Comparison: Palm™ Handhelds VS. Windows CE 3.0

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The Palm™ Advantage

Palm™ is the computing standard with more than 70 percent market share worldwide according to a recent IDC study[1]. Palm OS®-compatible software programs outnumber those available for any other handheld operating system. With more than 5,000 software programs and over 500 hardware add-ons that cover everything from e-mail and Internet access to databases, complete enterprise solutions, spreadsheets, e-book readers, and of course games, Palm OS-powered systems are the most versatile and capable handhelds on the market.

The Palm OS is an open standard, ensuring that your customer's investment will be protected in the future. Some of the world's most innovative companies are signed up to make or sell Palm OS-compatible systems, including Sony, Nokia, IBM, and Handspring. The Palm OS platform is also supported by the leaders in enterprise software, including Oracle, Siebel, SAP, Lawson, Sun, and Sybase, as well as leaders in systems management software, including Computer Associates, Tivoli, and Peregrine.

Through these industry-leading alliance partners, Palm offers complete, comprehensive enterprise solutions, providing innovative organizations with a new way to gain a competitive advantage through better customer service, improved employee productivity, and timely access to mission critical information. Palm's mobile computing solutions provide superior mobility and breadth of application synchronization choices, an unmatched combination of higher ROI, lower overall costs, and superior investment protection into the future. Palm provides pioneering MIS/IT organizations with a flexible and customizable mobile computing platform and superior ease of use. Unlike Microsoft PocketPC* which focuses on offering a "PC in your pocket" with all its inherent complexities, Palm solutions are designed to best meet your customers' handheld computing needs.

Palm's success is founded on NOT trying to cram an entire PC into a pocket-size device. PCs are designed for information creation. Handhelds are designed for information access and management. By focusing on including all PC features in a handheld device, other companies diminish the handheld's battery life, increase cost, increase size, and ensure a level of complexity that makes these devices less useful.

The most important features in a handheld computing device are:

- Simplicity – Get all the information you need instantly

- Wearability – Carry it in a pocket or purse all day

- Mobility – Update your information via wireless or wireline connections, even when not at your desk.

Palm is the innovation leader in all three areas. The Palm Advantage may be the major reason why our install base doubled in 1999.

Microsoft Windows CE 3.0

The year 2000 will be an important year in many ways for Microsoft Corporation. A new version of Windows* CE is coming along with a new wave of Windows CE hardware. Some analysts have called this new product launch a last-ditch attempt by Microsoft in its attempt to be a player the handheld market.

Ghosts of the past

When Microsoft introduced Windows CE 2.0, which was adopted by a variety of hardware manufacturers to produce palm-size PCs, the operating system failed to garner much praise.

In fact, analysts and journalists savaged the OS with criticism. Consumers and IT managers seemed to agree; they stayed away in droves.

Why did this happen? Microsoft had tried to stuff a desktop OS into a handheld device but succeeded in creating the worst of both worlds – an OS not as functional as a desktop PC but too complex for a handheld.

In fact, two OEMs, Philips and Everex, abandoned the Windows CE platform. So Microsoft went back to the drawing boards.

The next generation

The next generation of handhelds running the new Windows CE 3.0 are scheduled to appear in April 2000. Microsoft refers to a device running the new OS as a "Windows-powered PocketPC."

Clearly, Microsoft is trying to position the PocketPC as a feature-rich, sophisticated device while dismissing Palm handhelds as simple organizers, ill-suited to working, web surfing, or playing digital media. In fact, many of features that Microsoft claims as breakthroughs – web browsing, Excel spreadsheets, e-reading – have been available for Palm™ handhelds for years.

Factors of Success

The success or failure of any handheld computing device depends on the answers to five key questions.

First, how well do the bundled applications work in a small, handheld form factor? If the handheld is too hard to use or if the applications are difficult to see on a small screen, the device may demo well-but fail in everyday use.

Second, has battery life been sacrificed for extra features? Handhelds hungry for battery power will require the user to carry additional batteries or worse be tied to a power outlet, directly impacting mobility. If Microsoft has sacrificed battery economy for features such as color screen, web surfing, and an MP3 player, users are in for a big disappointment.

