



Microsoft Windows CE .NET Customer Solution Case Study



Overview

Country or Region: France

Industry: Manufacturing

Customer Profile

Chaveriat Robotique offers programmable robotic arms for manufacturing operations globally.

Business Situation

The company had been using the same robotic arm programming interface since the mid-1980s, and was falling behind competitors who had moved to more modern and ergonomic user interfaces.

Solution

Using Microsoft® Windows® CE .NET 4.2, Chaveriat Robotique has designed Synaps, an innovative interface based on familiar Windows technology. As a result, it has reasserted itself as a force in the world of robotic arms.

Benefits

- Robots are 10 percent less expensive to build with 30 percent more functionality
- Higher ROI for customers
- Easier diagnosis of errors
- Clear development path
- Improved market share

Robot Manufacturer Wins Market Share Thanks to New Programming Interface

“Using a constantly evolving software platform means that we are able to consistently offer our customers the most up-to-date user interfaces. As a result, they can improve their working processes.”

Robert Bonin, Research & Development Manager, Chaveriat Robotique

The robotic arm industry is relatively small but highly competitive. Chaveriat Robotique had been steadily producing robots for over twenty years. However, with the same line-command interface in use since the mid-eighties, it was increasingly losing market share to competitors that had adopted modern graphical user interfaces. As a result, Chaveriat Robotique began looking for an innovative replacement. The company selected Microsoft® Windows® CE .NET 4.2 to develop handheld devices that control the robots' motion in real time. Thanks to Windows CE .NET, Chaveriat Robotique has been able to offer a new generation of input devices that reduce production costs by 10 percent and offer 30 percent more functionality than previous input devices. Since the new interfaces became available at the beginning of 2004, the company has significantly increased its market share.



“Chaveriat Robotique chose Windows CE .NET because it offered real-time processing and a GUI at the right price.”

Thierry Joubert, Chief Technology Officer, Theoris

Situation

Chaveriat Robotique, a French company, has produced components for the automation of industrial activities for over 50 years. Nearly 20 years ago, Chaveriat Robotique began developing robotic arms for use in the molded plastics industry.

Today, the company has more than 6,000 square meters of production space, with 28 employees and annual revenue of €4.5 million (US\$5.5 million). The company operates in a very small but highly-competitive market, producing up to 100 robotic arms per year.

When plastic products such as car dashboards emerge from the molding process, they are too fragile to be turned out onto the factory floor. They are also too hot to be removed by hand, but they must be moved to prevent slowing down the factory productivity. The programmed robotic arm removes items from the molds and places them in the cooling section.

The input console for programming Chaveriat Robotique robots needed to be redesigned for two reasons. First, it was created in Microware OS-9, a real-time operating system that had been on the market for many years and was badly outdated.

Second, in terms of the hardware, the console was built around a very small, four-line liquid crystal display, which had no colors and was difficult to read and program. Operators in the plastic molding industry are not typically trained to use a command-line interface computer, so they would benefit from an intuitive graphical interface.

Robert Bonin, Research & Development Manager at Chaveriat Robotique, points out: “Because of the console’s operating system, the robotic arms that we produced were not as technologically advanced as those of our

competitors. The operating system was obsolete—it did not support graphical development or offer enough functionality. Overall, both the hardware and software were out of date.”

“We needed a system that would enable our customers to change the robot’s programs and an interface that would let the factory floor staff change the program quickly, as demands changed,” continues Bonin.

With the aging operating system and an unfriendly user interface, Chaveriat Robotique management found it increasingly difficult to sell its robots to the market. The company needed a new solution to help it improve its ability to compete.

Solution

After an extensive audit of the available options, Chaveriat Robotique chose the Microsoft® Windows® CE .NET operating system version 4.2. This real-time operating system (RTOS) provides a robust solution that is easily programmable and comes with a clear and easy-to-use graphical user interface.

Windows CE .NET is a 32-bit operating system with a small footprint. It integrates real-time capabilities with advanced Windows technologies and enables embedded developers to build innovative, small-footprint devices. It is designed for specific uses, typically in small devices with limited memory or processing resources. The robotic input console was perfectly suited to its purpose.

Thierry Joubert, Chief Technology Officer at Theoris, Chaveriat Robotique’s partner on the project, explains, “Chaveriat Robotique chose Windows CE .NET because it offered real-time processing and a graphical user interface at the right price. We were confident that the Windows operating system was familiar enough for users to adapt to the input

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Robert Bonin, Research & Development Manager, Chaveriat Robotique

consoles quickly. Other operating systems on the market had elements of each of these factors, but the Windows solution was the only one that combined them all.”

