

# Revolution: Windows CE Begins Exciting New Evolution

By Bob Bakow

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Talk to nearly anyone in the manufacturing community about the Windows CE operating system and words such as innovative, groundbreaking, and revolutionary are often used.

“I haven’t seen this much excitement about a product since the introduction of PC-based control,” says Larry Keefe, marketing communications manager for InduSoft, Hilton Head, S.C. “It’s going to be an ongoing evolution.”

InduSoft and Think & Do Software, Ann Arbor, Mich., were among the first software vendors to ship industrial solutions that run on the Windows CE platform. Recently, the two software providers teamed up to offer InduSoft for Think & Do.

The software allows users to add sophisticated HMI (human/machine interface) and SCADA (supervisory control and data acquisition) capabilities to their Think & Do PC-based control application. The connectivity between the two packages is accomplished through an OLE (object linking and embedding) for process control (OPC).

In addition, InduSoft recently shipped version 2.2 of its CEView monitoring and control software for Windows CE. CEView is a complete supervisory-control, process monitoring, and operator-interface software for the operating system. It operates in diskless handhelds, palm-tops and mobile and embedded PCs, making it adaptable for OEM (original equipment manufacturers) and end-user applications.

“This is the start of a revolution,” adds Derek Spratt, president and CEO of Intrinsic Software, Vancouver, B.C. “The momentum for Windows CE has just kicked into high gear.”

“Windows CE will absolutely revolutionize the IT-enabled (information technology) manufacturing enterprise,” says Chuck Gillingham, vice president of marketing for ICONICS Inc., Foxborough, Mass., the developer of Pocket Genesis CE, a suite of OPC-compliant applications for factory automation. Pocket Genesis CE is the first suite of applications that includes industrial DCOM (distributed component-object model) capability for Windows CE.

“Windows CE introduces an enormously popular, well-understood development and runtime environment as a technically viable and commercially competitive alternative to traditional embedded solutions or black boxes,” Gillingham explains. “The next group I would expect to become more involved in Windows CE is the embedded control market.”

“The embedded market is a huge market for Windows CE because it has been very proprietary in the past,” adds Bob Bloom, marketing consultant for Exor, Wellington, Fla.

“There’s tremendous potential for Windows CE in manufacturing,” adds Bloom, who explains that the marketplace for Windows CE is in its infancy and will rapidly evolve, as did the market for Windows NT.

CEngine is Exor's first product for the Windows CE platform. Developed in conjunction with Microsoft Corp., Redmond, Wash.; Geneer, Des Plaines, Ill.; and Think & Do Software, the four companies recently formed CEngineAlliance, a cooperative effort to facilitate the migration of control systems for industrial devices and machinery to the Windows CE platform.

CEngine allows engineers to see how their designs will function, feel, look, and sound in realtime. CEngine is designed to maximize the functionality of Windows CE in embedded systems and is specifically intended for research and development departments in an array of OEM (original-equipment manufacturers) industries.

CEngine allows design engineers to implement Windows CE out-of-the-box in virtually any computing application, prototype, product design, proof-of-concept study, or complete embedded control system.

Windows CE is the latest addition to Microsoft's operating system (OS) family. The OS was developed from scratch and supports a subset of the Win32 application programming interface (API), which allows it to provide a look and feel similar to Windows 95/NT.

The realtime operating system is designed to bring the power and flexibility of PC software programs to applications with limited memory configuration such as embedded automation and control devices.

The next version of the operating system, Windows CE 3.0 is scheduled for release early next year and is expected to greatly enhance the system's applicability for industrial use including support for DCOM and improved realtime capabilities. (see related story, pg. 8)

The driving force behind the popularity of Windows CE is that, along with the Windows NT operating system, it serves as the common link in disparate manufacturing software application, allowing them to integrate and operate seamlessly.

The result is a more efficient exchange of information from the shop floor to ERP (enterprise resource planning) processes, reducing the operational and technical costs for a manufacturing enterprise.

"Speed is very important to manufacturers and Windows CE makes that practical," says Bloom.

The power of Windows CE lies in its ability to "dissolve disparate software applications and link the enterprise to the device level," notes Intrinsic's Spratt. "Our clients are excited about linking Windows CE to their corporate systems," says Spratt, who explains that the integration will lead to improved time-to-market and ROI (return on investment).

"Windows CE offers a standard, a common way to do things. It's solid and stable. There's a comfort and security factor for the end user," says Andy McMillan, marketing director for Think & Do Software, who recently added Windows CE runtime capability to its software package.

The early adopters of Windows CE such as the flat-panel display and mobile data-collection-device manufacturers have been working with the operating system for about one year. And it's these early adopters who will "pave the way for what will amount to a virtual flood of Windows CE-based products onto the factory floor," says Iconics' Gillingham.

