

**Solution Selection Guide**

**Manufacturing Operations Management  
(MOM) Software**

Mark Davidson, September 2013



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## MOM Market Overview

Manufacturing Operations Management (MOM) software applications provide critical support and enforcement of industrial / manufacturing processes and procedures, while facilitating a bridge between enterprise / business operations systems and the industrial automation systems that provide plant floor control. When coordinated and used effectively, the broad scope and set of MOM software applications enables organizations to address the industry’s toughest challenges – and to do so dynamically in production real-time.

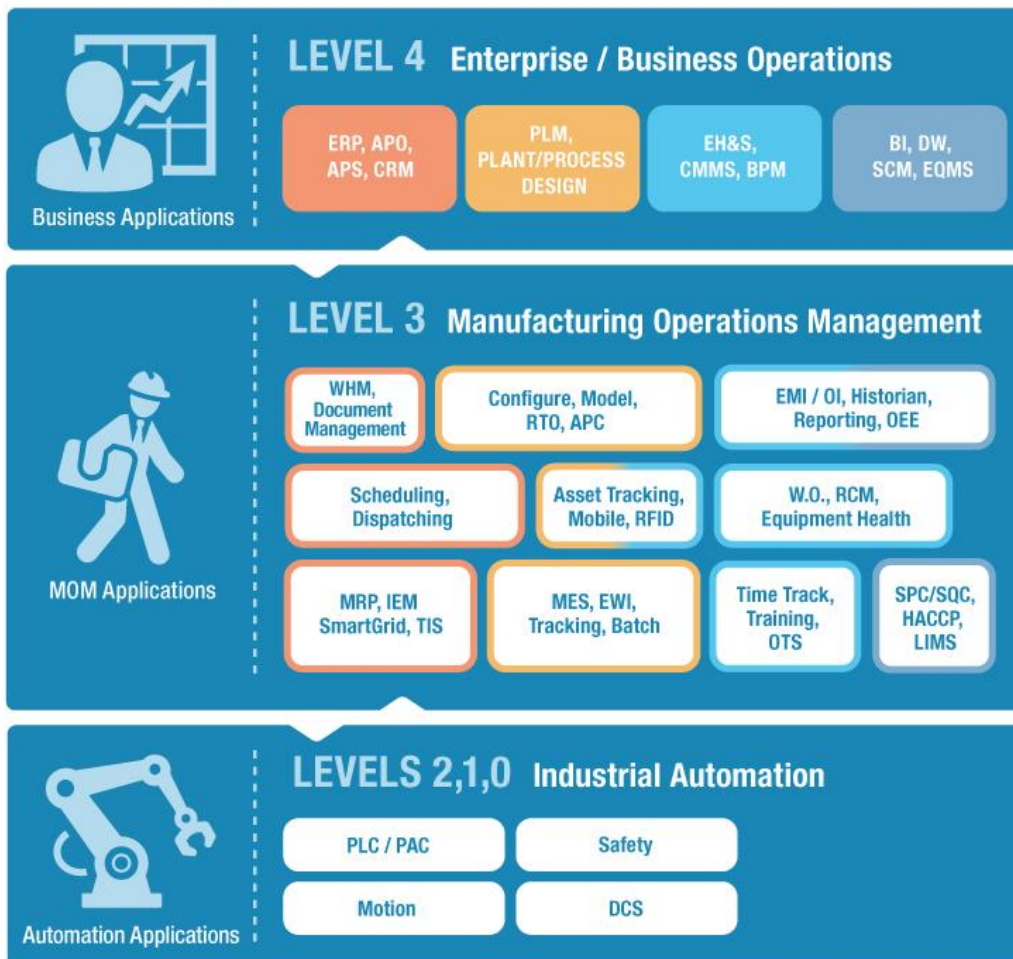
Top industrial / manufacturing business challenges include: increasing manufacturing profitability, obtaining a higher return on assets, lowering business risk, and improving customer responsiveness and service levels. Each business challenge has to be

managed while simultaneously dealing with day-to-day challenges inside each plant or production facility. The corresponding manufacturing challenges include: introducing new products faster and more efficiently, managing suppliers and inventories, ensuring safe and repeatable operations while managing the cost of quality, and engaging employees and partners in continuous improvement programs.

To overcome these challenges, organizations have utilized a mix of in-house IT application developments and spreadsheets, in combination with packaged software applications that target specific manufacturing issues, in addition to leveraging existing software, systems, information and workflows that originate within business and automation applications.

Although these targeted solutions have helped to

## MANUFACTURING OPERATIONS MANAGEMENT Software / Application View



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improve business performance, in many cases the improvements have not been easy to replicate and standardize across the entire supply and demand chains of a manufacturing enterprise. In addition, many of the improvements at the individual plant level have not always been done in a coordinated, end-to-end fashion with business processes, thereby not generating the full value potential. At the same time, new technologies and integration standards have emerged in recent years that are proving to simplify integration costs, provide broader enterprise manufacturing scope, and enable real-time decision making and collaboration across entire manufacturing organizations, along with their partners.

The market for MOM software solutions continues to evolve and mature, with a good selection of full scope Manufacturing Execution System (MES) and Enterprise Resource Planning (ERP) suppliers extending their offerings with better Manufacturing / Operations Intelligence, mobile technologies, and improved workflow and process integration across more user roles and existing systems. Some MOM suppliers are also investing in flexible, managed development, integration and collaboration platforms, as well as cloud technologies that will facilitate rapid global deployments of highly integrated business and

manufacturing solutions. It is important to ensure that the software chosen meets the real-time performance, availability, and ease of use criteria required for the many different roles across an industrial / manufacturing organization. In addition, it is critical that the software is easily reconfigurable, adaptable and agile to support continuous improvement activities. MOM systems need to be living, adapting systems that can support evolving manufacturing strategies and people to create a competitive advantage.

Since each vertical manufacturing industry has its own set of unique challenges, terminologies and approaches, you will find that no one MOM software supplier is superlative across every industry.

Because this market is growing in scope and complexity, it is important for companies to take an analytical and comparative approach to selecting the right solution.

This guide delivers extensive information on 20 top vendors, offering readers the ability to make a shortlist of potential MOM solutions to fit their needs.

## Using the Solution Selection Guide

The MOM space is growing in terms of both packaged functionalities and industry-specific solutions, which is challenging for companies trying to create a shortlist of potential vendors. Any organization interested in implementing an MOM should take the appropriate steps for determining which solution is right for its operations. First, current capabilities, functionalities, and IT architectures should be assessed. The identification of where investments have been made in ERP, MES, Historians, Industrial Automation, point solutions, or other applications should be used as part of the criteria for choosing a vendor.

Next, because the selection and implementation of a MOM solution takes significant resources, the educational process is integral for a successful investment. The LNS Research *MOM Solution Selection Guide* aims to simplify this process. Covering a total of 20 top vendors, it offers a snapshot of each company as well as a brief analysis. The guide also has an individualized table for each vendor, providing an extensive overview in a single location. The table covers the following areas:

- **Industries Served:** Lists the industries as well as various sub-verticals served by vendors. Ex: Chemicals, Pharmaceuticals, Automotive, etc.
- **MOM Functionality:** Lists the MOM functionalities offered by vendors. Ex: Planning, Scheduling & Dispatching, Manufacturing Production Execution, Employee / Labor Management, Manufacturing / Operations Intelligence, Quality Process Management, etc.
- **Company Sizes Served:** Lists the company sizes targeted by vendors. Ex: Small, Medium and Large enterprises
- **Geographies Served:** Lists the regions covered by vendors. Ex: North America, Europe, etc.
- **Technology Development Platforms:** Lists the platforms used by vendors to develop and integrate solutions. Ex: Java / J2EE, Microsoft .NET, etc.
- **Integration Standards Supported:** Lists the new standards supported by vendors that

support interoperability and ease integration efforts. Ex. ISA-95, OAGIS, OPC UA, etc.

