

Windows XP: Finding the Right Fit

Windows XP Professional or Windows XP Embedded

Trying to decide which OS to use in your next device?

One of the dilemmas facing smart device makers is how to select the best operating system for their device.

Sometimes the choice is obvious, like using Microsoft® Windows® XP Professional for a general-purpose PC. But what if you had to pick an operating system for an information kiosk that houses a PC, but requires reliability and low maintenance costs? Would you use Windows XP Professional or Windows XP Embedded?

Let BSQUARE Guide You

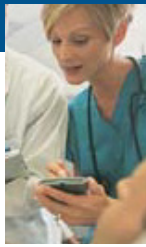
With more than 10 years of experience with Windows Embedded technology, BSQUARE can expertly guide you to the best operating system for your device.

Our firsthand knowledge of Windows Embedded systems integration gives us unique insights into the device development process, which translates into carefully crafted licensing strategies for you.

Don't handicap your device by selecting an operating system that doesn't fit. Pick the right Windows OS, and ensure the success of your device from the start.

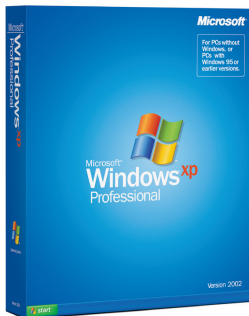


A Two-Step Decision Process



BSQUARE has assisted hundreds of companies in the evaluation and selection of Windows Embedded and Windows Classic operating systems for embedded devices. Our licensing experts always advise OEM customers to start with a simple two-step decision process:

- First determine if the technical features required for the type of device you are developing are available with the Windows XP Professional or the Windows XP Embedded operating systems.
- If both operating systems meet your technical needs, then compare the business requirements for each option by analyzing the fixed and variable project costs.



Meet Windows XP Professional

Windows XP Professional turns every PC into a powerful and flexible tool that can be used for a wide range of purposes. This operating system is designed for businesses of all sizes and for users who demand the most from their computing experience.

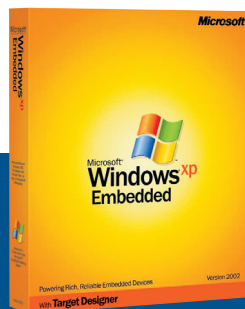
Windows XP Professional delivers the new standard in reliability and performance for PCs. Computers running Windows XP Professional outperform Windows 98 Second Edition, and meet the performance of Windows 2000 on commercial benchmarks. Applications launch quicker, system stability is higher, security is better, and the PC is easier to use than with earlier versions of Windows.

Meet Windows XP Embedded

Windows XP Embedded is the embedded operating system that delivers the power of Windows XP in componentized form and enables developers to rapidly build reliable and advanced embedded devices. Any application that runs on Windows XP Professional can be built into a Windows XP Embedded device.

Based on the same binaries as Windows XP Professional, Windows XP Embedded contains over 10,000 individual feature components so developers can choose and achieve optimum functionality while managing or reducing footprint in a customized device image.

Windows XP Embedded also provides the latest multimedia and Web browsing capabilities plus incorporates embedded-enabling capabilities, such as support for multiple boot, storage, deployment and management technologies.



What Kind of Device Are You Making?

The features and functionality required for a specific device can help you choose between Windows XP Professional and Windows XP Embedded. Here are some general guidelines:



- Windows XP Professional is ideal for general-purpose personal computers and PC-based devices that require powerful full functionality for a wide range of tasks.



- Special-purpose devices, such as advanced set-top boxes and retail point-of-sale clients, require the latest security and reliability features, as well as familiar and powerful Windows features, making Windows XP Embedded the recommended OS. Other target devices include game platforms, gateway/media store, kiosks/ATMs, industrial automation, network devices, office automation and thin clients.

Development Tools

Application development is the same for Windows XP Embedded as for Windows XP Professional. Whichever you choose, you can leverage the knowledge and expertise of more than six million developers worldwide who are using Visual Studio® .NET for rapid application development.