“Built-in communication features such as secure Internet, wireless communication interfaces, and extendable device architecture, plus the inclusion of ‘hard’ realtime performance with Windows CE 3.0, makes the OS very suitable for open PLCs (programmable logic controllers), intelligent field devices and instrumentation, utility monitors, VFDs (variable-frequency drives), smart motor controllers, and RTUs (remote terminal units) as well as quality auditors, building maintenance, calibration technicians, and service fleet H/PCs (handheld personal computers),” Gillingham maintains.

In addition, the acceptance of Windows DNA (Distributed internet Application) architecture coupled with the installed base of Windows-based enterprise software applications leads to tremendous possibilities for Windows CE.

“Manufacturing plants can realize coordinated, seamless, and integrated information architecture that relates customer order, quality information, material availability, equipment, and personnel status,” says Gillingham.

There are several other reasons for Windows CE’s rising popularity. For instance, the similarity between Windows CE and Windows NT makes the operating system less intimidating for users. “It takes known components and assembles them in a different way,” says McMillan. “It’s a fast and easy conversion.”

“The development code is the same as people are accustomed to,” adds Don Richardson, Microsoft’s technical evangelist for manufacturing. In fact, development occurs on a Windows NT platform using Microsoft’s Visual C++ for Windows CE. All of the debugging capabilities are available as well as the H/PC desktop emulator.

Windows CE’s modular design is another important feature because it allows manufacturers to customize their operating systems for a wide variety of platforms. Because the software system is componentized, embedded system platforms can be designed using the minimum set of software modules and components needed to support the platform’s system requirements, which minimizes the memory footprint and maximizes performance.

“The approach was to create a foundation of software building blocks that could be assembled in many different ways to create new devices,” says Doug Dedo, Microsoft’s group product manager for the Windows CE enterprise team. “This meant that if you wanted to build a device, you could pick and choose only those pieces you needed and keep the size of your software consistent with the size of your device.”

“Windows CE will make it more practical to build manufacturing systems that are modular,” explains McMillan, who notes that modular systems are easy to upgrade and assemble because each section runs on a separate Windows CE operating system. “Speed is very important to manufacturers, and Windows CE makes that practical.”

Other features of the OS include portability, the ability to develop an application once and port it to other systems, and interoperability, which allows two-way communication between collection points on the factory floor and the MRP (materials requirements planning) and ERP (enterprise resource planning) servers used to run the enterprise.

“A major attraction of the OS is that users can easily move work they’ve already done. There’s a level of innovation an open platform provides you,” notes Richardson.

In addition, Windows CE, unlike Windows NT, features a diskless operation, instant on/off, small size, long battery life, synchronization, and low cost. Also, the operating system requires only a fraction of the memory of Windows 95 and Windows NT. The small memory and storage footprint makes Windows CE highly attractive to embedded developers.

“Windows CE takes advantage of the features of PC-based control without the constraints of Windows NT,” McMillan adds. “It extends the reach of PC-based control.”

“It reduces the cost of putting intelligence where you need it. Your operators can be mobile more easily. It can be used anywhere where you need small, robust intelligence,” notes InduSoft’s Keefe.

For example, as Microsoft’s Dedo explains, members of a quality-control team can draw picture of an equipment malfunction on the touchscreen of a Windows CE device.

In addition, a device running on the Windows CE platform offers more reliability than a PC, and important feature in data collection and transfer. “CE is a much more secure environment and more robust,” Gillingham explains.

While the entire manufacturing community will benefit immensely from Windows CE, it will be especially advantageous to small and midsized manufacturers, who see it as a tool to help them compete with their larger competitors. Windows CE obviates the need for proprietary solutions, meaning that smaller companies do not need to focus their programmers’ skills in that area.

In addition, Windows CE is an extremely affordable solution, which leads to reduced development time and cost. “Smaller manufacturers will be able to do a whole lot more a whole lot faster,” McMillan maintains.

“Windows CE will level the playing field,” adds Bill Thompson, senior analyst at ABC Advisory Group, Dedham, Mass.

“Small companies now have a tool to compete with large companies,” says InduSoft’s Keefe.

“Your resources can be limited, and you can get a lot done,” says Doug Hughes, a consultant for Microsoft’s manufacturing engineering practice.

The popularity of Windows CE should continue to grow as more software and hardware reaches the market. “The first wave of hardware and software for Windows CE is proving to be incredibly popular with customers,” says Bloom.

“Windows CE itself will be constantly improving for building intelligent digital devices, says Microsoft’s Dedo. “This includes enhancing the realtime performance of the OS, extending the choice of processors, innovating on user interfaces, expanding communication options, and broadening the number of international languages supported.”