- **Technology Delivery Model:** Lists the delivery model options offered by vendors. Ex: On-premise, Cloud, etc.
- **Partner Strategy:** Lists the quantity and some names of key qualified / certified delivery partners for the vendors. Some vendors take less of a partnering strategy and more of total services and solution approach and these will be noted.
- **Time to Solution Value:** Lists the average implementation and ROI times, along with the shortest repeat implementation time as reported by the vendors. Please note that these need to be further evaluated against the solution scope relative to functionality and number of plants deployed.

Broken down further, each of the areas in the table is categorized in the following three ways:

- **Total Coverage Area:** Includes all areas covered by vendor regardless of strength.
- **Areas of Strength:** Shows the areas in which LNS Research believes the vendor stands out in the market based on experience and customer success
- **Emerging Strength:** Lists the areas in which LNS Research believes the vendor is investing resources and gaining a market presence

This guide serves as a critical executive resource for moving forward on the decision of selecting an MOM provider. After a careful selection process, the LNS Research analyst team attained this information through a structured survey, along with a number of briefings and inquiry discussions with each vendor. We believe that the functionalities offered by each of these vendors meet the needs of the market as described in the sections.

Once a shortlist of vendors has been created with the information in the *MOM Solution Selection Guide*, decision-makers should work with their teams to build a Request for Proposal (RFP) that can be sent to prospective vendors. After getting feedback, a cross-functional committee comprised of executives and

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plant managers across the value chain should make the final decision.

*It should be noted that while there are 20 vendors included in this report, other vendors either chose not to partake in this project or were unresponsive to LNS Research's briefing requests.*

*Although they are not represented in the guide, OSISoft deserves a look as significant provider of Historian and*

*Manufacturing / Operations Intelligence software solutions.*

*Also not represented in the guide, MPDV deserves consideration by discrete manufacturing companies looking for a modular Manufacturing Execution System that covers production, human resources and quality management functions, with the ability to integrate closely with an SAP ERP business system environment.*

### Solution Providers in Detail

#### ABB

Based out of Zurich, Switzerland, and with over 145,000 employees, ABB is best known as a powerhouse in automation and energy management. What is less known, is that for the past 13 years, ABB has also been a software and industry applications provider in the MOM solutions space, with open connectivity and integration to business systems and non-ABB automation systems and equipment. Another little known fact is that ABB's integrated MOM solutions are deployed globally across scores of ABB manufacturing plants and integrated with their internal SAP business system instances.

At the core of ABB's MOM offering is a high speed, high performance Historian, called cpmPlus History, which is used to integrate hundreds of thousands of different data points from disparate sources. Also at the core of the offering is smart client visualization and Advanced Process Control capabilities.

ABB's MOM offerings also include a set of cross-industry applications, as well as industry specific solutions that utilize the core and cross-industry underpinnings. MOM cross-industry applications include MES, OEE, Alarm Management and Industrial Energy Management.

The Industrial Energy Management application is particularly well suited for optimizing costs around electric utility purchasing and co-generation strategies, as well as for managing general energy and water resources across a broad range of industries.

ABB takes a holistic industry solution approach to market, armed with a combination of Industrial Automation and MOM hardware, software and services capabilities. Their industry focus is primarily in process, hybrid industries, and utilities - with key solution strengths in Power (leveraging their acquisition of Ventyx Power Transmission and Distribution solutions), Mining & Minerals (leveraging their acquisition of MINCOM for complete technical

mining solutions in the areas of mine planning, asset management, production accounting, business intelligence and analytics), Chemicals, Oil & Gas and Paper.

Moving forward, ABB has a strategy to continue to invest in improving and harmonizing their industry solutions capabilities utilizing their core cpmPlus platform and cross-industry applications. For MOM solutions, ABB is also starting to leverage more of the cross-industry application functionality coming from the Ventyx acquisition. Examples include electronic Shift Operations Management capabilities for coordinating control room and mobile operational procedures, Equipment Reliability suite for preventative and predictive plant asset monitoring, and the Focal Point packaged business intelligence and analytics. They are also investing in improving their core MOM platform in the areas of Cloud hosting, ubiquitous visualization and big data analytics.

We would like to see ABB's core cpmPlus software platform and cross-industry applications to evolve over time into LNS Research vision of agile, next generation, MOM integration and collaboration platforms and lightweight / modular 'apps.'

Based on briefings with ABB executives, we see ABB continuing to invest to be a long-term MOM provider for large process manufacturing companies who are looking for turnkey industry solutions. Not all industry solutions from ABB are pre-packaged to contain the full set of MOM functionality that the company is potentially capable of delivering; so each customer's solution may likely be a customized / configured instance.

ABB prides itself in being able to design, deliver and support integrated industry solutions that can span from devices to enterprise business systems, virtually anywhere in the world.



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### ABB at a Glance

<http://www.abb.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Medical Devices</li> <li>• Metals</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Publishing</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Chemicals</li> <li>• Food</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Paper/Lumber/Timber</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Beverage</li> <li>• Consumer Durable Goods</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Industrial Energy Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Advanced Control &amp; Optimization</li> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application</li> </ul>	<ul style="list-style-type: none"> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Industrial Energy Mgmt.</li> <li>• Real-Time Production Visualization</li> <li>• Advanced Control &amp; Optimization</li> <li>• Batch Mgmt.</li> <li>• Automation / Control System Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• Employee / Labor Mgmt.</li> <li>• Integration &amp; Collaboration Platform</li> </ul>

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	<ul style="list-style-type: none"> <li>Integration</li> <li>Automation / Control System Integration</li> <li>Integration &amp; Collaboration Platform</li> </ul>		
Company Sizes Served	<ul style="list-style-type: none"> <li>Medium (\$50M-\$1B Revenue)</li> <li>Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>North America</li> <li>South &amp; Central America</li> <li>Europe</li> <li>APAC</li> <li>Middle East</li> <li>Africa</li> <li>AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>North America</li> <li>Europe</li> <li>APAC</li> <li>AZ / NZ</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>Microsoft .NET</li> <li>Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>Microsoft .NET</li> <li>Java / J2EE</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>ISA-95 / B2MML</li> <li>ISA-88</li> <li>ISA-99</li> <li>OAGIS</li> <li>OPC Classic</li> <li>OPC UA</li> <li>ODBC</li> <li>Web Services</li> <li>SAP MII</li> <li>Microsoft .NET</li> <li>IBM Websphere</li> </ul>	<ul style="list-style-type: none"> <li>ISA-95 / B2MML</li> <li>ISA-88</li> <li>ISA-99</li> <li>OPC Classic</li> <li>OPC UA</li> <li>ODBC</li> <li>Web Services</li> <li>SAP MII</li> <li>Microsoft .NET</li> <li>IBM Websphere</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>On-Premise</li> <li>Hosted</li> <li>SAAS</li> <li>Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>On-Premise</li> <li>SAAS</li> </ul>	<ul style="list-style-type: none"> <li>Cloud Based</li> </ul>
Partner Strategy	<ul style="list-style-type: none"> <li>3 Certified Delivery Partners in Europe</li> <li>ABB is a Turnkey Industry Solutions Provider, Rather Than a MOM Software Provider</li> </ul>		
Time to Solution Value		<ul style="list-style-type: none"> <li>Avg. Implementation: 3-6 Months</li> <li>Fastest Repeat Implementation: &lt;3 Months</li> <li>Avg. ROI: 3-6 Months</li> </ul>	

### *Aegis Software*

Based out of Horsham, PA, and now with offices in Germany, UK, China, Singapore and Japan, Aegis Software's roots have been in providing rapid, turnkey MOM solutions into the Electronics and High Technology manufacturing industries. With 16 years of history and an installed base of 1,600 factory sites, its FactoryLogix offering has evolved and is also now proven in other discrete manufacturing industries including: Medical Devices, Aerospace and Defense, and Telecommunications.

Aegis Software recently expanded both its geographical delivery capabilities and its product portfolio capabilities with the November, 2012 acquisition of diplan GMBH – a provider of advanced production planning and materials logistics software. This new software capability has been integrated into the re-architected, Microsoft .NET and Web Services based, FactoryLogix suite.

