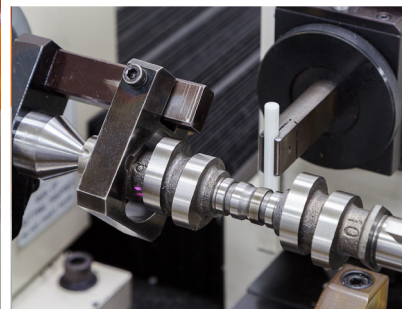


Why IQMS Wins as the Enterprise Software Solution for Manufacturing



IQMS
Manufacturing ERP

An Introduction

Next year will mark 30 years since IQMS was founded. In that time, the company has learned a thing or two about serving the manufacturing sector. “Even though ERP is the core system for manufacturing, every manufacturing executive I know says that the business is made or broken on the shop floor,” begins Ed Potoczak, industry manager at IQMS. If production is working well—if it is well planned, given appropriate resources, and monitored to make sure that it is being executed properly—then a manufacturer is likely to be making money, presuming that it has priced its products appropriately. “Consequently, everything centers on manufacturing operations, even though it’s sometimes treated like a little brother getting hand-me-downs when it comes to IT and applications,” explains Potoczak.

IQMS should know. The company, whose core business is enterprise resource planning (ERP) and manufacturing execution systems (MES) for discrete and process manufacturers, has grown to a customer base of more than 1,000 companies in North America, Europe, Asia, and Central America. With headquarters in Paso Robles, California, IQMS has support and implementation offices in Chicago, Charlotte, Toronto, Mexico City, London, and Shenzhen. For the past five years, IQMS has had a compound annual growth rate of 20 percent.

This white paper delineates some of the principal reasons IQMS is unique as a software provider to the manufacturing sector, detailing a dozen key differentiators that help explain the company’s strong growth and growing status. Before detailing those differentiating characteristics, it is useful to go back to the company’s origins, for that could be considered the 13th differentiator.

“Our strength is that we were born on the shop floor. Our founder was one of the first in the industry to begin exploring the industrial internet of things (IIoT). We began to build interfaces and software applications that would provide real-time feedback to operations management on how their processes were going, what it took to make them, and to keep track of the equipment involved in executing them. We provide hardware and software produced by our own developers and engineers to tie information about the equipment back into enterprise software for analysis. The fact that this is all native to IQMS, born from its shop-floor roots, is very unusual in the market.”

From these beginnings a powerful and efficient software solution for manufacturers has evolved, featuring a number of elements that make it stand out.



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The Differentiators

The following key differentiators distinguish IQMS from other solutions in the enterprise software for manufacturing space:

- Native integration of ERP and MES
- A single database that makes it easy to scale for growth
- Twenty-one pre-made bills of material (BOMs)
- Preconfigured standards
- Drag and drop scheduling
- Lot and serial traceability
- Depth of quality modules
- Integrated electronic data exchange (EDI)
- Lower maintenance and user costs through a single, consistent user interface
- Extensive drill-down functionality
- Implementation by design
- Choice is the new cloud

Native integration of ERP and MES

The overarching differentiator for IQMS is the unique combination of factory floor process control and monitoring coupled with ERP functionality. Most systems are either ERP or MES; with IQMS, these systems are integrated as one native solution.

This integration provides a true, real-time vision or scoreboard of the shop floor. Typically systems use an approach where ERP and MES must be integrated from different providers, which often results in a batch period of time, as much as four hours, before the manufacturing executive is actually getting data that's happening on the shop floor. In today's manufacturing environment, this latency is counter-competitive. Beyond the gaps and delays, there are also redundancies in which recipes and bills of materials (BOMs), for example, exist in multiple systems because of the separate databases for each system and no direct linkage between them.

“By bringing MES and ERP together in a single solution, IQMS provides data within seconds,” says Steve Modrall, vice president of sales at IQMS. “So manufacturers can quickly identify if they are making parts correctly or if machinery isn't running properly because of speed or cycle time, even down to the process parameters of the machine.”

The real-time process monitoring of the MES built into the ERP empowers decision-makers to see what is going on the shop floor in real time, and also provides an artifact trail for traceability. While production is ongoing, as parts are being produced, not only do manufacturers have the lot and serial numbers of components, but also the ability to tie them back to the machine and how it ran when the process took place.