Application Development with Visual Studio .NET

Visual Studio .NET is the comprehensive, multi-language development tool for rapidly building and integrating XML Web services and applications. Visual Studio .NET offers four programming languages and associated development environments:

- **Visual Basic .NET**, the latest version of the world's most popular development tool and language
- **Visual C++ .NET**, the tool of maximum power and control for building both native Windows-based and .NET-connected solutions
- **Visual C# .NET**, the modern and innovative programming language and tool.
- **Visual J# .NET**, the Java-language tool for Microsoft .NET

Platform Development with Windows Embedded Studio

Microsoft Windows Embedded Studio is a set of development tools used to create custom Windows XP Embedded operating system images. The central tool in the Windows Embedded Studio is Target Designer, which enables you to build a customized OS quickly using a simple drag and drop UI, automated task lists, automated dependency checking, and design templates for fast design starts on common design categories.

Other rapid platform development tools include Target Analyzer, which diagnoses your target hardware and builds all the necessary support into the OS, and Component Designer, which converts regular Windows XP Professional applications and drivers into Windows XP Embedded components.

What Features Do You Need?

General Purpose User Flexibility?

Windows XP Professional is the operating system of choice for general purpose devices enabling a wide range of end-user scenarios. With Windows XP Professional, the user decides what the device is used for whenever they use a particular application. New and updated applications can be easily installed, as can new peripheral devices and networking configurations. **If you are developing a PC-like device that will be used in different ways by different users, you'll want to choose Windows XP Professional.**

Compact OS Footprint?

Windows XP Embedded offers a significant advantage on devices where the OS footprint is a concern, since the typical XP Embedded runtime is a fraction of the size of a typical Windows XP Professional installation. A bare-bones Windows XP Embedded image can run as small as 8 MB, compared to some 1.6 GB required for Windows XP Professional. This reduced footprint inherently provides you with greater security and contributes to faster boot and log-on time. **If you are developing a device that requires a small OS footprint, you'll want to choose Windows XP Embedded.**

Rugged? Disk Free? Tamper Proof?

Windows XP Embedded is not just an embedded version of Windows XP Professional; it also offers a number

of unique capabilities that can be valuable for dedicated devices. **If you are developing a device that requires any of the capabilities listed below, you'll want to choose Windows XP Embedded.**

- **Disk-free operation:** A Windows XP Embedded device can be built with no hard drive, improving reliability and reducing hardware maintenance costs.
- **Flexible Booting:** Windows XP Embedded can boot from CD or DVD-ROM, Flash ROM or battery-backed RAM, or even remotely over a network. These options allow for tight control, consistent boot sequences, and well managed upgrade processes.
- **Locked-down Interface:** Windows XP Embedded enables tight control over access to OS components, such as the Control Panel, and allows you to replace the Windows Shell with a custom interface. This provides protection from accidental or malicious user re-configuration.
- **Remote Device Management:** In addition to the remote management tools included in Windows XP Professional, Windows XP Embedded includes a special tool called Device Update Agent that enables remote servicing and updating of deployed Windows XP Embedded images.

Extended Service Life?

Microsoft recognizes that embedded device makers need longer OS support than is typically required for PCs, and offers extended support for Windows XP Embedded for up to seven years. **Windows XP Embedded is a good choice for a dedicated device whose life cycle needs to be longer than that of a typical PC.**



Making the Business Decision



If two or more OS options meet the technical requirements of your project, then costs and business models become the deciding factors. The two main cost factors to consider are the fixed costs of the development project and the variable costs of the device per unit.

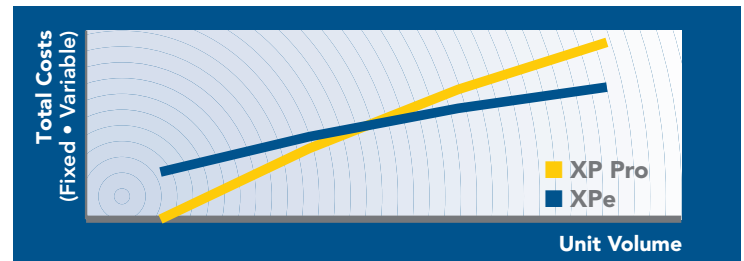
FIXED Costs per Project	VARIABLE Costs per Unit
(Months of Development) x (Developers) x (Cost/Developer)	(OS License Cost + Applications Licenses) x (Number of Devices)
Total Development Cost	Total Licensing Cost

Fixed costs consist primarily of the engineering time required to develop the device, whether you do it yourself or outsource the work to an experienced systems integrator like BSQUARE. The most important variable costs are the software runtime licenses.

