



Tablet PC: An Overview

White Paper

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For the latest information, please see <http://www.microsoft.com/windowsxp/tabletpc/>

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Introduction

The Tablet PC is a next-generation PC—the evolution of the notebook PC. Running the Microsoft® Windows® XP Tablet PC Edition operating system, which is a superset of Windows XP Professional, the Tablet PC provides all the performance and features of today's notebook PCs, and then some. Advanced handwriting and speech recognition capabilities, a natural interface for entering data using a digital pen in addition to your keyboard, an ultra-light form factor, the ability to run full versions of standard Windows applications--these and other features of the Tablet PC open exciting new options for mobile computing.

This paper provides an overview of Windows XP Tablet PC Edition features, the multiple Tablet PC form factors available from original equipment manufacturers (OEMs), and considerations for deploying the Tablet PC in the enterprise.

Driving a New Generation of PC

Notebook PCs have been among the fastest growing category of computing devices, and for good reason.

Increasingly, more and more users spend time away from their desks, whether they are “road warriors,” such as sales managers or senior executives who travel frequently, or “corridor warriors,” who spend hours a day in the office but are away from their desks attending meetings.

In spite of the productivity benefits of today’s notebook PCs, typical mobile workers often spend a significant amount of time gathering and distributing information on paper. Microsoft research indicates that the typical manager or knowledge worker attends 40 meetings a month or more and jots down literally hundreds of notes on paper. Whether it’s a phone number, a tentative date for the next meeting, or notes on a presentation, knowledge workers spend many hours manually transcribing and merging handwritten information with computer-based applications.

A major reason knowledge workers spend time transcribing paper-based notes is the simple fact that they do not have PCs with them in key situations throughout the business day. Desktops are immobile and even notebook PCs are routinely not used in business meetings. One reason for this is the negative social aspect associated with laptop use in meetings. The clicking of keyboards can be distracting and the presence of an open laptop screen often creates a literal and figurative barrier between the user and others in the room, which impedes communication.

The Tablet PC’s light weight and innovative form factor overcome such barriers. The mobility and versatility of the Tablet PC enables users take their PCs with them and use them in new places and in new ways.

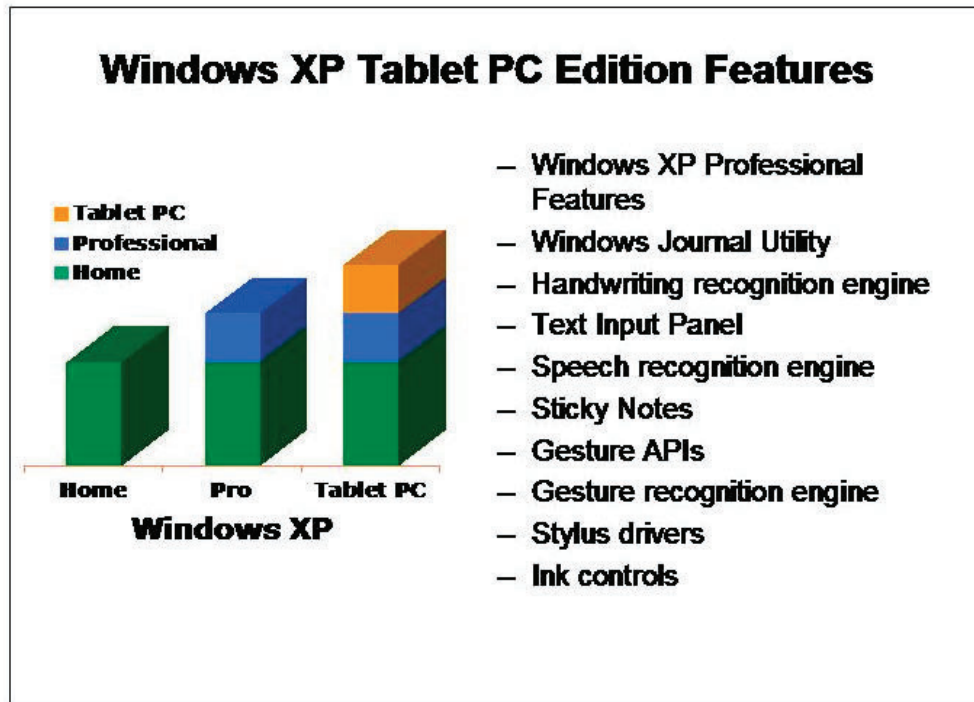
Tablet PC: The Next-Generation Mobile PC

