A Manager's Guide to Selecting a Mobile Device Operating System

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Contents

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Introduction

Portable Data Terminals traditionally used by corporations have converged with consumer Personal Data Assistants to form a new breed of mobile computers. These two tools have evolved into mobile computing devices with an array of features and options to enable commerce. A key question facing Information Technology departments is the selection of a mobile computing operating system that minimizes total cost of ownership.

Microsoft provides the two market leading platforms. VDC data indicates that Windows CE 5.0 and Windows Mobile 5.0 will be shipped on over 90% of portable data terminals (PDT) by 2009. Individually, these platforms enable a range of functionalities; discerning the best platform match for specific needs will lead to a successful adoption and implementation.

VDC Market Share Estimate of PDT Operating Systems for 2009

Mobile Offering Analysis: Mobile Devices, VDC, August 2005

Enterprise Mobility Solutions, Mobile Devices, Mobile Software, and Professional Services, Second Edition

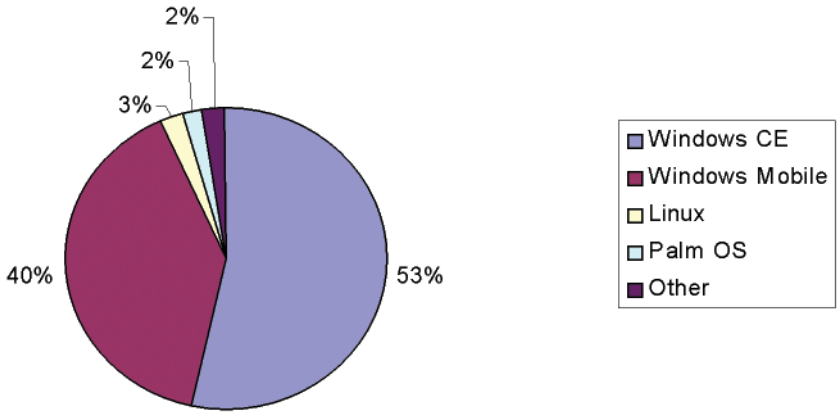

Figure 1: VDC Market Share Estimate

Windows CE is a hard real-time platform that provides a consistent and integrated tool set. Windows CE delivers a broad array of configuration and application options across a wide variety of devices, enabling broader choice for service and solution support. Windows Mobile is a targeted set of APIs and User Intefaces built on top of Windows CE to provide a platform optimized for personal mobile devices. Windows Mobile includes Microsoft's .NET Compact Framework and SQL Server as well as a number of other common APIs that enable third party mobile messaging or line of business applications.

Platform choice empowers the information technology buyer to choose the software technologies, hardware technologies (form factor, display size, input technology, scanner and radio technology), and feature-sets that best meet the individual requirements of the enterprise and environment. This white paper provides the reader with information on current operating system trends and the Datalogic perspective of that evolution, enabling the buyer to make the best choice for the enterprise.

Problem

As more vendors offer Windows CE and Windows Mobile powered computing devices, understanding the differences between the platforms and the solutions they enable is key in the mobile computing environment. Much of the differentiation comes down to determining the primary overarching need for either standardization or customization. Recent research indicates a split between the two options based on an organization's IT needs. How does an Information Technology buyer decide between the two major options? The following questions may help steer the manager toward one or the other OS.

Is the application primarily for employees using both a traditional office set-up and a mobile office, like store managers or store associates?

Windows Mobile may be more productive for an employee who divides computing time between a Windows Desktop and a Windows Mobile device, especially for those who need full time access to tools like Outlook, Word, Excel, PowerPoint, and Internet Explorer. Windows CE is more likely to be the choice for an associate who only needs certain applications tailored to the business process, in other words, line of business applications.

What is the current IT infrastructure?

Legacy installations of either platform will make simpler transitions to newer Windows CE or Windows Mobile versions respectively. However, consideration of the longer-term information technology strategy should be taken into account.

Is terminal emulation a requirement?

Windows CE is the logical choice for terminal emulation environments where the extra bells and whistles of Windows Mobile are unneeded.

Do you have or plan to use or create custom applications, applications designed by your VAR or systems integrator, or will you use standard off-the-shelf applications?

Work associated with application creation is similar for both operating systems. However, the use of off the shelf applications would make Windows Mobile a logical choice. This is a key intent of the Windows Mobile OS and Microsoft provides a list of Gold Mobile partners whose applications serve this purpose.

What are your RAM and/or Flash memory requirements?

Windows CE devices provide more memory for applications and data storage. Windows Mobile is tailored to different kinds of needs and tends to have less memory, though storage expansion slots are available on most devices.

Is interface continuity across your enterprise a requirement?

Windows Mobile provides a consistent computing experience for users from desktop PC to mobile device. This reduces the cost of training and increases efficiency through familiarity with device attributes.