Real-time process monitoring provides the ability to:

- Receive data directly from a device (e.g., a PLC) in real time.
- Automatically log data into a historian database.
- View real-time data through a common web browser.
- View Statistical Process Control (SPC) data in real time with warnings of adverse trends.
- Maintain data required for traceability, item number, work order, manufacturing number, lot number, date, time, sample ID, etc.
- Download and upload machine setup parameters.
- Receive production monitoring cycles over Ethernet.



Overcoming Complexity

While some of the systems IQMS have replaced are relatively new, customers still found they outgrew these systems rapidly. Either there were limits in terms of complexity of the set up or there was a struggle to handle operations that the databases used in their individual enterprise systems (e.g., MES and ERP as separate systems) as the company grew.

On the other hand, IQMS uses a single, Oracle database that is the most robust and powerful available. In terms of performance and scalability, there are no limitations to it.

“If we are doing a lot of process parameter capture, we may add a second instance of the database as a historian; but the majority of our users, whether they are a five-user system or a connected system of 10 to 12 plants, are using a single database,” notes Modrall. “The system is designed to scale as the business grows, and the system’s database is built for that.”

Twenty-One Pre-Made Bills of Material

The way IQMS looks at manufacturing is that one size does not fit all. Processes of production techniques are very different, but many systems limit manufacturers to one way of capturing information. Not so with IQMS.

Whereas most ERP systems limit a user to one BOM and routing for a given part number, IQMS has combined BOM and routing into a single entity, a bill of manufacturing or manufacturing template. Even more unique, it allows an unlimited number for a given item. “In terms of the 21 manufacturing types the pre-made templates represent, we recognize that not all manufacturing processes are the same or are treated the same,” says Modrall.

Many processes require different information. For instance, if a manufacturer is stamping out a metal part, the trim on the outside needs to be tracked and measured because it can be sold as scrap. But if that’s being called out in the BOM, it’s not the same as if that part were hand assembled.

IQMS has modeled 21 common processes in the manufacturing world that have unique attributes and enabled end users to create their own BOMs outside of these templates.

“What’s more, the specific templates helps seed the initial setup of our system, giving customers fewer questions to deal with versus having generic BOMs that require them to identify behavior settings and best practices or workarounds on their own,” says Potoczak. “By having these pre-made multiples at hand, customers get a head start, providing them an opportunity to quickly deploy information in a style that works for them.”

Preconfigured Standards

Different industries have standardized reporting requirements. For example, the automotive sector has production part approval process (PPAP); those sectors governed by the FDA and for various ISO standards have corrective action/preventive action (CAPAs). For manufacturers requiring industry-specific tools and reports, IQMS preconfigures them in its solution, automating the necessary documentation. This saves time, cost, and minimizes the risk of error.

Drag and Drop Scheduling

To actually make something requires that a number of elements come together at the same time: a machine, the right tooling, raw materials, work instructions, an operator. This is what scheduling is about: coordinating the elements at an appointed time and occupying them for a period of time.

When a schedule changes, re-provisioning of resources ripples across the enterprise. What's unique about IQMS' drag and drop scheduling is its speed and ease of use. When a change is made (by dragging and dropping a new element or elements into the mix), the system instantly and automatically re-provisions resources to the best fit. The speed with which it manages this complexity is amazing—a real advantage on the production floor.

Lot and Serial Traceability

From the time materials or components are introduced to the organization, IQMS captures lot or serial information at the time of receipt, as well as attributes or test data. “We may have customers that buy, for example, steel,” explains Bieszczat. “It may include certificates or heat-treating information. That information gets loaded at the time of receipt, so when it goes into production, all that attribute information follows it through the process. So the manufacturer can see the entire genealogy of the part when produced.”

Users may also do a reverse lot number look-up tree. For instance, a customer may come to the manufacturer and say a bad box of components was received. Typically, they would look up the serial number, the lot number, the component number, and all other parts affected by that component. In a manual world, the manufacture tells the customer, “let me look into that and get back to you,” and the process could take many days. With IQMS, they can query those parameters and have an answer in seconds.