Third, are people willing to pay for bundled features they may not need? With Microsoft they don't have a choice. Microsoft will justify the price of Windows CE 3.0-based handhelds citing versatility. Consumers may not want to pay for these additional features they may never use. If that is the case, a Windows CE 3.0 handheld may not be the best choice for the customer.

Fourth, will the operating system win the hearts and minds of developers? Windows CE didn't do so before and without a large community of developers creating new applications, Windows CE 3.0 will be an island in the stream. And users will be stranded there. In contrast, the Palm OS® has more than 55,000 developers and 5,000 software applications.

Fifth, are expansion options available for the handheld? The only expansion technology Microsoft has announced is Compact Flash. Will developers jump on board? By comparison, Palm users can choose multiple expansion technologies, enabling over 500 expansion options, with more on the way everyday.

The name says it all

Microsoft claims that putting a PC in your pocket is a good thing. At first glance, this concept may seem intriguing for retail consumers and IT managers alike. When viewed with an eye toward simplicity, wearability, and mobility the most important features of the Windows CE 3.0 don't stand up. It's more complex to operate and the lack of add-on software and hardware limits the customer's choices.

Palm vs. Windows CE 3.0 Comparison Chart

Feature	Palm™ Handhelds	Windows CE 3.0 Devices	Summary
User Interface	Simple, intuitive	Complex, modeled after Windows	Cosmetic changes to the Windows CE OS may make it more confusing than ever. It looks like Windows, but isn't. Palm™ handhelds are still the simplest.
Supports Faster Processor Speed	No hourglass cursors. Just fast, one-touch access to all data.	Hourglass cursors	More software lets users do more. A faster processor just eats battery life.
Memory	Efficient OS does not require huge amounts of memory, saves battery life.	Larger OS requires more memory and uses more battery power	Large amounts of memory use more battery power and cost more. The efficient Palm OS® does not compromise battery life for increased memory.
Battery Life	Weeks of battery life	N/A	Palm's efficient OS results in longer battery life.
Word and Excel File Support	Yes, via third party programs for the Palm OS.	Yes	The cost of a Palm handheld plus third-party software is less than the cost of a comparable Windows CE 3.0 handheld. Plus with Palm, users can choose which application suits their needs best.
Web Browsing	Third-party browsers are available. The Palm OS platform also supports WAP and web clipping.	Bundled with AvantGO	Palm currently includes AvantGo with many of its handhelds. The slow wireless bandwidth of handhelds is not suitable for HTML browsing, making this additional feature unusable in the Windows CE 3.0 handhelds.
E-book Reader and Readability	Advanced LCD screen technology. More than one dozen third-party readers are available as well as thousands of titles.	ClearType technology	High-contrast Palm handheld screens aid readability more than ClearType.
Voice Capture	Third party voice capture covers for the Palm III and Palm V series are available.	Built-in	With the Windows CE 3.0 handhelds, users pay the cost and weight penalty for this feature whether or not they use it.
Expansion Capabilities	Compact Flash, external add-ons, Springboard slot from Handspring.	Compact Flash	Palm OS-compatible applications are relatively small and do not normally require expansion capabilities. If users are storing large databases, TRG's Compact Flash solution is ideal.
Development Support	Over 55,000 developers, 5,000 applications, and 500 hardware add-ons.	No information available	Of the 50 most popular software titles available for Palm OS handhelds, only four are available for the Windows CE 3.0 handheld.

Frequently Asked Questions

Overview

Q. What are the key advantages of buying a Palm™ handheld vs. a Windows CE-based handheld?

A. Simplicity. Mobility. Wearability. Palm™ is the leader in all these areas. Palm™ handhelds are designed to give users the information they need instantly, without waiting. Palm handhelds are small enough and light enough that you can carry them in your pocket or purse all day. And users can always update their information through wireless and wired connections, even when they're not at their desk.

Windows CE is more complicated to operate and the lack of third party software and hardware for this platform limits customer choices. The system is very complex to configure and use. Many of the features promoted in Windows CE make the product slow and heavy – not very practical for mobile users. And very few hardware and software developers are supporting Windows CE. This lack of support limits flexibility and customer choice.