Major functional areas of the re-architected FactoryLogix include: New Product Introduction (NPI) – full management and visibility of the new product introduction activities and processes, Logistics – capabilities that span receiving, shop floor kitting and production control, multi levels of assembly management, through warehousing and shipping, Production – paperless factory floor production, configuration and quality management, and Analytics – real-time operations dashboards and analytics on local and mobile devices, and user-configured reports.

A core strength of Aegis Software's offerings is the ability to take design data from the PLM systems used in the NPI process and to track and extend the use of this data across the entire manufacturing and product life-cycle. This capability includes the translation of pertinent design data directly into electronics manufacturing and CNC machine setups. Another FactoryLogix product strength is the vast library of high speed data acquisition adapters for connecting to process, assembly and test machinery.

In fact, the Aegis Software offering that accomplishes this functionality is present in a large number of manufacturing sites that don't use the full FactoryLogix MOM suite. In the electronics industry, Aegis Software

has deep partnerships with a majority of the surface mount technology machine providers, whereby these machine vendors embed Aegis Software's machine programming software into their machines.

FactoryLogix is well suited to handle multiple modes of manufacturing including continuous flow and cell manufacturing. FactoryLogix software can manage multiple levels of sub and system assembly, return material authorizations (RMAs), along with interactions with product configuration software. In fact, right out of the box, FactoryLogix software supports 'configure to order' manufacturing operations.

In our discussions with Aegis Software executives, they indicated that they can address most of the customer specific requirements that they encounter by configuring their software, versus programming or coding. In order to simplify the need to meet key industry regulatory requirements, Aegis Software offerings have been developed and designed to meet GAMP 5, ITAR, and FDA CFR 21 Part 11.

Aegis Software's engineering team typically handles the integration needs of their customers to ensure timely and quality solutions, however they also provide access to their software interfaces for third party integrators or in-house IT staff. Aegis takes an approach whereby they do a very detailed up-front scoping and functional specification, and then deliver to that specification within the specified timeframe and the stated cost.

In our discussions, Aegis acknowledged that pre-sales consulting to perform this detailed scoping was one of the limiting factors on sales velocity. In our assessment, this may also limit the speed at which Aegis Software can expand its footprint into other discrete manufacturing opportunities that its software could address. These include Automotive, Consumer Durable Goods, and Industrial Equipment industries.

Based on the impressive 'Time to Solution Value' metrics reported by Aegis Software, the re-architected FactoryLogix software platform appears to be aligning well with LNS Research's vision of an agile, next generation, MOM integration and collaboration platforms and lightweight / modular 'apps.'

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## Aegis Software at a Glance

<http://www.aiscorp.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>Automotive</li> <li>Aerospace and Defense</li> <li>Consumer Durable Goods</li> <li>High Technology</li> <li>Medical Devices</li> <li>Industrial Equipment</li> <li>Telecommunications</li> </ul>	<ul style="list-style-type: none"> <li>Aerospace and Defense</li> <li>High Technology</li> <li>Medical Devices</li> <li>Telecommunications</li> </ul>	<ul style="list-style-type: none"> <li>Automotive</li> <li>Consumer Durable Goods</li> <li>Industrial Equipment</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>Production Planning, Scheduling &amp; Dispatching</li> <li>Mfg. Process Mgmt. / Workflow</li> <li>WIP Inventory Mgmt. &amp; Optimization</li> <li>Global Traceability &amp; Genealogy</li> <li>Quality Process Mgmt.</li> <li>SPC / SQC</li> <li>Document Mgmt.</li> <li>Plant Data Historization</li> <li>Mfg. / Operations Intelligence</li> <li>Receiving, Warehousing &amp; Shipping</li> <li>Real-Time Production Visualization</li> <li>Mobile Operations</li> <li>Mfg. / Production Execution</li> <li>PLM and/or Plant Design Integration</li> <li>Enterprise Application Integration</li> <li>Automation / Control System Integration</li> <li>Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>Production Planning, Scheduling &amp; Dispatching</li> <li>Mfg. Process Mgmt. / Workflow</li> <li>WIP Inventory Mgmt. &amp; Optimization</li> <li>Global Traceability &amp; Genealogy</li> <li>Document Mgmt.</li> <li>Receiving, Warehousing &amp; Shipping</li> <li>Mobile Operations</li> <li>Mfg. / Production Execution</li> <li>PLM and/or Plant Design Integration</li> <li>Automation / Control System Integration</li> <li>Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>Mobile Operations</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>Small (0-\$50M Revenue)</li> <li>Medium (\$50M-\$1B Revenue)</li> <li>Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>Small (0-\$50M Revenue)</li> <li>Medium (\$50M-\$1B Revenue)</li> <li>Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>North America</li> <li>South &amp; Central America</li> <li>Europe</li> <li>APAC</li> </ul>	<ul style="list-style-type: none"> <li>North America</li> <li>Europe</li> <li>APAC</li> </ul>	<ul style="list-style-type: none"> <li>South &amp; Central America</li> </ul>
Technology Development	<ul style="list-style-type: none"> <li>Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>Microsoft .NET</li> </ul>	

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Platforms			
Integration Standards Supported	<ul style="list-style-type: none"> <li>• OPC Classic</li> <li>• Web Services</li> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• OPC Classic</li> <li>• Web Services</li> <li>• Microsoft .NET</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud Based</li> </ul>
Partner Strategy	<ul style="list-style-type: none"> <li>• Aegis Software is a Turnkey Industry Solutions Provider and Typically Does All of the Consulting, Scoping, Integration, Implementation and Support</li> </ul>		
Time to Solution Value		<ul style="list-style-type: none"> <li>• Avg. Implementation: 3-6 Months</li> <li>• Fastest Repeat Implementation: &lt;3 Months</li> <li>• Avg. ROI: 3-6 Months</li> </ul>	

### AspenTech

Established in 1981, headquartered in Burlington, MA, and with 26 offices supporting customers around the globe, AspenTech is best known for supply chain optimization, simulation and modeling, advanced control, and plant information systems. AspenTech has R&D centers in Massachusetts and Texas in the U.S., as well as in China.

AspenTech capabilities in MOM software space have evolved over more than three decades through a series of acquisitions and developments. Core strengths are in the process manufacturing markets that require sophisticated process and production engineering models across the planning, design, operation, improvement and optimization life-cycle. AspenTech is strong in advanced process control and optimization of operations, along with the associated information management capabilities – in particular: Oil & Gas, Chemicals / Petrochemicals, Pharmaceuticals and Utilities. AspenTech is a trusted supplier to many of the top manufacturers in these industries, and they have built their success in combination with over 50 global partners that can help provide MOM solutions around the globe.

AspenTech is a pure-play software and services company that has always offered its solutions on top of their customer's existing automation and enterprise system investments in a hardware agnostic fashion.

AspenTech's product portfolio, which spans Engineering, Manufacturing Operations and Supply Chain, encompasses approximately 100 software products. AspenTech has integrated these products across the above business areas through its Integration Foundation. This enables integration to third party solutions and systems utilizing Microsoft Web Services, TIBCO and Informatica technologies.

This integration framework has been used to link together the company's simulation and modeling (Aspen Plus and Aspen HYSYS), supply chain planning and scheduling (Aspen PIMS), manufacturing execution (aspenONE MES) and information management (InfoPlus.21) offerings.

The latest version 8.2 of aspenONE was released in May, 2013, and it contains many improvements and modernizations in areas of modeling integration across the manufacturing life-cycle, ease of administration, user interface and mobile operations. The release brings new Web and mobile user interfaces to InfoPlus.21, Aspen Plus and Aspen HYSYS. This new capability supports the industry needs that LNS Research sees for better collaboration across more production personnel, as well as more timely information for real-time decision making.

AspenTech provides a common token software licensing scheme and management dashboard, which allows users to rapidly sample and deploy different applications that they select from across their software portfolio.