In response to the evolving needs of computer users, Microsoft and its hardware partners have developed the Tablet PC, a next-generation mobile business PC that will be available from leading computer makers in the second half of 2002. Tablet PCs are full-featured laptops running the Windows XP Tablet PC Edition operating system. The Tablet PC has all the capabilities of current business-class laptops, including attached or detachable keyboards, docking stations that enable the use of common peripheral devices such as CD ROM drives, printers, and external monitors, and the ability to run all Windows-based applications, including Microsoft Office XP suite. Microsoft is partnering with a range of hardware vendors, including ACER, Compaq, Fujitsu, NEC, Toshiba, and ViewSonic, among others, to manufacture Tablet PCs running Windows XP Tablet PC Edition. Tablet PCs will be offered in a variety of form factors. Some will be “pure tablets” without an integrated keyboard while others will be “convertible” tablets with more conventional clamshell laptop designs. Convertibles will be equipped with rotating screens that allow them to convert to a tablet. All Tablet PCs will be very light—ranging from two to three pounds—and will have all the features needed by mobile users, including long battery life, great displays, networking capability, and integrated support for peripherals through USB or FireWire ports. Tablet PCs will also support docking stations and a variety of external peripherals.

The following provides a closer look at specific features of the Windows XP Tablet PC Edition operating system.

Built on Windows XP Professional

Windows XP Tablet PC Edition is a complete superset of Windows XP Professional, delivering the features and performance of the latest Microsoft operating system for PCs, while offering additional capabilities that deliver enhanced performance to the user. The following chart illustrates the foundation on which the Tablet PC platform was designed and the added features it offers, including advanced handwriting and speech recognition, rich inking capabilities, and features that enhance mobility.



The Tablet PC is an enhanced version of the Windows XP Professional operating system, offering the features of Windows XP Professional and more.

Digital Ink and Pen-Based Input

The ink used in Windows XP Tablet PC Edition is far more advanced than a simple image file, such as a bitmap, and is the product of significant research by Microsoft. Ink is stored as a series of complex equations called Bezier curves. This allows digital ink to have a very small file size and facilitates efficient storage of ink files. As a result of years of technical and usability research, the ink used in Windows XP Tablet PC Edition flows smoothly and rapidly on the screen. This makes using ink with a Tablet PC a natural experience for the user.

Tablet PC users will be able to operate their computers using a digital pen in addition to traditional input methods, such as a keyboard or mouse. The pen can also be used for the same functions as a mouse, including navigating user interfaces, selecting tools from menu bars, moving and resizing objects, and activating programs. As with physical pens, users can select the color and thickness as well as use emphasis tools, such as bolding and highlighting.

The Tablet PC's writing surface is roughly the size of a standard paper notebook, and users can rest their hand on the screen while writing or running software applications. This is a natural way to use a Tablet PC, but requires careful design to enable a great user experience. Tablet PCs have therefore been designed to operate with an

electromagnetic digitizer instead of a resistive-touch screen such as those typically found in PDAs and other devices with small screens. An electromagnetic digitizer accepts input from a special pen containing an electromagnetic coil.

The electromagnetic digitizer enhances the inking experience by preventing contact between the user's hand and the screen from inadvertently moving the cursor. It also enhances screen life by enabling the user to move the cursor without making direct physical contact with the screen surface. This "hovering" ability also lets the user move the cursor quickly and easily.

From a technical perspective, the process of inking and pen-based input occurs in the following three steps: Windows XP Tablet PC Edition operating system captures pen motion coordinates on the screen, renders and stores the pen motion as "ink," and then passes these groups of pen strokes to a "recognizer," which in turn interprets them as writing.

Tablet PC also includes support for gestures. By making a gesture on the screen with the pen, the user can execute many different commands. Gestures can be used for a variety of common actions or commands and can be invoked by making an ink mark with the pen in one or more locations on the Tablet PC screen.

A Powerful Platform

The Tablet PC is a powerful platform that offers opportunities for developers to add ink, pen, and speech capabilities to their existing and new applications. Windows XP Tablet PC Edition is the first version of Windows to be built with the Microsoft .NET Framework, which is included with every version of Windows XP Tablet PC Edition. This tool for developing ink- and speech-enabled applications as well as the Tablet PC Platform Software Development Kit (available on the Microsoft Developer Network) will help developers take advantage of the Tablet PC platform by integrating ink and pen support into new or existing Windows applications.

