A 25-Year Odyssey to Connect the Enterprise

Despite light-years of progress, plants remain challenged to integrate control with information systems.

by Paul Studebaker

When *Control*'s inaugural issue was published in October, 1988, our first mention of enterprise resource planning's (ERP) ancestor, computer-integrated manufacturing (CIM), was still half a year away. Over the following 25 years, we chronicled the trials and tribulations of bringing the incredible advances in information technology to the complex, cautious and insular world of industrial process control. In commemoration of our 25th anniversary, here's the first in a monthly series describing progress in each of 12 technologies, as written in the first 300 issues of *Control* magazine.

The Way It Was in 1989

"Today's leading-edge industrial facilities must produce high-quality products at co.mpetitive prices — and do so in an environment that permits unparalleled flexibility," said David W. Brown, then senior departmental manager,

[TIMELINE]

OCTOBER 1988
Control Is Launched at ISA/88 in Houston
The inaugural issue's 284 pages include not a word about enterprise connectivity.

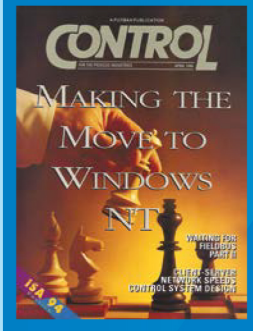
APRIL 1989
CIM Acronym Shows Up in the Process Industries

OCTOBER 1989
CIM Market to See 13% CAGR
Dataquest studies 1988 worldwide and North American revenue and market share for the top 20 vendors of CIM products and systems and predicts a five year compound growth rate of 13%.

JULY 1990
Microsoft Introduces Windows 3.0

JUNE 1992
CIM Hardware Market to Reach $1.6 Billion by 1997
Market Intelligence Research Corp. forecasts 15% growth in the market for CIM hardware, attributable to unit shipment gains, not price increases. Market is predicted to reach $1.6 billion by 1997.

OCTOBER 1992
MESA Formed
Nine vendors of manufacturing execution system (MES) software form the Manufacturing Execution Systems Assn. (MESA) to educate users in the technology. Charter members are Anderson Consulting, Camstar Systems, Cimcorp, Cimflex Teknowledge, Consilium, Effective Management Systems, Industrial Computer Corp., Intellution and Promis.



APRIL 1994
Making the Move to Windows NT
"Having come from the VMS world and the DOS/Windows world, NT is kind of the best of both," said Don Golden, then a consultant at DMC. Meanwhile, John Brown engineers replace 12 mainframes with one—plus 150 UNIX servers, 500 workstations, and more than 4,000 PCs—to connect engineers around the world.

OCTOBER 1995
STEP Data Exchange Standard a 'Breakthrough'
The international Standards for Exchange of Product model data (STEP) offer common terms, concepts and software objects for two- and three-dimensional general, process and control-related engineering designs.

NOVEMBER 1995
Wonderware Launches InTrack MES

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DECEMBER1995
Vendors Team Up to Form OPC Task Force
OLE for process control (OPC) will streamline integration of disparate applications by defining a set of standard interfaces, properties and methods to extend object linking and embedding (OLE) and Microsoft's component object model (COM) technologies.

JANUARY1997
SP95 Committee Formed to Define ERP/Control Interface
During its first meeting at the ISA Show in October, 1996, the committee outlined a plan and aggressive schedule to define the interface between control and other enterprise systems such as manufacturing/enterprise resource planning (MRP/ERP) and manufacturing execution systems (MES).

APRIL1998
All for One
As the common theme of *Control's* Top 10 Trends, widespread adoption of commercial technologies, including personal computers, Windows NT and Ethernet, is bringing together process control and the enterprise.

NOVEMBER1998
Global Information Market Pegged at $1.8 Trillion
"Surge expected in Internet use."

APRIL1999
'The ERP Opportunity' Arrives
"One of the trends that has kind of snuck up on us is the gradual disappearance of the barriers that limit the data at the plant control system level from being used on a real-time basis at the ERP level," said Joe Feeley, then a *Control* senior technical editor.

MARCH2000
On Y2K Hysteria
"Various economic authorities have estimated that all of us collectively spent about half a trillion dollars on the Y2K foolishness," said columnist Terrence McMahon. "Not even Jay Leno can make that sound funny."

SEPTEMBER2000
Microsoft announces .Net for Manufacturing to "fill gaps between apps across the extended enterprise."

2002
Is It Ironic?
In *Control's* transition from paper to digital archives, the entire year of 2002 has been misplaced.

MARCH1996
OPC Draft Is Completed

SEPTEMBER1996
ISA Sets Up Survey Committee to Research Enterprise/Control Integration

NOVEMBER1996
OPC Foundation Chartered

AUGUST1997
Interoperability Becomes Reality in 'Stealth' Demo
Microsoft, Fisher-Rosemount, Intergraph and Marcam give "stealth" working demonstration of "seamless, integrated multi-vendor information exchange" in Atlanta, Georgia.