AspenTech's MES capabilities combine both production execution (order and recipe management, workflow) along with the associated information management, performance management and operations intelligence.

As the aspenONE integration foundation continues to evolve as their core integration and collaboration platform, we hope to see an increased focus towards LNS Research's vision of a next generation, MOM integration and collaboration platform and more lightweight / modular 'apps.'

Like many companies, AspenTech is facing the reality of retiring talent and the need to manage through this cycle without loss of quality in its products and services or 'leaking' intellectual property. Finding, training and retaining talented young professionals will be critical to maintaining the current rate of innovation and quality.

In discussions with LNS Research, it is clear that AspenTech continues to invest in refreshing all of its products, along with making their sophisticated offerings ever easier to use. This should help address the needs of the next generation of manufacturing workers who have a much higher expectation for an intuitive user experience.

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## AspenTech at a Glance

<http://www.aspentech.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Metals</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Chemicals</li> <li>• Oil &amp; Gas</li> <li>• Pharmaceuticals</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Consumer Packaged Goods</li> <li>• Metals</li> <li>• Mining</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• SPC / SQC</li> <li>• Production Asset Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Industrial Energy Mgmt.</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Advanced Control &amp; Optimization</li> <li>• Batch Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Plant Data Historization</li> <li>• Mfg. / Operations Intelligence</li> <li>• Real-Time Production Visualization</li> <li>• Advanced Control &amp; Optimization</li> <li>• Batch Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile Operations</li> <li>• Real-Time Production Visualization</li> <li>• Integration &amp; Collaboration Platform</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> </ul>	

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> <li>• TIBCO</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• Microsoft .NET</li> <li>• TIBCO</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud Based</li> </ul>
Partner Strategy		<ul style="list-style-type: none"> <li>• 51 Certified Consulting &amp; Delivery Partners</li> <li>• Includes: CGI, Logexsoft, PlantVision, Rolta, Orbis MES Ltd.</li> </ul>	
Time to Solution Value		<ul style="list-style-type: none"> <li>• Avg. Implementation: 3-6 Months</li> <li>• Fastest Repeat Implementation: &lt;3 Months</li> <li>• Avg. ROI: 3-6 Months</li> </ul>	



## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

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### Camstar

Based out of Charlotte, NC, with offices worldwide, Camstar was one of the first successful companies with pre-packaged MES software. With over 29 years of operation, and by working closely to ensure the business success of its customers, Camstar has continually improved and evolved the company's offerings into a broader range of MOM functionality with the Camstar Enterprise Platform.

Camstar's solution is targeted at high volume, high complexity industries that require high quality products, heavily utilize outsourcing in production, and have to abide by strict regulations. Some of the industries that Camstar excels in are Medical Device, High Tech / Electronics and Semiconductor. According to Camstar, more than 70% of the large Medical Device manufacturers use their software.

The vendor's MOM capabilities include MES functionality that ensures production fulfillment and manufacturing best practices, Manufacturing Intelligence, Maintenance Management, Component and Product Movement, along with Quality Collaboration across supply chains.

By moving to a re-architected .NET platform almost five years ago and through acquisition, Camstar has expanded both its enterprise platform capabilities as well as its enterprise quality capabilities with SPC and handling of non-conformances. Camstar can now deliver a closed-loop process capability that helps companies achieve visibility in quality and other business performance metrics across engineering, manufacturing, and the supply chain.

These capabilities make Camstar a viable option for global, multi-site enterprises looking for a comprehensive manufacturing operations software solution.

Camstar offers out of the box industry specific functionality to speed time to value for its Medical Device, Semiconductor and Electronics industry customers.

Also regarding the software, Camstar has invested heavily in its Web-based and configurable user experience (UX), offering the capability to make quick changes to production processes and screens without the need for its customers to have dedicated IT resources. In addition, the offerings are available as a 'Software As A Service' (SAAS), which further offloads the need for in-house IT support. The vendor has also recently moved into the touch, scan, and mobile friendly application space.

The company has good relationships with integration partners, which helps with global rollouts. Its partners, among others, include IBM, TCS, and HP.

The company has a strong understanding of manufacturing processes and what it takes to deliver enterprise class software platforms. For Camstar's offerings to match the complete LNS Research vision of next generation MOM software platforms, Camstar should continue to invest in their Enterprise Platform capabilities in the areas of Cloud computing, common web and mobile visualization, and simplified network application distribution and management.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Camstar at a Glance

<http://www.camstar.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace and Defense</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Government / Public Sector</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Semiconductor</li> <li>• Telecommunications</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Semiconductor</li> </ul>	<ul style="list-style-type: none"> <li>• Automotive (OEMs)</li> <li>• Metals</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. / Production Execution</li> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration</li> </ul>	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. Production Execution</li> <li>• Mfg. / Operations Intelligence</li> <li>• Enterprise Application Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Integration &amp; Collaboration Platform</li> <li>• Mobile Operations</li> <li>• Mfg. / Operations Intelligence</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	Platform		
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> </ul>
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• Europe</li> <li>• APAC</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• ISA-99</li> <li>• OAGIS</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• OpenO&amp;M</li> <li>• ODBC</li> <li>• Web Services</li> <li>• CAx</li> <li>• SAP xMMI</li> <li>• Microsoft .NET</li> <li>• Oracle Fusion</li> <li>• IBM Websphere</li> <li>• TIBCO</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• OPC Classic</li> <li>• ODBC</li> <li>• Web Services</li> <li>• Microsoft .NET</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> <li>• SAAS</li> <li>• Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• SAAS</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud Based</li> </ul>
Partner Strategy		<ul style="list-style-type: none"> <li>• 10 Certified Delivery Partners</li> <li>• Includes: HP, IBM, TCS</li> </ul>	
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. ROI: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>• Avg. Implementation: 3-6 Months</li> <li>• Fastest Repeat Implementation: &lt;3 Months</li> </ul>	

### *Critical Manufacturing*

Based out of Porto, Portugal, and with offices in Europe (Portugal and Germany), Asia (China and Taiwan) and (USA), Critical Manufacturing was created in 2009 as a merger between a group of individuals coming from Siemens, Infineon and Qimonda – having MES experience since 1997. Critical Manufacturing is now a MOM software and solutions provider to discrete manufacturing industry customers. Primary industries served include High Technology / Electronics, Semiconductor and Medical Devices.

Critical Manufacturing is a business group within the larger Critical group of venture companies that has 400 total employees and includes Critical Links, Materials, Software, Health, and Management Consulting. This provides group synergy to Critical Manufacturing with greater scale, and breadth of related expertise and talent beyond their 80 employees. In addition, Critical Manufacturing is a Microsoft Gold Certified Partner for Software Development and as an Independent Software Vendor.

Software development is done in the Porto headquarters and the latest MOM software offering from Critical Manufacturing, cmNavigo, is described by them as a new generation of modular manufacturing execution software. cmNavigo is built on a pure Microsoft Windows Server and .NET platform, and Critical Manufacturing took the strategy to leverage as much of the Microsoft technology stack as possible to provide common application and integration services across their manufacturing software modules – without re-inventing the wheel for the software infrastructure.

In our discussions with Critical Manufacturing executives, the key differentiators of the cmNavigo offerings are significantly lower total cost of ownership (TCO), faster agility and speed of implementation, and the versatility and scalability of their modular application set. Their customers can implement just

the modules that are needed to match their needs and grow with the offering over time.

We found their platform approach to be innovative and consistent with LNS Research's vision of a next generation, MOM integration and collaboration platform, and modular 'apps.' cmNavigo is now proven in the marketplace, however we would expect to see even more impressive 'time to value' results for Critical Manufacturing's customers as customers implement the modular strategy into the future.

cmNavigo includes a critical mass of modules to cover factory integration, on-line visibility and traceability, integrated quality, operational efficiency, and operations intelligence. Additional modules and functionality are in the pipeline to make the offering more comprehensive in the future. The modular approach taken with cmNavigo should result in faster and easier upgrades to these new functionalities as they are released.