Microsoft is partnering with specific industry leading software companies, including Adobe Systems, Inc., Autodesk, Inc., Corel Corporation, and LexisNexis, to offer Tablet PC-compatible software, with full pen and ink capabilities, in their future releases.

Microsoft will offer users the Office XP Pack for Tablet PC. This free download available to Tablet PC customers extends pen and ink functionality to the core Office XP applications (Microsoft Outlook®, Word, PowerPoint®, and Excel).

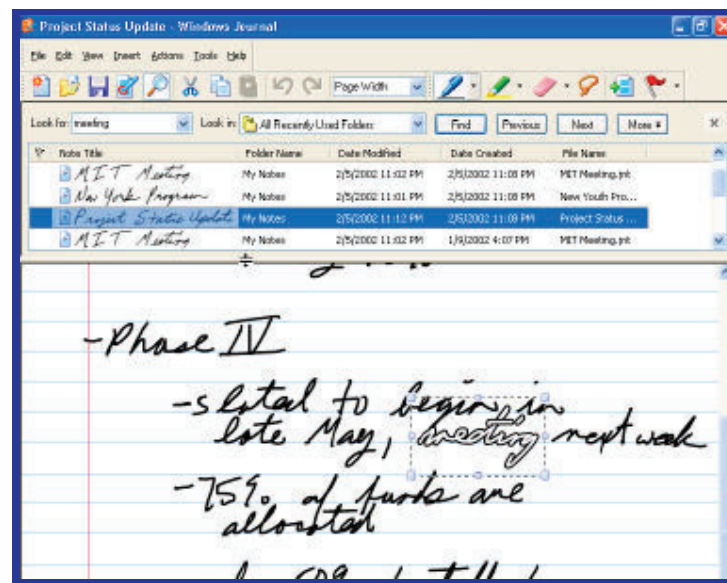
Windows Journal

Windows Journal is a new note-taking utility that is only available in Windows XP Tablet PC Edition. Designed from inception to take advantage of the unique capabilities and power of the Tablet PC platform, Windows Journal lets users write notes in their own handwriting in the same way that people write notes with pen and paper.

However, because the ink is an actual data object and not just a picture or image file, users can convert their handwriting to text and can enter text into notes. Users can also draw and include graphical files in notes.

Furthermore, because Windows Journal performs background handwriting recognition on ink, the user can quickly and easily search through the handwritten ink files stored on a Tablet PC hard drive. In this way, Windows Journal is not just an electronic reproduction of pen and paper. Instead, Windows Journal uses the power of the PC to complete useful tasks that are difficult or impossible with paper alone.

Features of Windows Journal include erasing, highlighting, formatting text, inserting space, dragging and dropping ink, recognizing and converting shapes, and formatting lists. In many organizations, notes are taken in forms. Windows Journal supports a variety of background images and stationery. Some types of stationery are purely decorative, such as college-lined paper versus wide-ruled or grid paper. Other stationery can be made to resemble traditional forms to facilitate the electronic completion of forms. With the optional Office XP Pack for Tablet PC, users will be able to use Windows Journal to complete the common task of inserting key meeting information, such as subject, date, and attendees into meeting notes. For meetings that are present on a Microsoft Outlook calendar, a user can select the relevant meeting and add its information as text directly into the active Windows Journal note with a few strokes of the pen.



The top of the first page of each Windows Journal note file is a space to write in a title. The file is saved as a Windows file, and its default Windows file system name is the recognized text of what is written in the title area.

Windows Journal users can take notes on multiple pages just as they would in Microsoft Word and then save those pages as a note file. The notes can be printed, copied, and deleted just like any file in Windows.