Q. Can both Palm and Windows CE operating systems be upgraded?

A. Palm OS® upgrades are installed through software users can download themselves, over the web.

Windows CE hardware companies might offer ROM upgrades. If upgrades are offered, users will have to send away for the hardware and then either install it themselves or take the system to a store for installation. This procedure is a huge fuss.

Q. Isn't Windows CE better because it has more features?

A. No. The extra features that are crammed into Windows CE-based handhelds create more problems than benefits.

For example, adding color to some Window CE-based handhelds has meant adding so much weight that the devices can no longer fit comfortably in the user's pocket or purse. This increased size defeats the whole purpose of handhelds. By comparison, the Palm IIIc handhelds offer a color screen without compromising size and weight.

Many Windows CE features also seem to be aimed more at creating nice demos than something users can actually use. For example, playing back videos isn't very useful when the memory of the system can hold only a few minutes of video. Windows CE users can, of course, store video on a Compact Flash hard drive, but the same drive consumes batteries so fast that the system goes dead quickly.

In contrast, Palm OS-based handhelds have superior battery life, fit neatly into a pocket or purse, and are supported by more than 55,000 solutions providers, offering tremendous flexibility and customization options.

Essentially, Windows CE users are forced to pay a higher cost and a greater weight penalty for features they may never use.

Q. Do Windows CE-based systems have an edge over Palm OS® systems because of their expandable Compact Flash slot?

A. No. The Palm™ handheld family has more than 500 clip-on expansion modules and therefore offers more expansion options than Windows CE 3.0 handhelds.

Palm, Inc. licensees are offering other internal expansion features as well. For example, TRG's Palm OS®-based systems have Compact Flash. The Handspring Visor handheld offers the Springboard expansion slot. In addition, Sony has announced that it will build its Memory Stick expansion architecture into future Palm OS handhelds. The Palm OS handheld family, unlike Windows CE, gives users the option to choose which expansion option are right for them.

Q. How many hardware companies are integrating the Windows CE operating system into their products?

A. The number is decreasing. When Windows CE was first introduced, seven companies were signed up to make keyboardless Windows CE-based handhelds: Casio, Everex, LG Electronics, Palmax, Phillips, Samsung, and Uniden.

Today, only Casio is still shipping Windows CE handhelds. Even though Compaq and Hewlett Packard signed on later, there are still fewer Windows CE-based handheld vendors today then there were when the operating system was initially launched.

Q. Isn't it easier to port Windows applications to Windows CE-based systems?

A. No. Windows CE doesn't run Windows applications, and these applications require substantial modification and recompilation to move to Windows CE. Very few Windows programs have been recompiled to run on Windows CE systems, especially on the handheld version.

Q. How attractive is the Windows CE voice memo capture feature to handheld users?

A. If Palm handheld users want voice capture, it is available as a clip-on for the Palm III and Palm V series handhelds or as a voice capture module for the Handspring Visor. Palm, Inc. and its licensees to date have chosen not to add voice memo capability as a standard feature because it adds too much cost and complexity for a feature that most users don't use.

Palm OS® in the Enterprise

Q. Does Palm, Inc. offer a viable solution for accessing corporate e-mail?

A. Yes. Palm, Inc. believes in supporting all of the leading enterprise messaging solutions. This support allows easy integration not only with Microsoft Exchange, but also with other leading e-mail applications such as Lotus Notes, Lotus cc:Mail, and Eudora. In contrast, Windows CE 3.0 interacts only with Microsoft Outlook.

Palm™ handhelds support Microsoft Exchange right out of the box. E-mail synchronization is also supported on all Palm OS®-enabled products. Other mail servers are supported through these third-party solutions:

- BeamLink
- EasySync for Lotus Notes
- Eudora
- Intellisync for the Palm Computing Platform
- MultiMail Conduit
- MultiMail PRO
- One-Touch Mail
- Palmeta Mail
- ProxiMail

Support for file attachments is available through third-party solution providers such as MultiMail,
JP Systems, On Technology, and Dataviz

Q. Doesn't Windows CE 3.0 offer greater enterprise security than Palm?

A. No. Palm, Inc. has been working for years with third-party solutions providers to ensure the availability
of a complete enterprise offering. For instance, the Palm VII handheld includes PKI support for wireless
security capabilities. This support includes transmission encryption that goes far beyond what
Windows CE 3.0 can do today.