JULY1998
Cisco and Echelon to Link Factory and Internet
By integrating control networks with IP-based data networks, industry will be able to migrate away from expensive leased phone lines and increase visibility into critical process control systems.

SEPTEMBER1998
Year 2000 Survival Guide
With just 15 months remaining before the anticipated Y2K Armageddon, *Control's* survival guide offers "industrial-strength advice on how to keep your plant running smoothly into the next millennium."

MARCH1999
Moore's Law Meets Gates' Law
"Moore's law says that processor speed will double every 18 months but Gate's law says Microsoft's software will grow to absorb that and all the available memory," said Rich Merritt, then a *Control* technical editor.

SEPTEMBER1999
OPC Fills Gaps between Apps
A supplement to *Control* tells how OLE for process control joins diverse devices and applications to form a new generation of integrated plants.

MARCH2001
The I Team
Talking about who to call to integrate the plant floor with the enterprise, *Control* describes the pros, cons and how-to's of using in-house resources, vendors or system integrators to help implement an ERP project.

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Lockwood Greene Engineers in April, 1989. As a result, many businesses have undertaken major revisions their management and operational philosophies. Some of the more progressive in the process industries have adopted CIM strategies and have implemented numerous CIM technologies.

CIM —the orderly integration of computer-based operations throughout a facility—is a major task.

Computer technology has seen dramatic advances in the past 10 years, including the development of plant host computers at financially viable costs and networked personal computers that are integral elements of a CIM architecture. Software has evolved from proprietary, highly customized applications to those which allow a systems integrator to program PLCs and configure DCS systems on a standard PC.

The latest technology to affect process control is networking. Even though CIM projects are customized, there are still standard elements, e.g., PLCs, distributed control systems, host computers, graphic consoles, PC workstations, and management information systems (MIS). Within the past few years, it has become possible to send fast, high-quality data throughout this chain of microprocessor-based devices.

"Legacy computer systems offer the greatest resistance to systems integration," said Sam Bansal, then a contributing editor, in "Integrating Process Control with MRP II" (August, 1990). "Differences and redundancies in data definitions and untimely generation and storage of data can make it difficult to effectively communicate data from different systems to each other and to the user."

The accompanying timeline shows how the rise of PC-based and Internet technology, improvements in speed and networking, and standardization of interfaces allowed quantum leaps in enterprise connectivity. That led to increasing interconnection and interaction between control and IT systems, and the virtual—and often painful—melding of the regimes' professional minds.

25 Years Later

Perhaps a sign that we're ready to take enterprise connectivity as granted, at least as it applies to process control, *Control*'s coverage of the topic thins out in the first few years of this decade. In January 2012, Dan Hebert, senior technical editor, simply said, "Implementing this level of connectivity can be very complex, but standards such as OPC, ISA-95 and Business to Manufacturing Mark-up Language (B2MML) can ease challenges. Using these and other standards can provide a vendor-independent format for data exchange, enabling seamless connections among systems from different suppliers."

But it's still not simple. In November 2013, we sum up the situation: "The gap between business-level IT computing and its counterparts on the plant floor is narrowing in many places, but there remain yawning canyons in others," says Jim Montague, executive editor. "Despite the challenges, the Industrial Internet is bringing the benefits of commercial connectivity and collaboration platforms to the realm of manufacturing."

Paul Studebaker is Control's editor in chief.

JANUARY2003

In "Is OPC Ready for Prime Time?" end users appreciate the elimination of custom drivers, but many question the purported "ease" of establishing reliable OPC connections among products from different vendors.

MARCH2003

Jump Start IT

"It is easier to teach an instrument and control engineer about computer networks than the other way around," said Ian Verhappen, then director, ICE-Pros, Fort McMurray, Alberta.

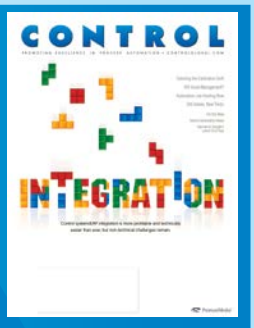
OCTOBER2007

Will OPC-UA Measure Up to the Hype?

We wonder if the new OPC Unified Architecture (UA) standard will meet expectations and so do many others, as was evident from the recently held and sold out OPC-UA conference.

MARCH2009

Some Success, but Still Spaghetti



Users are seeing some success, said Jim Kline, global business and product manager for ABB's Collaborative Production Management division. "However, they want more integrated and seamless access to data without replicating it all in huge computers or numerous PCs that will all need maintenance. They want to get rid of all the usual spaghetti between their organizational layers."

JULY2012

MESA, WBF Merging to Expand Operations, B2MML Focus

The Manufacturing Enterprise Solutions Association International and WBF, the Organization for Production Technology, announced May 22 that they had agreed to merge.

NOVEMBER2013

In our 300th issue, we sum up the enterprise connectivity situation: "The gap between business-level IT computing and its counterparts on the plant floor is narrowing in many places, but there remain yawning canyons in others," says Jim Montague, executive editor.

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