As a user takes notes, Windows Journal also performs handwriting recognition in the background enabling the user to search across all her note files in real time. Because the recognized text is stored in the background, users can accurately search for specific text in their handwritten notes—either within a note, across all notes

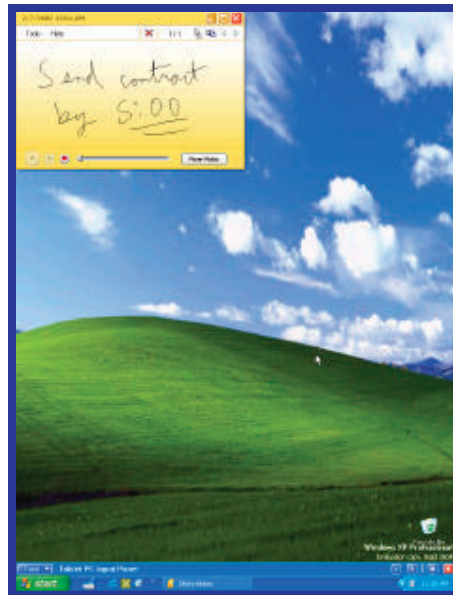
within a folder, or across all notes stored on their Tablet PC hard drive. The search engine in Tablet PC searches the recognized text with accurate results.

Speech Recognition

Speech recognition is an integral component of every Tablet PC, allowing users to dictate content or control applications with their voice. An external microphone is required in most cases. The Tablet PC Platform Software Development Kit (SDK) includes the Microsoft Speech API (SAPI), which can be used to extend speech capabilities to third-party applications.

Sticky Notes

Windows XP Tablet PC Edition also includes the Sticky Notes utility. This allows users to jot down short notes and place them on the desktop in a simple and easily accessible manner.



A Sticky Note attached to your desktop works great for quick reminders. You don't have to open an application—you see important messages right on your desktop.

Sticky Notes can be dragged into applications that use Object Linking and Embedding (OLE) technology, such as Microsoft Word, PowerPoint, and Excel. When dragged into another application, an image of the note is pasted into that application.

Screen Rotation

Tablet PC supports instant display rotation between portrait and landscape modes without requiring a reboot, so a user can work in either mode according to his preference. For example, when annotating PowerPoint slides, it may be preferable to work in landscape mode—the same orientation as most PowerPoint slides. However, when taking notes in Windows Journal, it is more natural to do so in portrait mode—just like taking notes in a paper notebook. Tablet PC screen displays rotate almost instantly, so the user can go back and forth as often as desired or needed for a specific task.

Support for Multiple Languages

Windows XP Tablet PC Edition will offer handwriting recognition support for multiple languages including English, German, French, Japanese, Chinese (Traditional and Simplified), and Korean. Handwriting support for additional languages is under development. Windows XP Tablet PC Edition also supports the Windows XP Multilingual User Interface (MUI), which lets users change dialog boxes, menus, help files, dictionaries, and proofing tools for each user's language.

Tablet PC and the Enterprise

Tablet PC is ideally suited for mobile users who currently use notebook PCs and who can benefit from the enhanced mobility and versatility. Because it is built on Windows XP Professional, the Tablet PC provides the same performance and support components provided by Windows XP Professional.

Highlights of interest to enterprise customers include:

Deployment—Tablet PCs are deployed **just like any other Windows XP-based PC**, including distribution in heterogeneous computing environments.

Full PC—Tablet PCs **run all Windows applications**, including standard applications such as the Microsoft Office XP suite as well as custom line-of-business Windows applications.

Docking—All Tablet PC hardware packages will **include docking stations** that enable the use of standard peripherals. The Tablet PC platform is designed to enable fast docking and undocking without rebooting or requiring additional undocking actions.

Learning tools—All Tablet PCs will include **online tutorials** so users can quickly familiarize themselves with using the new features of the platform.

For more detailed enterprise-related information, please refer to the [Tablet PC and the Enterprise](#) white paper.

Conclusion

The Tablet PC is the most powerful, mobile, and versatile PC yet. Its operating system—Windows XP Tablet PC Edition—is built on the strong foundation of Windows XP Professional and offers significant new features that let people use their PC in new places and in new ways. Combining the versatility and flexibility of pen and paper with the power of the PC, Tablet PCs will create a broad new category of notebook PCs for highly mobile users. Using the Tablet PC, users can operate Windows software applications using a pen, annotate documents with digital ink, create handwritten documents using digital ink for later reference, share these documents with co-workers, and convert handwritten notes to text. Tablet PCs will support the scenarios of today's notebook PCs, including the use of docking stations, external monitors, mice and external keyboards. In addition, Tablet PCs offer light weight, long battery life, high-resolution displays, and seamless support for wireless connectivity.

The Tablet PCs power, mobility, and versatility will enable knowledge workers to employ the power of their mobile computers in more places and in new ways throughout the day, helping to make them more efficient than ever before.

For more information about the Tablet PC, see <http://www.microsoft.com/windowsxp/tabletpc>.

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