Critical Manufacturing continues to invest in a number of functional areas that the marketplace has increasing demands, including: support of user interactions on mobile devices, and advanced planning and scheduling.

In addition to the technology investments, the company is investing in growing their delivery and support team, along with developing more partnerships with local / regional systems integration companies.

We see Critical Manufacturing as an innovative and 'up and coming' provider of MOM software solutions to the discrete manufacturing industries. They appear to be focused on managing their industry, product, geographic and partner strategies using the same modular / incremental approach that they have used with their technology strategy.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Critical Manufacturing at a Glance

<http://www.criticalmanufacturing.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Semiconductor</li> </ul>	<ul style="list-style-type: none"> <li>• High Technology</li> <li>• Semiconductor</li> </ul>	<ul style="list-style-type: none"> <li>• Automotive</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Production Asset Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Quality Process Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Employee / Labor Mgmt.</li> <li>• Mobile Operations</li> <li>• Laboratory Information Mgmt.</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> </ul>	<ul style="list-style-type: none"> <li>• Europe</li> <li>• APAC</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> </ul>
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• OPC Classic</li> </ul>	<ul style="list-style-type: none"> <li>• OPC Classic</li> <li>• ODBC</li> </ul>	

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP xMMI</li> <li>• Microsoft .NET</li> <li>• TIBCO</li> <li>• SECS / GEM</li> </ul>	<ul style="list-style-type: none"> <li>• Web Services</li> <li>• Microsoft .NET</li> <li>• SECS / GEM</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> </ul>	<ul style="list-style-type: none"> <li>• Hosted</li> </ul>	<ul style="list-style-type: none"> <li>• SAAS</li> </ul>
Partner Strategy	<ul style="list-style-type: none"> <li>• 9 Certified Delivery Partners</li> <li>• Establishing at Regional / Local Level</li> </ul>		
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. Implementation: 6 Months-1 Year</li> <li>• Avg. ROI: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>• Fastest Repeat Implementation: &lt;3 Months</li> </ul>	

### *Dassault Systèmes (Apriso)*

Headquartered in Long Beach, CA, and with a major development and support center in Krakow, Poland, and offices in other continents, Apriso has been delivering an enterprise class, MOM software platform and applications since 2003. The core FlexNet architecture and application offerings were revamped using Microsoft .NET a number of years ago, and the functionality goes beyond traditional MES systems by including thousands of manufacturing business sub-processes, a user-configurable business process management (BPM) capability, and a single database schema model that supports this wide range of manufacturing data and activities. Manufacturers looking to standardize and enforce best manufacturing processes across a fleet of plants, or across their entire manufacturing enterprise, will find Apriso's offerings a good fit.

Apriso is strongest in discrete manufacturing industries and excels at supporting businesses that have complex supply chains, require paperless operations, and/or requiring global traceability. They have recently introduced a Global Traceability and Containment Solution that provides manufacturers with collaboration and visibility in order to perform detailed quality investigations and root cause analysis. The unified data model captures standardized data across production, quality, maintenance, inventory, and across the supply chain.

The company also provides a Global Manufacturing Intelligence solution that works hand in hand with FlexNet and other data sources. When working with FlexNet, it provides an out-of-the-box solution that includes access to over 400 different KPIs tailored for manufacturing.

Apriso has also been focused in providing solutions that accelerate NPI by openly integrating with multiple PLM and ERP systems for the interchange of design and bill of material information with production processes and data managed by FlexNet.

On May 29, 2013, it was announced that Apriso was being acquired by Dassault Systèmes, a world leader in 3D design software, 3D Digital Mock Up and PLM

solutions. As part of this announcement, Jim Henderson, President of Apriso states, "Now in combination with Dassault Systèmes' leadership in 3DEXPERIENCE, we are 'closing the loop' between design, engineering, manufacturing and consumer experience. Global manufacturers can now accelerate new product and process innovations into the global market."

With a longtime presence in the Product Lifecycle Management space, Dassault Systèmes also delivers quality management functionalities to the industrial setting as part of its integrated suite of PLM applications.

Manufacturers who are committed to different vendor PLM systems while leveraging Apriso's solutions should ensure that the previously open PLM strategy is not impacted by this acquisition. In addition, continued investment in the FlexNet MOM solutions' roadmap, as well as Apriso's professional services and support, will need to be sustained under this new ownership by Dassault Systèmes.

Apriso has built its success in enterprise manufacturing with a combination of tight integration to ERP systems like SAP and Oracle, along with strategic partners like Accenture, HP, IBM and Microsoft, along with an impressive network of implementation partners like Atos, Cap Gemini, InfoSys and Tata. Apriso also has formal relationships with complementary solutions companies such as SAP, Oracle, and OSISoft.

Apriso shares many of the same visions that LNS Research has for next generation MOM software platforms. Under ownership by Dassault Systèmes, we believe that the Apriso offerings should continue to invest in the FlexNet roadmap, including major enhancements such as: further enabling Microsoft collaboration technologies for its customers, evolving and modernizing FlexNet's visualization using HTML5, continuing to build coverage for more out-of-the-box Enterprise Manufacturing Intelligence (EMI) solutions, and in keeping an open approach to other PLM and design offerings that customers have committed themselves to in the marketplace.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Dassault Systèmes (Apriso) at a Glance

<http://www.aprison.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Semiconductor</li> </ul>	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Industrial Equipment</li> <li>• Packaging</li> </ul>	<ul style="list-style-type: none"> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• High Technology</li> <li>• Medical Devices</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Industrial Energy Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. Production Execution</li> <li>• Enterprise Application Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Quality Process Mgmt.</li> <li>• SPC/SQC</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Mobile Operations</li> <li>• PLM and/or Plant Design Integration</li> </ul>



## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>Automation / Control System Integration</li> <li>Integration &amp; Collaboration Platform</li> </ul>		
Company Sizes Served	<ul style="list-style-type: none"> <li>Medium (\$50M-\$1B Revenue)</li> <li>Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>Medium (\$50M-\$1B Revenue)</li> <li>Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>North America</li> <li>South &amp; Central America</li> <li>Europe</li> <li>APAC</li> <li>Middle East</li> <li>Africa</li> <li>AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>North America</li> <li>South &amp; Central America</li> <li>Europe</li> <li>APAC</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>ISA-95 / B2MML</li> <li>ISA-88</li> <li>OPC Classic</li> <li>ODBC</li> <li>Web Services</li> <li>SAP MII</li> <li>Microsoft .NET</li> <li>Oracle Fusion</li> <li>IBM Websphere</li> </ul>	<ul style="list-style-type: none"> <li>ISA-95 / B2MML</li> <li>OPC Classic</li> <li>ODBC</li> <li>Web Services</li> <li>Microsoft .NET</li> <li>Oracle Fusion</li> <li>IBM Websphere</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>On-Premise</li> <li>Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>Cloud Based</li> </ul>
Partner Strategy		<ul style="list-style-type: none"> <li>20 Certified Consulting &amp; Delivery Partners</li> <li>Includes: Accenture, Atos Origin, Cap Gemini, HP, IBM, InfoSys, Microsoft, TCS</li> </ul>	
Time to Solution Value	<ul style="list-style-type: none"> <li>Avg. Implementation: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>Fastest Repeat Implementation: &lt;3 Months</li> <li>Avg. ROI: &lt;3 Months</li> </ul>	

### *Emerson Process Management*

Based out of Round Rock, TX, and with offices worldwide, Emerson Process Management is best known as a major process instrumentation and automation systems solutions company. They entered the standalone MOM software arena with their acquisition of the Syncade offering in 2007.

Syncade software functionality covers operations functions such as translating the ERP bill of materials (BOM) into a manufacturing BOM, managing materials and work in process via manufacturing process management and workflow, all the way down through to the recipe execution with automation systems - with a strong new focus on logistics, shipments to tanks, and tracking movements across lines and equipment.

