Objectivity

PROCESS CONTROL MARKET BRIEF

The push for maximum productivity and quality at the lowest cost is a huge challenge for today's process control market. Business models driving production efficiencies and productivity improvements coupled with better information sharing are key elements for a competitive edge. With the advent of smart sensors, faster processors and the increased need to preserve more information for regulatory compliance a lot more data is being generated and management is demanding more useful information from it. In many cases, information that once had a very limited audience now has to be analyzed and quickly shared with other organizations.

Analogous to a domino effect, changes made to a single operation can affect everything connected to it in a process control environment. When this environment contains multiple control platforms, the domino effect often triggers cascades of highly complex data that is difficult to store and manage. There comes a point in every system when it is no longer viable to keep adding more or faster hardware. New process control integration solutions are required.

System integration is critical as it enables a common process control goal: the sharing of information for real-time decision making. Consider the simplest models of systems integration - horizontal and vertical. Generally, horizontal integration involves tying highly complex enterprise systems together through data fusion technologies to share information for decision support. Vertical integration often refers to the “stacked” flow of information within an enterprise for efficient information management, enabling more cost-effective and timely delivery of products or services. The main goal of these integration strategies is to increase productivity and process efficiency. They also aid research into highly complex interrelationships, helping to find the elusive needles in very large and disparate haystacks of data. This reduces conflicting decisions while gathering and providing information in real time.

The heart of the integration problem is frequently encountered when companies try to achieve operational initiatives with disparate computing systems and applications. Increasingly, companies are realizing that the cost of maintaining this silo approach is steep, especially in terms of lost opportunities.

Objectivity AND PROCESS CONTROL

Since its founding in 1988, Objectivity, Inc. has become a global technology leader in data management products and services for software applications addressing the most demanding data management challenges. Objectivity/DB is the database management platform of choice for the world’s most innovative process control environments. Objectivity/DB is recognized for its ability to store and manage very large volumes of complex data for real-time event and relationship processing within mission-critical applications.

Within the process control market Objectivity/DB is being used for knowledge generation in addition to discovery and sharing. The Objectivity/DB platform is deployed in three broad types of process control applications:

- Complex design, modeling and simulation environments
- Highly automated applications that monitor equipment or situations, perform automated analysis and alert other equipment or responders
- Environments that help a wide variety of users explore vast repositories of data to discover meaningful relationships within them

Objectivity

Objectivity/DB FEATURES FOR THE MARKET

Process control industry leaders rely on the Objectivity/DB data management repository to ingest, store and manage high volumes of complex data so their control systems can provide the highest level of precision.

Objectivity/DB is a distributed, scalable, real-time data management platform for mission-critical system integration challenges. Objectivity/DB is ideal for both horizontal and vertical integration projects serving as the data fusion engine to tie together numerous dissimilar systems. The Objectivity/DB data management platform:

- Enables applications to analyze and correlate streaming event data from multiple disparate sources and manage its complicated interrelationships with known attributes
- Provides a clear real-time picture of known events, anomalies, and outcomes
- Analyzes in real time the complicated interrelationships between data
- Provides real-time access to the complicated interrelationships found between data that is housed in disparate databases within a single logical view
- Presents users with a very flexible view of their system enabling them to easily develop control strategies resulting in the highest levels of precision

The Objectivity/DB platform, which stores and manages complex information as objects, enables high performance process control applications to be built with virtually unlimited scalability, reliability, availability and flexibility.

Performance

Objectivity/DB is a highly reliable data management repository that can support extremely demanding, high precision process control applications involving complex, highly interrelated data. Objectivity's object-oriented database platform employs new techniques to deal with modern architectures and language paradigms. Depending on the complexity of the data being handled, Objectivity/DB can outperform traditional relational databases (RDBMS) by 10 to 1,000 times. The Objectivity/DB platform has demonstrated an ingest rate exceeding 1 Terabyte per hour in a 32-processor configuration.

Scalability

The ability to scale while managing complex data relationships enables Objectivity/DB to solve problems that are difficult and expensive to resolve using traditional database technology. Objectivity/DB enabled the Department of Energy to build the world's largest database, exceeding 1000 Terabytes. Objectivity/DB is the first commercially available database to scale to the Exabyte level.

Flexibility

Objectivity/DB runs on a wide variety of platforms including Linux, UNIX, Windows, and LynxOS, and supports C++, C#/.NET, ava, Python, Smalltalk, SQL/ODBC, and XML environments. Objectivity provides a wide range of productivity tools, training and consulting to speed process control application development. Objectivity/DB federated databases can be in a single platform or distributed seamlessly across a network. This architecture supports a wide range of application designs, including client/server and mixed-tier. The elements of this heterogeneous environment interoperate so that all users have a single logical view of the distributed data. Because of its 1.5MB footprint, Objectivity/DB can be deployed from a control center all the way down to individual control components.