The per unit licensing costs for Windows XP Embedded devices will be substantially lower than for Windows XP Professional devices. However, up front development costs for a Windows XP Professional machine will generally be lower because certain extra engineering tasks need to be performed to build a Windows XP Embedded device, such as selecting OS components, componentizing applications, and building and testing OS images.

	Windows XP Professional	Windows XP Embedded
Fixed Costs	Lower	Higher
Variable Costs	Higher	Lower

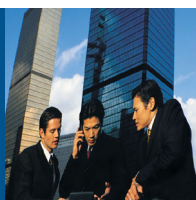
Because of this tradeoff between fixed and variable costs, there is an economy of scale at work in the choice between Windows XP Embedded and Windows XP Professional. The higher the unit volume, the more economical Windows XP Embedded will tend to be, while Windows XP Professional will tend to have the advantage for lower volume deployments.



Determining exactly where the break-even point will lie is difficult and depends very much on the details of your specific project.

Contact BSQUARE and talk to one of our licensing experts who can calculate your project's break-even point and help you select the best Windows operating system for your device design.

Windows XP Professional	Windows XP Embedded
<p>User Flexibility:</p> <ul style="list-style-type: none"> Define Usage Install applications Add peripherals Reconfigure system 	<p>Developer Flexibility:</p> <ul style="list-style-type: none"> Define Usage Choose Components Lock-down interface Manage Remotely



The Bottom Line on Windows XP Embedded Compared to Windows XP Professional

Windows XP Embedded is based on the same binaries as Windows XP Professional so you can leverage the knowledge and expertise of six million Visual Studio developers worldwide. Windows XP Embedded also has several significant differences, making it ideal for embedded devices:

- Componentized to include only the features you need
- Able to run without hard drive, monitor, or keyboard
- Capable of booting from read-only media or network
- Sold at a lower price through different channels such as BSQUARE

How to Get Started

There are several ways you can learn more about the benefits of licensing Windows Embedded software and development tools from BSQUARE:

Research	Analyze	Evaluate
<p>Explore the Microsoft Windows licenses section on our web site at www.bsquare.com/licenses.</p> <ul style="list-style-type: none">• Get in-depth information about individual Windows Embedded and Classic operating systems• Learn how to choose the right operating system for your specific embedded device• Explore data sheets, white papers, and FAQs in our technical resource center	<p>Have one of our experts analyze your Microsoft Windows licensing needs and provide you with the information and tools you need to make the right choices.</p> <ul style="list-style-type: none">• Call BSQUARE today at 888-820-4500 or 425-519-5900• Go to www.bsquare.com/licenses and click on the Rapid Support link	<p>A free Software Evaluation Kit provides an opportunity to experience first-hand the power and ease of developing with Windows Embedded.</p> <ul style="list-style-type: none">• Call BSQUARE today at 888-820-4500 or 425-519-5900• Go to www.bsquare.com/licenses and click on the Rapid Support link or complete an Evaluation Request form.

About BSQUARE

BSQUARE is a leading global provider of software, engineering services and consulting for the smart device market. Since 1994, BSQUARE has provided world-class device makers with the building blocks necessary to design, develop, and test innovative products quickly and cost effectively. A sample of BSQUARE customers includes Motorola, Hewlett-Packard, Texas Instruments, Vodafone U.K., HTC, Microsoft and others. BSQUARE is one of Microsoft's largest value-added partners worldwide for Windows Embedded software, a Gold-level Systems Integrator of the year, and a leading Windows Mobile solutions provider for Smartphone and PocketPC. The company's SDIO Now! technology has been adopted by over 50 top-tier smart device makers.