Syncade's lineage is in supporting the needs of the highly regulated Pharmaceutical industry, with key strengths in document management / training record management, material dispensing management, and authorizing recipe management while meeting industry needs like 21 CFR Part 11 compliance.

In addition to Emerson's Syncade offering, other MOM capabilities from the company's portfolio include the batch management functionality of DeltaV Batch and Batch Historian, and the functionality provided by Emerson's AMS asset performance management software. Emerson integrates data and workflows across these systems, as well as offering open communications to other systems using OPC standards and Web services.

In discussions with Emerson executives, new vertical industry applications of Syncade that are being proven beyond Pharmaceuticals include logistics and terminal systems for Oil & Gas, along with production solutions for the 'make to order' Chemical industry segment. LNS Research believes that even though their technology has broader applicability, one of Emerson's challenges is to raise awareness for their full range of MOM capabilities beyond the Pharmaceutical industry.

One of the key strengths that the larger Emerson Process Management organization brings to their MOM business is the ability to execute on multi-vendor integration projects, with the North American, European and Asia Pacific teams being in the best

position to deliver comprehensive MOM solutions. Even though their MOM solutions work with other automation systems, a large percentage of Emerson's MOM business is done in combination with their DeltaV automation projects.

In order to be even more successful with industry and geographic expansion plans, we believe that Emerson needs to invest more in their consulting and implementation partner network to increase the available resources that can effectively architect their MOM solutions.

Our discussions with Emerson indicated a committed strategy to better integrate their MOM software solution set across Syncade, DeltaV Digital Automation System, DeltaV Batch and AMS using the Syncade software platform as the basis over the next few years. This future activity should better align Emerson to LNS Research's vision of agile, next generation, MOM integration and collaboration platforms and lightweight / modular 'apps.'

These investments should also result in faster implementations and returns for their customers. As an example, Emerson is seeing more situations whereby Pharmaceutical clinical or development operations are starting with a small instance of Syncade, and then rapidly scaling to full production across multiple sites using Syncade, once the processes are proven.

Emerson is also investing in adding mobile device operations functionality in addition to their existing web based user interface. The need to support a wide range of mobile operations, maintenance and management personnel is rapidly becoming a universal requirement across all manufacturing industries.

The final area of future investment that we discussed with Emerson was the area of operations intelligence / manufacturing intelligence. Emerson recognizes the industry need to perform cross batch analytics and real time business performance.

LNS Research sees Emerson as capable MOM provider for the Pharmaceutical industry, and we look forward monitoring and reporting on their future progress.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Emerson Process Management at a Glance

<http://www.emersonprocess.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Chemicals</li> <li>• Oil &amp; Gas</li> <li>• Packaging</li> <li>• Pharmaceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Pharmaceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Oil &amp; Gas</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Mfg. / Production Execution</li> <li>• Batch Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization (Including Weigh &amp; Dispense for Pharmaceutical Industry)</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Mfg. Production Execution</li> <li>• Batch Mgmt.</li> </ul>	<ul style="list-style-type: none"> <li>• SPC/SQC</li> <li>• Mfg. / Operations Intelligence</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Advanced Control &amp; Optimization</li> <li>• Integration &amp; Collaboration Platform</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• Europe</li> <li>• APAC</li> </ul>	<ul style="list-style-type: none"> <li>• South &amp; Central America</li> <li>• Middle East</li> </ul>
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• Web Services</li> <li>• Microsoft .NET</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud Based</li> </ul>
Partner Strategy	<ul style="list-style-type: none"> <li>• 25 Certified Consulting &amp; Delivery Partners</li> <li>• Emerson typically takes prime project responsibility and supplements resources with small, local Systems Integrators</li> </ul>		
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. Implementation: 1 Year-18 Months</li> <li>• Fastest Repeat Implementation: 3-6 Months</li> <li>• Avg. ROI: 1-2 Years</li> </ul>		

### *Epicor*

Based out of Dublin, CA, with offices worldwide, Epicor is best known for its flexible enterprise software used by many mid-market corporations. However, it has also acquired and integrated a number of MOM focused software companies, putting it in a good position for production companies looking for either standalone manufacturing solutions or integrated business and manufacturing solutions.

With these strategic acquisitions, Epicor has extended its presence geographically as well as across a number of vertical manufacturing markets. Epicor's MOM offerings include the Mattec MES, which is well suited for getting additional production out of existing assets in discrete assembly and repetitive manufacturing operations.

Last year's acquisition of Solarsoft brought additional ERP capabilities to midsized manufacturing and distribution companies in industries such as Paper / Lumber / Timber, Automotive and Packaging operations. Epicor's Tropos process manufacturing software adds new coverage in Food, Beverage, Pharmaceuticals, Metals and Mining.

The acquisition of the Informance EMI offering gives Epicor's customers the ability to integrate across multiple existing systems and data sources, and to gain actionable insight into manufacturing improvement opportunities at the plant or enterprise level. The Informance offering is very mature and comes with over 700 out-of-the box analytics and dashboards to help manufacturers to quickly derive value. With capabilities in both the business in manufacturing side, Epicor also helps its customers to understand the business / financial impact of manufacturing metrics in real-time.

Epicor has a strong sales, consulting and project delivery team for its solutions, but it does lack an integration partner delivery network, therefore this is an area that we expect to see as a future business development focus.

In discussions with Epicor executives, it is clear that their team is very focused on helping their customers to be successful with the lowest possible overhead software solution. This is an interesting perspective that we don't often see coming from the ERP supplier community. Epicor's MOM solutions work either standalone or integrated with the Epicor ERP offerings, and they have a proven installed base of solutions that are independent of their ERP offerings. They are also providing, and investing in improving the out-of-the-box integration between their MOM and ERP offerings.

In our analysis, customers in the Automotive, Beverage, Consumer Packaged Goods, Food, Metals, Packaging and Pharmaceuticals industries should consider the full range of Epicor's MOM software offerings. The Informance EMI offering is a good fit across an even broader set of manufacturing industries.

There are many different acquired products and technologies in the Epicor portfolio, and they have been investing in out-of-the-box integration between their ERP and EMI offerings to speed the time to value for their customers. In the future, we would like to see Epicor invest in a common technology platform that fully meets LNS Research's vision of a next generation, MOM integration and collaboration platform, and modular 'apps.'

With the existing technology offering, Epicor's stated time to solution implementation value and ROI is already impressive.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Epicor at a Glance

<http://www.epicor.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Government / Public Sector</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Oil &amp; Gas</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Publishing</li> <li>• Semiconductor</li> </ul>	<ul style="list-style-type: none"> <li>• Automotive</li> <li>• Beverage</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Metals</li> <li>• Packaging</li> <li>• Pharmaceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Chemicals</li> <li>• Industrial Equipment</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• SPC / SQC</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Industrial Energy Mgmt.</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. / Production Execution</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• SPC / SQC</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Industrial Energy Mgmt.</li> <li>• Mfg. Production Execution</li> </ul>	<ul style="list-style-type: none"> <li>• Real-Time Production Visualization</li> <li>• Automation / Control System Integration</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> </ul>	<ul style="list-style-type: none"> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• Java / J2EE</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• ISA-99</li> <li>• OAGIS</li> <li>• OpenO&amp;M</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• Step</li> <li>• CAx</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> <li>• Oracle Fusion</li> <li>• IBM Websphere</li> <li>• TIBCO</li> </ul>	<ul style="list-style-type: none"> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> <li>• SAAS</li> <li>• Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> </ul>	
Partner Strategy	<ul style="list-style-type: none"> <li>• 1 Certified Development Partner</li> <li>• Epicor does most customer implementations</li> </ul>		
Time to Solution Value		<ul style="list-style-type: none"> <li>• Avg. Implementation: 3-6 Months</li> <li>• Fastest Repeat Implementation: &lt;3 Months</li> <li>• Avg. ROI: 3-6 Months</li> </ul>	

### *GE Intelligent Platforms*

Based out of Charlottesville, VA, with offices worldwide, the GE Intelligent Platforms division of General Electric covers both industrial automation and industrial software markets.