Implications and Risks

It is critical to understand the nature and relationship between Windows CE and Windows Mobile. Both products come from the same set of building blocks. The major difference is one of standardization. Cross compatibility has increased between the different embedded Windows operating systems, largely fueling rapid acceptance. Vertically oriented devices may include, but certainly are not limited to, point-of-sale systems, automotive systems, television set-top-boxes, kiosks, mobile and handheld computers, portable media players, and more.

Windows Mobile is optimized for mobile devices, especially those with voice and data connections capabilities. In this capacity, the consistent user experience between desktop and mobile computing is highly desirable and is implemented by precisely controlling the software environment and feature set. To ensure the consistency across Windows Mobile devices, Windows Mobile has a prescriptive hardware configuration that is designed to enable a common hardware platform that allows 3rd party developers to develop applications. Beyond hardware, requirements include a stereo headphone jack, a voice recorder, a microphone, a notification LED, etc. While these features are important to some customers, they can represent the addition of unnecessary costs, unwanted features, and in some cases, functional compromises to vertically oriented devices.

Conversely, Windows CE gives the device manufacturer the power and flexibility to provide its customers with a computing device designed specifically for the application. Vertically oriented manufacturers use Windows Embedded components to build or assemble an operating system specific to the device. This customized architecture permits each vendor to optimize hardware, and focus on the components most relevant to the business application.

Jane Gilson, Director, Microsoft Windows Embedded Group said, "Windows CE provides a rich, complete and consistent set of development tools that enable a faster time to market, help customers develop cutting-edge devices and create long-term business strategies with ease. We offer reliable real-time capabilities that allow for a wide range of innovative devices."

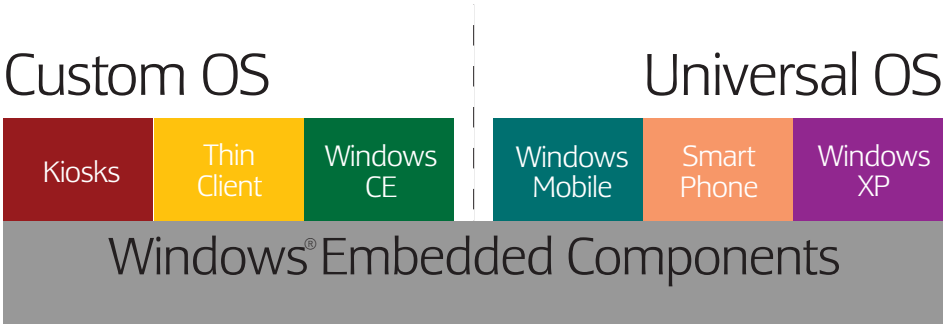

Figure 2: Windows Embedded Components

Microsoft Embedded Time Line

The Windows CE platform was first introduced in 1996, powering the early predecessors of today's PDAs and palm top or clamshell computing devices. With Windows CE 3.0 the operating system became more reliable, resulting in an increased level of acceptance from device manufacturers and started gaining market share against incumbents like DOS, Palm OS, EPOC, etc.

Because PDAs are typically battery powered, Windows Embedded tools strive for power conservation. In addition, the memory capacity of Windows Embedded devices is significantly smaller than desktop systems so the operating system was designed to minimize the memory requirements while providing programming compatibility with other versions of Windows. The key to Windows CE is the flexibility to customize and support a wide range of device types while tailor fitting the device operating system to be as small as possible.

In 2001, Microsoft introduced the first version of Pocket PC. The primary goal of Pocket PC was to create a consistent user experience across mobile computing device manufacturers. Pocket PC contained a highly regulated set of embedded applications and user interface components designed for PDAs. Pocket PC's Personal Information Management (PIM) functionality geared devices to be universally recognized.

In 2004, Microsoft announced an updated road map showing a higher level of convergence between Windows CE, .NET and Pocket PC 2003, which recently evolved into Windows Mobile. This change in approach affected the market for vertically focused and targeted devices such as the Falcon 4400 Series by providing two competitive operating systems.

In 2005, Microsoft introduced the new Windows embedded tools, and initiated the promotion of Windows Mobile 5.0 and Windows CE 5.0.