This functionality is useful for internal purposes as well. When product is produced and a final inspection raises an issue or questions, the organization can use lot and serial traceability to see if a component, material, or process used was the source. Isolating that factor and understanding how much of the product was affected will determine how to proceed with the product: scrapping, reworking, or recalling. It's key to identifying the severity and scope of the issue. This ability is particularly important in highly regulated industries (e.g., medical device, automotive, aerospace, food and drug) where health and safety are paramount concerns.



Depth of Quality Modules

IQMS provides multiple levels of quality. In manufacturing, a key aspect of quality is a document management system. It needs a repository to check in, manage, and update important documents and files to help with specifications, policies, procedures, work instructions, references to customer information, drawings, CAD files, etc. It needs to include anything linked to internal design information, such as tooling and parts. That's the first level of quality.

Another level includes certifications or regulations based on industry. There's great importance in having policies, standardized specifications, and work instructions that are captured by the system so that reference files can be easily accessed to assure that the right information is being used to design and manufacture product compliant with industry regulations and standards.

A third level is Statistical Process Control (SPC), an industry-standard methodology for measuring and controlling quality during the manufacturing process. SPC is used to ensure that manufacturing processes operate at full potential. "So there are multiple levels of quality, and the customer can leverage whatever level or levels work for them," says Potoczak. They work together to provide increasing levels of sophistication.

"One of the areas where we play particularly well is in repetitive machine-based manufacturing," notes Modrall. "By tying in quality, we can notify even at the time of order entry if there are quality concerns, if things are on hold or quarantined. IQMS gives notifications about quality control or process control across the entire enterprise where appropriate, not just production."

Integrated Electronic Data Interchange

Most software vendors in the manufacturing space use a third-party provider for EDI. IQMS provides EDI as an integrated part of its software solution. “Many companies will tell you EDI is pretty much a commodity that they will provide at no additional cost; but the big disconnect is that EDI is critical, since it is the communication from your customer or supplier to you,” says Modrall. “Ninety percent of the time we find that the information gets treated differently depending on the relationship with the customer or supplier.” For example, if a company is doing business with a major automotive manufacturer, the way that manufacturer sends the information and how the company digests it is key. That’s the special aspect IQMS’ EDI brings to the table. In a traditional setting, a company may get the EDI information, then have customer service personnel pour through the data to see what’s changed. Does the pricing match? Do the quantities match? Are the shipping dates accurate?

Instead, IQMS EDI sets basic rules in place for business with a specific trading partner and only notifies the users of exceptions. A rule may say if an order quantity changes plus or minus five percent, a notification should be issued. Similarly, rules can be set for other parameters such as shipping dates. “So we have a watchdog-type utility,” says Modrall. “If the data is within the rule set established in IQMS EDI, it simply flows; if there is an exception, a notification is issued. There is no need to sift through data day to day.”