GE is a household name brand and corporation - known for its many successful industrial, commercial and financial ventures, along with its co-founding over 130 years ago, by famous inventor, Thomas Edison. Over recent years, the GE Intelligent Platforms division was formed to deliver hardware and software technology platforms to industry with a strong focus on selling through OEM providers that can extend market and solutions reach. In addition, GE does provide automation and software solutions to end users, in addition to the division filling an important market need for solutions providers that require proven, stable, integrated platforms to build upon.

This guide covers GE's Proficy brand of industrial software offerings, which includes: HMI / SCADA, MES, data management and analytics software, real-time operational intelligence, and business process management.

The Proficy portfolio has grown and evolved over the past decades through a combination of acquisitions, developments and integrations. We feel that GE has done a good job of bringing their significant installed base of GE Cimplicity and Intellution iFix users along their journey towards newer integration platforms that openly connect to legacy and modern offerings from GE and others.

We also found their industrial Services Oriented Architecture (SOA) approach to be consistent with LNS Research's vision of a next generation, MOM integration and collaboration platform that can span from connecting from the plant floor to the ERP suite. Proficy can be viewed a global manufacturing operations management platform and set of applications that contains a common workflow, data model, and analytics engine to connect manufacturing with the extended value chain and orchestrate enterprise business processes.

GE is leveraging their comprehensive Proficy portfolio, along with a new partnership with PTC for integration

with engineering / PLM software. The combination of these capabilities was recently announced as Proficy for Discrete Manufacturing. According to GE, this solution fully digitizes design and manufacturing processes, provides real-time connectivity, operational visibility, and standardization – in particular, for the Industrial Equipment, Aerospace, Energy, Oil & Gas, and Medical Devices industries.

We see GE's participation in PTC's PartnerAdvantage program as a positive step. With all of the acquisition and partnering activities surrounding the combination of PLM and real-time manufacturing operations systems, we look forward to monitoring the continued progress of digital manufacturing by GE, and the market in general.

GE Intelligent Platforms also has a long history of providing Proficy Plant Applications for a number of process and hybrid industries, including Pulp & Paper, Food, Beverage, Mining, and Utilities. To better serve these industries, a number of pre-configured applications of Proficy, known as Accelerators, have been created to speed the time to value for targeted applications. Examples of Accelerators include: Packaging Line OEE, Manufacturing Energy Management, Weighing Operations, and Production Efficiency.

GE has a strong understanding of manufacturing processes and what is required to deliver enterprise class software platforms, as they use GE Intelligent Platform offerings to support many of their own internal manufacturing operations.

We see a lot of messaging and proof points coming out of GE Corporate and GE Intelligent Platforms on the accelerating, interconnected world and the future potential coming from the 'internet of things.' We hope to see GE accelerate their cloud-based / SAAS offerings into the market in support of these trends.

We also believe that the manufacturing marketplace is becoming increasingly aware of the positive potential benefits of connecting, collaborating, sharing and mining real-time information, and this should serve GE's marketing efforts well.



# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## GE Intelligent Platforms at a Glance

<http://www.proficysoftware.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Beverage</li> <li>• Food</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Pharmaceuticals</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Industrial Equipment</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Industrial Energy Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System</li> </ul>	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. Production Execution</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Employee / Labor Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<p>Integration</p> <ul style="list-style-type: none"> <li>• Integration &amp; Collaboration Platform</li> </ul>		
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> </ul>
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• ISA-99</li> <li>• OAGIS</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> <li>• Oracle Fusion</li> <li>• IBM Websphere</li> <li>• TIBCO</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• ISA-99</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> <li>• SAAS</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• SAAS</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud Based</li> </ul>
Partner Strategy	<ul style="list-style-type: none"> <li>• Manufacturing Equipment and Solutions OEMs</li> <li>• 15 Certified Consulting &amp; Delivery Partners</li> <li>• Supplement GE global resources with smaller, local Systems Integrators</li> </ul>		
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. Implementation: 6 Months-1 Year</li> <li>• Avg. ROI: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>• Fastest Repeat Implementation: &lt;3 Months</li> </ul>	

### *Honeywell Process Solutions*

Based in Houston, TX, and with offices worldwide, Honeywell Process Solutions is the process automation, software and solutions division of Honeywell International. In manufacturing markets, the Honeywell brand is well known for integrated distributed control systems (DCS), safety systems, instrumentation, along with life-cycle services that provide turnkey industry solutions. Honeywell is well respected for their domain expertise in the Chemicals, Metals, Oil & Gas, Paper/Lumber/Timber, and Pharmaceuticals industries.

Over the last few decades, Honeywell Process Solutions has also been building and acquiring advanced software solutions for the process manufacturing industries. Notable acquisitions over this period have included Bonner & Moore, Matrikon, OPTIVISION, Profimatics, and WAM Systems.

Honeywell's solution approach is to address customer's business problems through an outcome-based consulting approach that supports a combination of improved process design, process history and analytics, operations excellence, production management and enterprise collaboration. The goals of their advanced software solutions are to enable users to make faster and smarter decisions to improve safety, reliability, efficiency and sustainability.

For this MOM guide, we evaluated their supply chain, production and operations solutions – all of which are leveraging the Intuition technology engine, coming from their 2010 acquisition of Matrikon. In discussions with Honeywell executives, they indicated that this acquisition added significant technology and expertise in the applications space between control systems and business systems (ERP).

On the technology side, the Matrikon OPC capabilities significantly improved Honeywell's open system and connectivity capabilities. On the expertise side, Matrikon added new capabilities for MOM consulting and engineering. The Honeywell Process Systems advanced solutions team grew to approximately 2,000 people strong as a result.

The Intuition technology engine provides a set of application platform services that include connectivity,

workflow, social collaboration, data collection and analytics. Intuition works in conjunction with, and extends the capabilities of Microsoft SharePoint and Web Services. These process solution extensions include plant modeling, real-time visualization, navigation and Web parts to create user-specified information mash ups.

In 2011, Honeywell added a Manufacturing Execution System (MES) foundation and collaboration capability on top of the Intuition platform – named MES-F. The offering was further enhanced in 2012 and includes the concept of an open MES 'app' store. We look forward to following the evolution and success of this unique approach to market for the industrial space. We also find this approach interesting - coming from a turnkey industry solutions provider.

Honeywell Process Solutions' supply chain solutions are designed to enable clients to get a broad view of production and distribution networks, optimize the balance of supply and demand, and to plan and schedule production both tactically and strategically.

According to Honeywell, their production solutions help clients to improve production accuracy, control costs, and to increase customer satisfaction. And their operations solutions help ensure regulatory compliance, and assist with asset, operations & energy improvements.

We see Honeywell as a reputable supplier to the process industries and one that should be considered as a viable, open MOM solution provider. Honeywell takes a turnkey customer solutions approach to their clients and the market. Therefore, they are not focused on developing a third party solution provider network.

LNS Research looks forward to watching Honeywell further build out the Intuition technology platform with additional MOM platform services and modular 'apps' into the future. Future areas of investment that were discussed with Honeywell executives also included additional support of mobile applications, and additional quality management, operations intelligence, and workflow capabilities.