Reliability

Objectivity/DB ensures the availability of data and business-critical applications despite network or system failures. Objectivity/DB's distributed architecture means data, distributed across any number of file server hosts, can be transparently replicated at different sites for fault tolerance or to improve performance locally. For continuous (99.999%) availability, Objectivity/DB has a High Availability option. This option ensures data availability in the event of system failure and provides sophisticated data replication across geographically dispersed servers. It also replicates system data and resources to ensure that there are no single points of failure.

Objectivity/DB IN PROCESS CONTROL ENVIRONMENTS

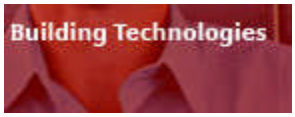
Fisher-Rosemount, part of Emerson Process Management, provides hardware, software and services for industrial process automation and information management. Over ten years ago Fisher-Rosemont partnered with Objectivity to build and deploy a whole new generation of process control equipment for networked manufacturing environments.

The result of this effort was the DeltaV system, which has become a market leader as the first fully digital automation system deployed at thousands of sites around the world. DeltaV provides a significant competitive advantage through reduced process variability. This is accomplished by keeping devices and instruments performing at their best, thereby notably lowering costs while improving quality and increasing throughput.

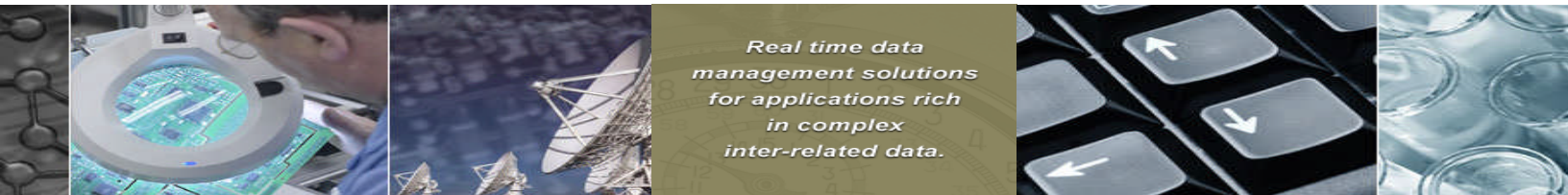
DeltaV has been commissioned in automation applications across the globe in projects ranging from 8 I/O up to 30,000 I/O configurations. Process control industries like the following have increased the return on their automation investment with the DeltaV system based on the Objectivity/DB repository: life sciences and biotechnical; oil, gas, and hydrocarbons; chemicals and specialty chemicals; pulp and paper; food and beverage; and metals, mining, and minerals.

Reliability is of paramount importance to DeltaV. Fisher Rosemount worked closely with Objectivity in the development of the initial high availability capabilities of the Objectivity/DB platform. Typically each configuration database stores about 100 megabytes of equipment and connectivity data, with the production database storing several gigabytes of data. DeltaV includes a data archiving and retrieval system that allows manufacturing and other process control environments to track their systems and products over long periods of time. From a suite of digital busses, to embedded advanced control, to easy enterprise integration and optimization, the Objectivity/DB-based DeltaV system delivers precision control and predictive maintenance for the process control industry.

Siemens AG is one of the world's largest electrical engineering and electronics companies.



As a leading provider of building controls, fire safety and security system solutions, Siemens Building Systems Group makes buildings comfortable, safe, productive and less costly to operate. The company focuses on improving the performance of its customers' buildings, so that its customers can focus on improving their business performance.



Objectivity/DB is the central repository for the Siemens APOGEE system, storing and managing all of the data that is acquired within the automation processes generated by this highly complex building management system. By correlating actual data against pre-determined benchmarks, users of these systems can "balance" and proactively manage facilities, such as San Francisco's Transamerica Tower or Chicago's O'Hare Airport, through automation.

The APOGEE application provides system-wide control and information about building operations - what is going on now as well as the historical trends of events over time. A key capability is that this information is accessible anywhere, any time, and any place through intuitive GUIs to authorized users. The APOGEE users can monitor areas to run according to parameters they set, send alarms if conditions require immediate attention, and send reports about conditions over time. APOGEE is certified for pharmaceutical laboratory and clean room environments which require very precise monitoring and the ability to isolate "data" or events in the case of catastrophes.