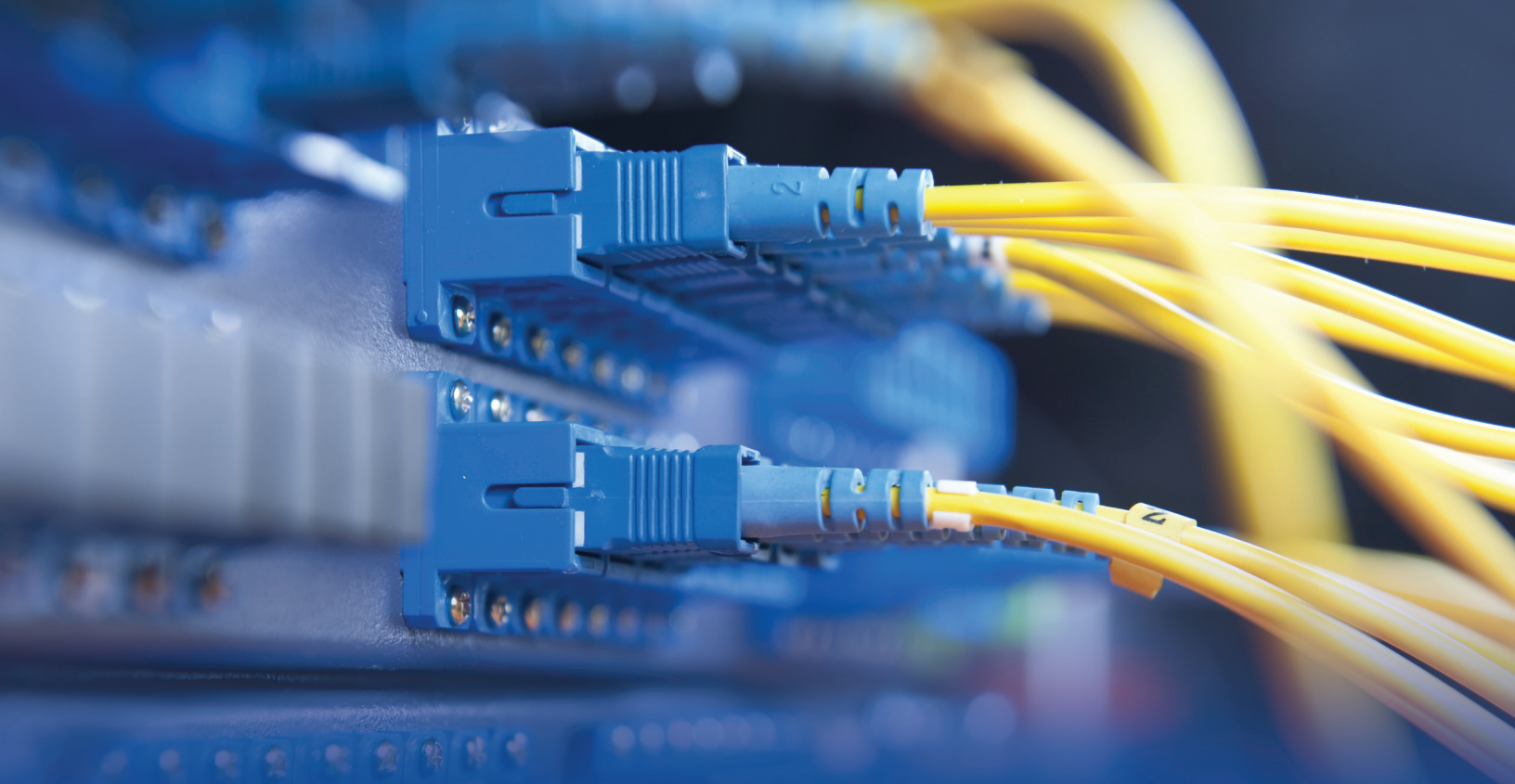
Further, all EDI data is stored historically based on sales order and work order information. “This aspect can be a valuable tool,” says Potoczak, “For example, we had a manufacturer that had a customer wanting to negotiate pricing down; but they were able to leverage the EDI history to show the additional expense incurred due to expedited freight and changes of release information driven by the customer to justify maintaining the pricing as it stood.”

The accuracy of EDI is critical. One of the most frustrating things for a customer is to receive incorrect information about what is shipped to them or when a supplier cannot correctly understand the requirements or schedules. Having errors or mistakes in EDI will quickly sour a customer relationship.

As such, manufacturers find it advantageous to have a single source that takes responsibility for EDI. If they have to go to multiple sources to resolve issues (i.e., the software vendor for ingoing, the third-party provider for outgoing), managing these problems becomes more complex and time consuming. Having a software provider whose solution has integrated EDI facilitates the important need of solving any issues quickly and simply.

Lower Maintenance Costs

Because the IQMS solution uses a single database for all functionality, and because the manufacturer only needs to work with a single vendor, there’s no need for training on multiple interfaces. Moreover, the solution combines database and IQMS support so that customers don’t need a separate contract with Oracle, but can deal directly with IQMS. The company provides all support, and all updates to the software are included in the initial cost of the system.



Lower User Costs Through a Single, Consistent User Interface

Of course, one large, integrated system is easier to manage than a conglomeration of multiple systems. The latter means more training, time, and cost, as well as the complexity of administering multiple programs. With IQMS, there is a single package to administer, and for users, a single, consistent interface.