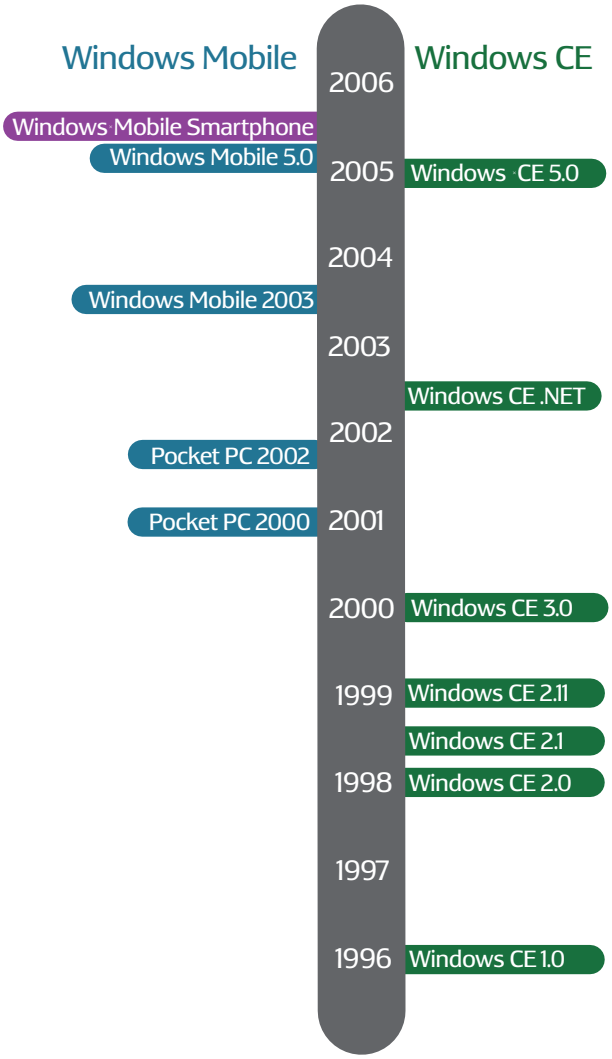

Figure 3: Microsoft Mobile Historical Time Line

Solutions

Microsoft continues to broaden the appeal of the Windows Mobile brand through enhanced marketing and greater platform flexibility. Microsoft continues to evolve the basic group of building blocks to strive for greater standardization, application integration and feature sets that will be attractive to the vertical market place as well as the horizontal one. However, the ability to create vertically oriented devices while providing advanced enterprise capabilities with a high degree of cross compatibility with Windows CE allows developers and end-customers to choose the solution that best meets their requirements.

For a visual representation of how these platforms differ, consider the building block analogy used earlier. In the box, there are varieties of pieces that assemble in many different ways. In the case of Windows CE, the selection of the pieces and features is up to the individual device producers. This flexibility keeps the operating system as "thin" as possible, provides both the device manufacturer, and in many cases the developers of these products a significant level of control over the device and its use. In cases where a security or end user productivity issue comes into play, Windows CE provides a very attractive solution. With flexibility and control comes a lack of implementation standardization between different vendors of these devices and in some instances, between product lines of the same vendor. This lack of standardization also prevents the use of standardized shrink-wrapped software applications.

"In the case of the Windows Mobile, which is built on Windows CE, Microsoft selects the building blocks and components used," said Chris Hill, group product manager, Microsoft Corporation. "This enables a standard platform, regardless of the hardware, giving users the same experience regardless of device or carrier and giving device makers, carriers, IT professionals and developers a similar support and development experience across devices. Like CE, however, customization still happens - device makers and mobile operators can add in layers of software on top of the platform to extend and differentiate their Windows Mobile offering ."

With the release of Windows CE 5.0 and Windows Mobile 5.0, these two products are much more closely related than ever before at a core technology level. This provides Microsoft and its development partners the ability to utilize common tools in developing applications and potentially supporting application sets on both variants.

Datalogic's Development

As Microsoft's marketing efforts have begun to focus on the Windows Mobile operating system, generating increased customer interest, Datalogic is responding effectively to these industry changes and takes pride in offering customers both Windows CE 5.0 and Windows Mobile 5.0. Datalogic has found that Windows CE and Windows Mobile share a strong heritage that results in far more inter-compatibility and interoperability than previously thought. This allows the customer more uncompromising options to tailor the best solution for their individual requirements.

Falcon Features and Benefits

Windows Mobile

FEATURES	BENEFITS
Microsoft standard	• Standard operating system components ensure ease of application portability between devices • Common user interfaces and desktops facilitate reduced training needs in mixed device environments
Flash based file system	• Secures data in permanent memory
Mobile Office	• Mobile versions of Word; Excel; Access; Power Point Viewer; Outlook; Internet Explorer
Security	• Enhanced security through provisioning and trust levels

Windows CE

FEATURES	BENEFITS
Optimized operating system	• Tailored OS minimizes space, enabling greater data capacity and faster boot times. • Ability to customize for unique end user requirements
Build in tools	• Microsoft WordPad; Excel Viewer; Internet Explorer
Object store	• Larger effective memory by combining RAM Object Store with Flash

Conclusion

The Datalogic Falcon product line offers both Windows CE and Windows Mobile operating systems. These options give end-users the power to choose the software and hardware technologies and feature-sets that best meet the individual requirements of their enterprise.

While Microsoft has created seemingly discrete lines of embedded operating systems, it is important to remember that Windows CE and Windows Mobile share a strong heritage. This heritage results in more inter-compatibility and inter-operability than would be expected, allowing the end user to pick the best solution based on requirements. Datalogic expects Microsoft to continue converging the basic group of building blocks, to strive for greater standardization, application integration, and feature sets that will be attractive to both vertical and consumer markets.