

**Analysis of
breaking
news
that impacts
you.**

MDSI Leads An Industrial Revolution In Computer Numerical Controls

The emerging market for PC-based software Computer Numerical Controls (CNC) utilizing real-time operating systems such as RMX and QNX is experiencing triple digit growth as suppliers adopt Windows NT today. Windows NT real-time extensions along with the continuing increase in processing power of the PC have made it viable for a new breed of CNC suppliers to employ commercial software and hardware technologies in CNC systems. Emerging software-based CNC suppliers in the

worldwide market offering Windows NT solutions include: Advanced Technology Research, Beckhoff Systems, Giddings & Lewis, MDSI, and Power Automation. Each supplier relies on a total software solution where the CNC is hosted on Windows NT operating system and is independent of motion coprocessor boards in the PC backplane. Windows NT's graphical user interface and networking capabilities are leveraged by these suppliers to provide Operator Interface, Programmable Logic Controller, and Numerical Control functions as integrated software. PC-based software CNCs are a viable alternative

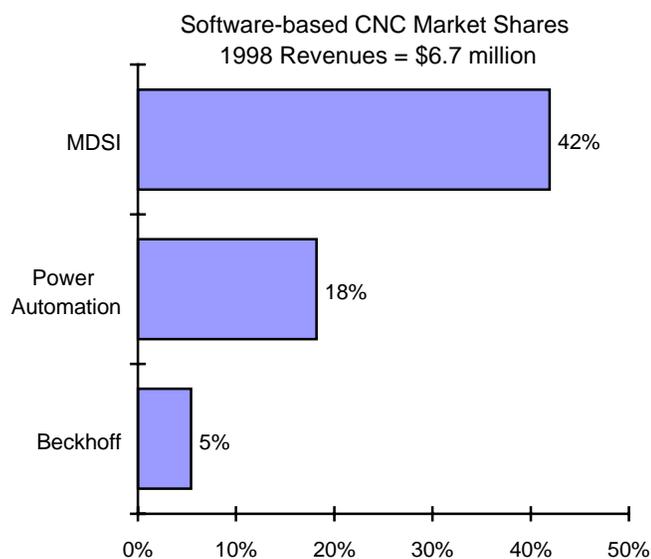
Company	Product
Advanced Technology Research	RCS Enterprise
Beckhoff Systems	TwinCAT NC
Cleveland Motion Control	BurnyNT
MDSI	OpenCNC
Power Automation	PA 8000 NT
Giddings & Lewis	MachineMate

PC-based software CNCs have converged on Windows NT

and represent a competitive threat to proprietary solutions in many application segments. Software-based CNC suppliers enable complete system solutions to be assembled, because they adhere to open standards in software interfaces as well as field device & servo drive networks.

Emerging Market

In 1998, software-based CNCs hosted on Windows NT, QNX, and RMX platforms accounted nearly \$7 million in revenues. Overall, the software-based CNC market is considered to be in its infancy with just a handful of suppliers today proselytizing to a user community familiar with closed proprietary systems. MDSI's efforts to lead the next industrial revolution on the factory floor has enabled them to capture an early market share lead in the software-based CNC market, despite a later introduction of an NT solution. MDSI's late adoption of Windows NT underscores a cautionary approach to adopt stable technologies, specifically when relying on third party software vendors providing NT real-time extensions. Several CNC suppliers unveiled preemptive NT based software CNCs at the 1997 European Machine Tool Show banking on the



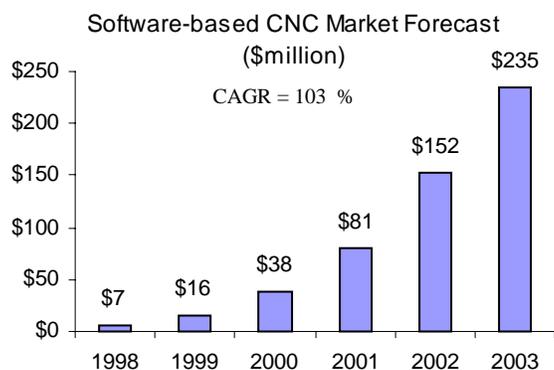
combination of long sales cycles and the likelihood of VenturCom's solution for NT real-time extensions gaining acceptance. Consequently, the start of NT product shipments in this market have not been significant until the second half of 1998.

Automation is being revolutionized with the shift from proprietary hardware controls to open architecture software based solutions. The combined efforts of these suppliers reflect the shift toward Microsoft-based solutions in industrial controls today. Convergence of Windows NT in business systems and automation provides an opportunity for organizations to obtain considerable cost savings by unifying training and support throughout the enterprise.

Traditional CNC suppliers like Giddings & Lewis and Cleveland Motion Control that offer PC-based software CNCs are adding credibility to the concept of software solutions. Introductions of software-based CNCs are being employed as a breakaway strategy to spur new attention to their companies as cutting edge technology providers.

A Bright Future Lies Ahead

ARC forecasts the software-based CNC market growth at over 103 percent annually through 2003. By moving to NT-based platforms, software CNCs are unifying the operator interfaces for both business and plant floor systems. Increasing use of



Computer Aided Design (CAD) tools proliferating in both small machine tools shops and high production facilities provides the opportunity to use identical design tools in the office and plant floor. Windows NT based CAD systems are widely available and are surpassing the number of shipments of UNIX systems today. Operator interface requirements of CNC are quite specialized, so an integrated operator interface and CNC controller running in the same box are attractive to users trying to consolidate their control architectures. System integrators and machine

tool builders who recognize the opportunity to combine multi-vendor software solutions on commercial hardware platforms will be the catalyst for growth in the future.