“We were looking for a real-time operating system that offered all the functionality of a PC with a graphical user interface,” observes Bonin. “We also needed a system that connected to standard PC interface technologies such as USB and Ethernet.”

System development began in early 2003, and the first of the new robots run by Synaps—Chaveriat Robotique's new Windows CE .NET-based input system—was installed in February 2004. “We concentrated on creating a prototype that modeled exactly what Chaveriat Robotique customers needed,” says Joubert. “The flexibility of Windows CE .NET really helped us in this project, because it enabled us to respond to the very specific needs of the industrial robotic sector.”

For example, robotic arms tend to have their programs written on a PC and then downloaded to the input device. Chaveriat Robotique, however, saw that there was value in having an input device that was flexible enough to have programs written directly to it.

“Buying a PC for programming adds extra expense to the process. Every penny is important, so an input device that bypasses the need for a PC shaves a bit more off the end-customer price,” says Joubert. “And given the speed with which production lines need to be able to switch to meet just-in-time production targets, it is important that the robots can be programmed on the factory floor.”

Benefits

Higher Return on Investment for Customers

Bonin estimates that robots powered by Synaps are 10 percent cheaper to produce than predecessors, yet they deliver 30 percent more functionality. Some of the cost savings is passed along to customers, which makes the system even more competitive in the global market.

Customers also benefit from being able to use the intuitive graphical user interface to program new functions, enabling faster allocation of robots to new tasks.

“With the help of Windows CE .NET, we have delivered an entirely new price-competitive system to the marketplace,” says Bonin. “Because it is so much easier to make changes to the robot’s programs, companies that choose Synaps benefit from the significantly reduced time it takes to change its functions.”

“This also introduces significant flexibility to the process and lets them use the robots in ways that they could not previously. Taken together, this means that companies enjoy a very rapid return on investment on robots powered by Synaps,” he notes.

Boosting End-User Productivity

For assembly line operators, the main benefits of Synaps robotic arms are the friendly user interface and flexibility in programming operations, which help increase worker productivity.

“This has been a significant selling point for customers when we talk to them about Synaps,” advises Bonin. “Because the new interfaces are so ergonomic and the technicians are dealing with the familiar Windows environment, they are able to progress rapidly to the system’s more complex functionality. It takes the same

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amount of time to train them as before, but they are learning nearly a third more capabilities.”

Clear Development Path

Using Windows CE .NET ensures that Chaveriat Robotique offers its customers a product that moves forward as technology evolves. For example, Synaps can be upgraded to Windows CE 5.0 someday, without any changes to hardware. This, in turn, enables customers to benefit from their robotics investment longer. The flexibility of the Windows operating system gives the company the ability to continue to take advantage of developments in the market and constantly improve its offering.

“Using a platform that is constantly evolving means that we are able to consistently offer our customers the most up-to-date user interfaces. As a result they can improve their working processes,” says Bonin. “This enhances our reputation in the market and ensures that our customers have a positive experience when they are dealing with us.”

Improved Hardware and Software Performance

Since moving to the Windows CE .NET environment, Chaveriat Robotique has enjoyed fewer software and hardware failures compared with the previous version. This is the result of being able to take advantage of up-to-date hardware, which was not possible in the previous environment.

“Stability has improved significantly as a result of moving to Windows CE .NET because we can use modern hardware with the software, rather than relying on reconditioned

units or patches to build our products,” states Bonin. “We have also become more competitive because we have a number of alternative suppliers. We can now search out the cheapest price and pass that savings on to our customers.”

“Since the majority of downtime is related to operator errors in robot programming, the new Windows CE .NET system is far better in this regard because it provides a faster diagnostic and reduces restart time after a problem. All in all, this translates into reduced support costs for Chaveriat”

Maintaining Market Share

With Synaps, Chaveriat Robotique now stands out in a very specialized market, which is helping the company gain market share.

“It is fair to say that Windows CE .NET and Synaps have already helped Chaveriat Robotique consolidate and gain market share over the last year,” says Bonin. “We are currently selling about 100 robots a year. That number would have been far smaller if we had not introduced the Synaps programming interface.”

“Synaps has been the company’s biggest bet: If the project had not been delivered on time or satisfied customers, Chaveriat Robotique would not be producing robotic arms today,” says Bonin. “All of our competitors made the switch to modern technical interfaces about five years ago, but their systems are far less innovative and more expensive than Synaps.”

Software and Services

- Technologies
 - Microsoft Windows CE .NET version 4.2

Hardware

- Custom PC-104 board based on an Intel® Pentium® 166 MHz processor