For those personnel who only use the system sporadically, jumping from solution to solution is certainly less efficient and more challenging. Further, multiple systems increase the likelihood that information is not synchronized, raising the specter of gaps or de facto errors. This can lead to costs due to mistakes, wrong corrective actions, and ignoring the real issues—all leading to wasted time and effort, and higher risk. “It’s not just the user interface; it’s the ability to adopt a business system quickly,” says Modrall. “It lowers the impact of change management across the board.”

Extensive Drill-Down Functionality

One of IQMS’ most powerful and popular functions is the drill-down functionality where a simple “right click” on any given screen brings up direct links related to the material at hand. For example, if a user is looking at inventory on a screen, they can simply right click on a product to see all relevant information relating to it (e.g., engineering, terms and conditions, product details). If a user is looking at a process-monitoring screen and sees that a machine lights up, they can click on the machine to see all detailed data relating to it, both transactional and real time. The tool is extremely simple, and provides the user with the ability to go from high-level information to granular detail in an instant.

“You are always one to two clicks away from any information you seek,” says Modrall. “It’s key, because it allows you to be highly responsive when a customer calls and wants to know where a shipment is. Typically this would mean looking up a customer PO, looking for a packing slip, looking for an invoice—a distended and time-consuming process. With IQMS, you can drill down for all the information in seconds.”

Implementation by Design

When manufacturers buy an enterprise software system, they often fear an implementation that takes forever and costs millions of dollars. It's not only painfully costly; it's also disruptive to operations. IQMS' Implementation by Design takes a process that manufacturers are very familiar with and mirrors it with the implementation process:

THE MANUFACTURING PROCESS Blueprint > Prototype > Testing > Tooling > Production Sample > Production
THE IMPLEMENTATION PROCESS Discovery > Prototype Build > Prototype Pilot > Live Build > Live Pilot > Go Live

"This is a logical process that manufacturers understand," says Steve Bieszczat, chief marketing officer at IQMS. "It makes it less daunting for them, helps streamline communications between their implementation team and ours, and in the end speeds the process significantly." Consequently, IQMS implementations typically take a fraction of the time compared to typical MES and ERP implementations.

Choice is the New Cloud

The cloud can be a highly effective deployment model for ERP, but not all cloud options are equal, and for some companies, the cloud may not be the right solution. Deployment options from IQMS are designed to give the manufacturer the broadest choice:

DEPLOYMENT OPTIONS			
Topic	On-Premise	Hosted/Hybrid Cloud	SaaS
License	Perpetual	Perpetual	Subscription
Location	Customer defined	Data center	Data center
Managed Services	Optional	Included in service	Included in subscription
Implementation	Paid as incurred	Paid as incurred	Paid as incurred
Support	Periodic Billing	Periodic billing	Included in subscription

Regardless of deployment, IQMS has proven to be less expensive to maintain than comparable systems.

The Future

Moving forward, IQMS will continue to build out its unique value proposition of ERP and MES in a single integrated system. The company's goal is to become the first recognized single source Manufacturing Operations Management (MOM) provider.

To do that, we understand the need to capture the full value of the IIoT in the manufacturing environment as it moves inexorably to what has been called the fourth industrial revolution: Industry 4.0 or Smart Manufacturing. Doing so will break down the final barriers in supply chain connectivity and interoperability.

As we go down this path, we recognize that ease-of-use, implementation speed, and success are keys to achieving rapid ROI for ERP and MES. Moving forward, we will never forget our roots on the shop floor, continually tapping that foundation for our customers' benefit.

About IQMS

Since 1989, IQMS has been designing and developing ERP software for the repetitive, process and discrete manufacturing industries. Today, IQMS provides a comprehensive real-time MES and manufacturing ERP software solution to the automotive, medical, packing, consumer goods and other manufacturing markets. The innovative, single-database enterprise software solution, EnterpriseIQ, offers a scalable system designed to adeptly grow with the client and complete business functionality, including accounting, quality control, supply chain, CRM and eBusiness. With offices across North America, Europe and Asia, IQMS serves manufacturers around the world.

If you would like to learn more about IQMS' comprehensive ERP solution, please visit www.iqms.com.



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