Adaptability, customer investment protection, and openness are the driving forces for this Siemens Building Systems Group process control technology. With controller flexibility, robust management tools and extensive compatibility, the Objectivity/DB data management platform provides a scalable, robust, stable foundation to manage building operations. Siemens selected Objectivity/DB because of its capacity for efficient storage and processing of complex object structures. This Objectivity/DB-based control environment assures they can continually adapt to new situations and technology, achieving the control Siemens customers need to keep their cost-to-performance ratio low.

Power Generation

The Siemens Power Generation Group is one of the premier companies in the international power generation sector. They are a world leader in the planning, construction and upgrading of components and systems for industrial plants - in particular, for the oil and gas industry and for wind energy systems.

As one of the world's leading specialists for industrial compressors, Siemens combines major advantages such as high-efficiency, reliability and compact design enabling shorter delivery periods and lower investment costs. Objectivity/DB is providing a robust database functionality and performance capability that allows Siemens to design and deliver industrial compressors to the market.

As result of a comprehensive in-house R&D program, the Compressor Engineering System (CES) was developed. CES allows compressor performance and rotor dynamics to be matched for custom specified applications. Objectivity/DB is the storage and management knowledge-base repository for the CES compressor design system. CES is used by Siemens engineers to build a proposal based on the customer's inquiry. This process includes the complete technical selection as well as the design calculation for each customer's highly complex industrial compressor. This Objectivity/DB-based design environment helps compressor engineers explore large repositories of data to discover meaningful relationships within the design parameters.

The Objectivity/DB-based CES design application ensures that Siemens delivers a well-proven, fully parametric, aerodynamic design to their clients' demanding compressor requirements. Objectivity's C++ interface is used for the compressor design system and in the interface that defines their manufacturing methods. Siemens CES compressors are used in multiple fields including: onshore/offshore oil and gas, natural gas distribution and storage, petrochemicals, refineries, methanol, fertilizers, olefins, and general chemicals operations.

NEC Empowered by Innovation

NEC is one of the world's leading providers of Internet, broadband network and enterprise business solutions. Dedicated to meeting the specialized needs of its diverse and global base of customers, NEC delivers tailored solutions in the key fields of computer, networking and electron devices, by integrating its technical strengths in the IT and network industries, and by providing advanced semiconductor solutions through NEC Electronics Corporation.

Within their semiconductor wafer fabrication manufacturing plants, NEC utilizes the industry's most advanced computer integrated manufacturing (CIM) system built exclusively with pure object technologies. NEC's Object-Oriented and Open (O3) manufacturing control system is based on the Objectivity/DB platform. O3 is at the heart of NEC's wafer fabrication control system. The O3 system is the result of NEC's migration from a centralized mainframe to an open systems environment. NEC started the O3 project in 1994 and has adopted object-oriented technology entirely for analysis, design, and implementation in C++, in addition to Objectivity's distributed object-oriented database.

NEC selected the Objectivity/DB platform because of its ability to represent and maintain complex relationships and maintain consistently high performance under high intensity read and update transactions. Objectivity/DB's reliability and dependability enables the O3 System to operate on a 7x24 basis enabling NEC to increase manufacturing capacity to meet growing market demand. Objectivity/DB enabled the O3 system to increase productivity and accelerate time-to-market, giving NEC a significant competitive advantage and increased market share.

metso automation

Metso Automation is part of the Metso Corporation, a leading manufacturer of paper and minerals processing technologies and services. Metso Automation specializes in automation and information management application networks and systems, field control technology and life cycle performance services for the pulp and paper, energy and oil and gas industries. The company's automation and information management offerings help stabilize, manage and improve these industry's process and products.

Developed by Metso Automation as the new era of process automation, metsoDNA (Dynamic Network of Applications) is based on the free networking of knowledge and information, control automation and embedded field control applications. The metsoDNA application, based on the Objectivity/DB platform, combines the results of information analysis and users' experience to create an organizational memory and shared experience. In the metsoDNA knowledge network, knowledge works together with the history and real-time process data to support decision-making, for instance, in disturbance management. metsoDNA increases a plant's engineering and maintenance productivity by ensuring quality design, efficient changes, and provides a high degree of reliability to the automation and information networks through their complete lifecycle.

The Objectivity/DB-based metsoDNA is a network where diverse applications based on different hardware and software solutions cooperate together, allowing a plant to flexibly select automation and information applications in response to its prevailing needs. This Objectivity/DB-based system provides Metso Automation customers with the ability to visualize an entire plant as a hierarchical map. This ability enables them to explore libraries of data to discover meaningful relationships enhancing the decision making process for improved production management and process understanding.