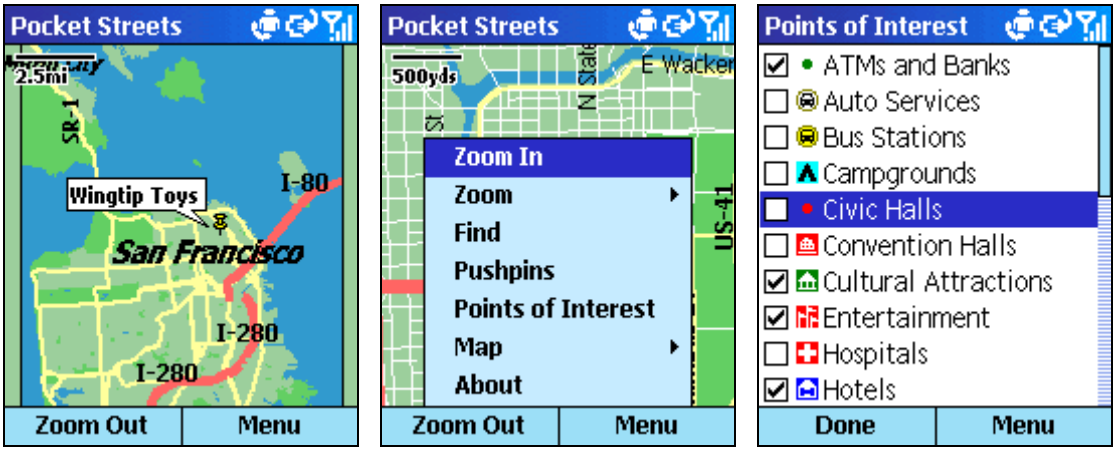

Figure 12. Pocket Streets provides map guide functionality for Smartphones.

People who deliver presentations as part of their work find Smartphone applications like Pocket SlideShow handy. Created by CNetX, this application enables users to show slides in one-on-one settings (see Figure 13).

Figure 13. CNetX has created a Pocket SlideShow application for Smartphone.

Travelers can find dictionaries that run on the Smartphone to do quick word look-ups. Dictionaries are available for a number of languages, including Dutch, English, French, German, Italian, Portuguese, Spanish, and Swedish. Figure 14 shows a Spanish-English dictionary that runs on the Smartphone.

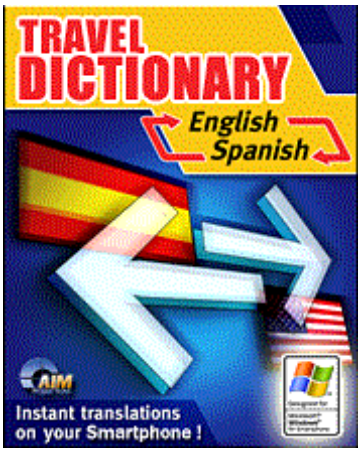

Figure 14. Pocket Travel Dictionary from Smartphone.net.

WESTTEK has created ClearVue, an application that enables different types of files to be viewed on the Smartphone. File types supported by ClearVue include PDFs, Microsoft Office Word files, Microsoft Office Excel spreadsheets, Microsoft Office PowerPoint® slides, and faxes. Figure 15 shows the ClearVue PDF viewer. Cerience Corporation also has a viewer for different document formats. Their product, RepliGo, uses a print driver on the PC to convert anything that can be printed into a document which can be easily read on a Smartphone. This includes automatically formatting all the text in a document to fit within the screen width so that all you need to do is scroll up and down.

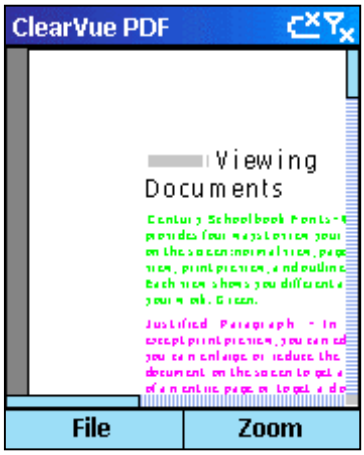

Figure 15. WESTTEK has created ClearVue, enabling users to view a variety of file types on their Smartphone.

Smartphones that have integrated cameras or camera attachments can be used in a number of business scenarios. For example:

- Claims adjustors can capture pictures of insured property that has been damaged to speed the handling of customer claims.

- Government, safety service, and utility employees can capture visual images of damaged property and infrastructure.
- Inspectors who go on location to capture information needed to process financial loans, track goods crossing borders, verify compliance with standards, or perform maintenance on equipment (for example, airline manufacturing, elevator service, and HVAC maintenance inspectors) can use the integrated camera in their Smartphone to capture visual images of the site or equipment being inspected.
- Healthcare professionals can capture a visual record of a patient's condition for research purposes. They can also capture images to send to medical colleagues for a second opinion.
- Public safety officials can capture crime scene and accident photos, uploading them with annotated notes and witness statements.
- Real estate agents can photograph new properties for sale and use their Smartphone to submit the photos to a Multiple Listing Service while the agent is still on the property. Agents can also capture pictures of specific features of interest to their clients and send them immediately as attachments to e-mail or MMS messages.
- Sales representatives can take pictures of how retailers are complying with display guidelines as well as capturing a visual record of competitor's promotions.
- Quality control specialists can take pictures of manufacturing flaws and quickly send them, along with a problem description, to engineers who can design and implement fixes.

Figure 16 shows three examples of Smartphone cameras: a plug-in for the Orange APV, a built-in camera for the iMate, and the ViewTake camera that plugs into the SD slot on the Motorola MPX 200.

Figure 16. A small camera plug-in is available for the Orange SPV (top left); the i-Mate features a built-in camera (top right); and the ViewTake camera plugs into the Motorola MPX200 Smartphone SD slot (bottom).

Conclusion

Windows Mobile-based Smartphones make it easy to access all your contact information from your PC to make calls, send MMS or SMS text messages, and read and respond to e-mail. Smartphones also include a number of built-in applications that simplify keeping track of your appointments, enable you to record notes to yourself, and give you the ability to browse the Internet. The extensibility of Smartphones makes it easy to further expand their functionality by creating new applications which may take advantage of a variety of specialized hardware peripherals.

With all these capabilities, Smartphones have become much more than communication devices. They are also information tools—much like laptops and PDAs—that enable you to access business data and business processes wherever your job may take you.

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