Palm's world-class security solution includes: 1) Device-level security through signature, password, and
key strokes; 2) Challenge response; and 3) SSL, VPN, or leased-line access behind firewalls. In addition,
Palm's comprehensive security solutions include support for a wide range of third-party solutions,
including:

- Cryptinfo
- E.ID for the Palm Computing Platform
- Enforcer
- Jaws Memo
- JotLoc
- Lock Me!
- Login Script Enhancement
- OnlyMe – Access Security
- Restrictor
- Secret
- Secure Memo Pad
- SecurID for the Palm Computing Platform
- Sign-On
- SSL Plus for the Palm Computing Platform
- TealLock

Moreover, Palm, Inc. has established a relationship with Certicom, a leading provider of next-generation
encryption technology used to build strong, fast, and efficient security solutions.

Q. Do Windows CE 3.0-based handhelds offer organizations greater flexibility and handheld choice?

A. No. With more than 70 percent market share worldwide, Palm™ is the pervasive choice in handheld
computing. Palm offers true enterprise choice for many different perspectives, including operating
system, hardware, middleware, enterprise applications, and so on.

Palm has secured a number of key licensees that extend the Palm OS® to new areas. These licensees
include Symbol, Qualcomm, TRG, Handspring, Nokia, and Sony. Our OEM partners include Franklin
Covey, Supra Company, and IBM. All of these products are powered by the Palm OS.

This tremendous mix of hardware partners gives enterprise organizations incredible flexibility. Organizations can choose from a range of handhelds or mix and match based on their own unique requirements. All of these devices are supported by Palm's system management alliances, including Computer Associates, Tivoli, and Palm's own HotSync® Server technology.

With more than 55,000 solutions providers and 5,000 applications, Palm OS-based handhelds provide greater flexibility and customization options for any enterprise organization.

Q. IT organizations are concerned with Total Cost of Ownership (TCO). How do Palm™ handhelds compare with the competition in this area ?

A. The superior reliability and clean integration between Palm handhelds and enterprise software solutions means that organizations can expect fewer support calls, which translates into lower overall IT costs and a stronger bottom line for the enterprise.

Windows CE 3.0-based devices require a processor and memory component to support the Windows CE operating system, making acquisition costs significantly higher and impacting IT overhead costs.

Sample Palm OS®-Compatible Software Solutions

Category		Application Description
Contact Schedule and Groupware	ACT! Palm Link 1.0 by Symantec	Make your ACT! data portable and instantly available with the ACT! Palm Link. One-touch synchronizing allows you to link with your Palm™ handheld and take your contacts, schedule, and to do's with you. When you return to the office, simply synchronize your updated data back into your ACT! database. With ACT! and the Palm handheld, your contact data is always with you anytime, anywhere.
	Desktop To Go v2.5 by Dataviz	Synchronize Microsoft Outlook 97/98/2000 or Schedule+ directly with your Palm OS® handheld. Powerful features include category synchronization, Public and non-default Outlook folder support, custom field mapping, private record filtering, "priority" phone list synchronization, space-saving calendar and task filtering, and more.
	Lotus Notes 5.0 by Lotus Development Corp.	Control your contacts, your time, and your information. Lotus Organizer 5.0 is a major new release with more than 35 million users. The all-new Contact Section stores information, including contact history. Includes one-click auto-dialing, e-mail or Web access. Schedule group meetings over the Internet. Plan your trip with the OAG Travel Information System. Lotus Organizer 5.0 synchronizes calendar, contacts, tasks, and memo information with any Palm connected organizers.
	EasySync for Lotus Notes by Lotus Development Corp.	EasySync for Lotus Notes provides bi-directional data synchronization between Lotus Notes and personal digital assistants (PDAs) from IBM and 3Com Corporation. EasySync enables Notes users to take their Notes Mail, Calendar & Schedule, To Do lists, Address Book (Directory), and Journal entries wherever they go.
E-Mail and Communications	MultiMail PRO by Actual Software	MultiMail is the ultimate Internet e-mail client for your Palm OS® handheld. Allows you to send and receive your e-mail directly with a modem. MultiMail supports standard Internet e-mail protocols of IMAP4, POP3, and SMTP. Unique plug-in architecture allows attachment viewing. Optional conduits available for both Macintosh and Windows platforms.

Category		Application Description
E-Mail and Communications, cont'd.	One-Touch Communicator by JP Systems	JP System new innovation: One-Touch Communicator boasts advanced (SMTP/POP3) e-mail features so that you can manage your e-mail account even when you are on the road. You can use up to six different e-mail accounts to conveniently manage your ISP e-mail from your Palm OS handheld. The unique ability of One-Touch Communicator to send attachments right from the palm of your hand takes you to a whole new level of possibilities. With this feature you can attach regular text or memos as well as Contacts and Calendars using vCard and vCalendar formats. When users receives a vCard or vCalendar; they can place it directly into their address book or calendar without reentering the information.
	Palmeta Mail by Palmeta Software Company	Send and receive e-mail every time you synchronize with your Palm OS handheld. Palmeta Mail integrates the Palm Memo Pad with your PC's inbox/ outbox. Works with Netscape Mail or any MAPI e-mail system (Windows 95 Exchange, Windows Messaging, Outlook 97, Lotus Notes v4.x, Eudora Pro v3.0, Novell GroupWise5).
Enterprise Applications	Sybase SQL Anywhere Studio by Sybase	SQL Anywhere Studio provides the first ultra-small database that resides locally on multiple Palm™ handhelds. The MobiLink server synchronization technology allows users to seamlessly synchronize data with any enterprise database, including Sybase, Oracle, and Microsoft.
	Oracle 8i Lite by Oracle Corporation	Oracle brings powerful enterprise connectivity to the Palm OS® platform. Oracle's proven database technology handles data storage and data replication between multiple Palm handhelds and Oracle database servers.
	Remedy Link by Remedy Corporation	Remedy Link for the Palm OS platform enables mobile IT professionals with Palm OS-based handhelds to access all relevant data from the Action Request System (AR System). The Remedy solution provides workers with remote access to information when and where they need it, accelerating support processes while improving operational efficiency and mobility. As a component of the AR System, Remedy Link for the Palm OS platform is ideal for ticket-intensive mobile activity while remaining flexible enough to support a variety of business functions.

Category		Application Description
Games and Entertainment	Tiger Woods PGA Tour by EA Sports	Tiger Woods brings his games to the Palm OS® platform. Three exciting game modes included: Stroke/Practice, Tournament, and Fast Play. Play as yourself, as Tiger Woods or as one of seven other PGA TOUR® Pros: Peter Jacobsen, Tom Kite, Davis Love III, Craig Stadler, Lee Janzen, Mark O'Meara, or Brad Faxon. Tee off at one of three world-class 18-hole PGA TOUR courses: TPC at Summerlin, TPC at Sawgrass, and Badlands Golf Club.
	Galax by PilotFan	Based on the well known classic, Galax has tried to recapture the feel and sprit of the original with great sounds, razor-sharp controls, diving aliens and extra men at 10,000 points.
	Backgammon for Palm OS by Stand Alone, Inc.	This is the most powerful backgammon game available for the Palm OS. It has complete game statistics, a doubling cube, and a computer opponent with four skill levels. You can choose which color to play, decide to play against the handheld or another human, and set the handheld's skill level from the settings screen. Backgammon for the Palm OS keeps track of the statistics of all of your games, so you can keep track of your victories.
	Invaders by Mobile Generation Software	Invaders for the Palm OS is strikingly similar to the popular 1980's arcade game, Space Invaders. We have recovered the software from the early Palm archives, added COLOR and made it available to all Palm OS users for free. Basically, the goal is to shoot down all the invading aliens before they destroy you.

This chart represents only a small percentage of third-party applications and solutions available for Palm OS-based handhelds. There are more than 55,000 developers and 5,000 applications are available for the Palm OS® platform.

Please visit www.palm.com for a complete listing.

1 "Smart Handheld Devices. Pocketful of Palms: The Smart Handheld Devices Market Forecast Update and outlook, 1999-2000." December 1999. International Data Corp.