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

### Honeywell Process Solutions at a Glance

<https://www.honeywellprocess.com/en-US/explore/products/advanced-applications/pages/default.aspx>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Chemicals</li> <li>• Metals</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Chemicals</li> <li>• Metals</li> <li>• Oil &amp; Gas</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Mining</li> <li>• Utilities</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Mfg. / Operations Intelligence</li> <li>• Industrial Energy Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Advanced Control &amp; Optimization</li> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Industrial Energy Mgmt.</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. Production Execution</li> <li>• Advanced Control &amp; Optimization</li> <li>• Batch Mgmt.</li> </ul>	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• Quality Process Mgmt.</li> <li>• Mfg. / Operations Intelligence</li> <li>• Mobile Operations</li> <li>• Integration &amp; Collaboration Platform</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• Europe</li> <li>• APAC</li> </ul>	<ul style="list-style-type: none"> <li>• South &amp; Central America</li> <li>• APAC</li> <li>• Africa</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• Middle East</li> <li>• AZ / NZ</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• Java / J2EE</li> </ul>
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• ISA-99</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> <li>• Oracle Fusion</li> <li>• IBM Websphere</li> <li>• TIBCO</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• ISA-99</li> <li>• OPC Classic</li> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• OPC UA</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> </ul>
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> <li>• SAAS</li> <li>• Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> </ul>
Partner Strategy	<ul style="list-style-type: none"> <li>• No Certified Consulting &amp; Delivery Partners</li> <li>• Honeywell provides turkey solutions for their focus industries</li> </ul>		
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. Implementation: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>• Fastest Repeat Implementation: &lt;3 Months</li> <li>• Avg. ROI: &lt;3 Months</li> </ul>	

### **iBASEt**

Based out of Foothill Ranch, CA, and with a European office in France, iBASEt has been a provider of high-tech software solutions and services since 1986. iBASEt currently has two divisions. The first is the iBASEt Federal division that provides information technology support to defense and government customers, leveraging a highly-specialized staff. And the second is iBASEt's Solumina division which develops and supports their MOM software suite - Solumina.

iBASEt describes Solumina as operations process management software that streamlines and integrates functions across the product lifecycle from engineering to the supplier network, production and aftermarket services. Solumina's MOM software capabilities include MES, along with Maintenance, Repair and Overhaul (MRO), Supplier Quality Management, Manufacturing Quality Management, Tooling Management, and integration capabilities for plant floor, ERP and PLM.

These software solutions have been developed to meet the demanding requirements of complex, discrete industries - including Aerospace & Defense, Nuclear, Industrial Equipment, Electronics and Medical Devices. Major Aerospace & Defense customers, like United Space Alliance, Lockheed Martin, BAE Systems, General Dynamics, BWX Technologies, Northrop Grumman and United Technologies – are all users of Solumina.

As part of iBASEt's ongoing efforts to better support the life-cycle of paperless shop floor execution, they recently announced a new Solumina integration package for PTC's PLM offerings – specifically, PTC Creo and PTC Windchill. This package supports closed-loop integration of engineering change processes between PTC's PLM and iBASEt's Solumina, which should greatly

simplify and streamline the management of design changes between customer's design departments and their production operations. According to iBASEt, the PLM-to-execution integration includes drag-and-drop authoring that leverages 3D design models and master data coming from the PTC software. iBASEt also supports PLM integrations with Dassault Systemes ENOVIA/DELMIA and Siemens Teamcenter Manufacturing.

LNS Research sees this type of PLM integration becoming more and more of an expected requirement for MOM software solutions that are targeted at complex discrete manufacturing industries. This capability is becoming critical to assisting manufacturers to launch products to market quickly, while maintaining high levels of productivity, quality and compliance.

The upcoming Solumina G8 release, which is being previewed at the company's user group meeting, includes a new manufacturing intelligence module that enables users to mine data to reveal new insights into areas for continuous improvement.

The company has some key relationships with integration partners, which helps with technology rollouts. Certified consulting and delivery partners include: ATS Global, CSC and L&T Infotech. Its strategic integration partners include: Dassault Systemes, Deltek, IBM, Kaba, PTC and SAP.

We see iBASEt as having strong capabilities in both flow-based and cell-based, discrete manufacturing processes. Their offerings are a tailored fit to the industries and customers that they currently serve. We also see as one of the company's challenges, the need to gain greater visibility in the marketplace, in order to meet their future industry expansion aspirations.

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

### *iBASEt at a Glance*

<http://www.solumina.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Telecommunications</li> <li>• Other – Shipbuilding &amp; Nuclear</li> </ul>	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Medical Devices</li> <li>• Other – Shipbuilding &amp; Nuclear</li> </ul>	<ul style="list-style-type: none"> <li>• High Technology</li> <li>• Industrial Equipment</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Mfg. / Operations Intelligence</li> <li>• Mfg. Production Execution</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Automation / Control System Integration</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• Europe</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>• Java / J2EE</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• OAGIS</li> <li>• Web Services</li> </ul>	<ul style="list-style-type: none"> <li>• OAGIS</li> <li>• Web Services</li> </ul>	

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• IBM Websphere</li> </ul>	<ul style="list-style-type: none"> <li>• IBM Websphere</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	
Partner Strategy	<ul style="list-style-type: none"> <li>• OEM Partner: Deltek</li> <li>• Certified Consulting &amp; Delivery Partners: ATS Global, CSC, L&amp;T Infotech</li> <li>• Strategic Integration Partners: Dassault Systemes, Deltek, IBM, Kaba, PTC, SAP</li> </ul>		
Time to Solution Value		<ul style="list-style-type: none"> <li>• Avg. Implementation: 3-6 Months</li> <li>• Fastest Repeat Implementation: &lt;3 Months</li> <li>• Avg. ROI: 3-6 Months</li> </ul>	



### *Invensys*

Invensys plc is a technology and engineering company with corporate headquarters in London, UK, and with its Software business unit based out of Lake Forest, CA. Invensys, along with its dedicated software distribution and support network, does business in over 180 countries in the world – across a wide variety of manufacturing industries. The primary software brands represented in this MOM guide are Avantis, SimSci and Wonderware. In addition to Software, other Invensys business units are Industrial Automation (Foxboro and Triconex brands), Energy Controls and Appliance.

As of August, 2013, French multi-national electricity distribution and automation management company Schneider Electric struck what appears to be a final deal (pending government anti-trust processes) to acquire Invensys. The deal is expected to close in the last quarter of this year and we see this as an overall positive move that will add scale, continued technology investment and create new portfolio synergies with little overlap.

Like many other conglomerates, the Invensys MOM software portfolio has grown over the past decades through a series of acquisitions, developments and the use of integration and collaboration platform technology. Invensys has been a long time partner - committed to the Microsoft technology stack.

The Avantis brand of Invensys software brings enterprise asset management, asset performance, and mobile workforce management offerings. The SimSci brand of advanced software solutions includes plant process design, simulation, operator training, advanced control, and business / process optimization. The Wonderware brand is known for HMI / SCADA software, along with a comprehensive suite of information management solutions – including MES and EMI software.

The Wonderware brand recently announced an acquisition to further bolster support for an

increasingly mobile manufacturing workforce. The SmartGlance mobile information management offering was acquired in June 2013. SmartGlance brings mobile industrial data reporting that delivers access to information, analytics, and KPIs across manufacturing enterprises on smart phones and tablets.

Invensys has integrated many of its offerings across its automation and MOM software portfolio using the ArchestrA System Platform. Over the past decade, Invensys has made significant investments in solving the integration and application development and management challenges of its customers by developing this object-based integration and development software platform. Workflow and business process management capabilities were added into this platform a few years back with the acquisition of Skelta software.

As an early implementer of open MOM integration and collaboration platform technology, we hope to see the current Invensys applications evolve along with the platform, while simultaneously creating a bi-directional bridge with the Schneider Electric StruxtureWare software offerings after the Schneider acquisition is completed. Over time, we would like to see the best elements of ArchestrA and StruxtureWare technologies merged into a next-generation platform that preserves the important product / application interfaces, while driving the next level of productivity and ease of use for customers.

Invensys serves a broad range of industries, but with its strongest domain expertise in Process and Hybrid manufacturing operations. The company has built good relationships with capable integration partners, which helps with customer rollouts of MOM solutions. Its partners, among others, include Atos Origin, Callisto Integration, SNC Lavalin, and WIPRO.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Invensys at a Glance

<http://iom.invensys.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Education</li> <li>• Food</li> <li>• Government / Public Sector</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Publishing</li> <li>• Semiconductor</li> <li>• Telecommunications</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Industrial Equipment</li> <li>• Pharmaceuticals</li> <li>• Oil &amp; Gas</li> </ul>	<ul style="list-style-type: none"> <li>• Smart Cities</li> <li>• Solar Power</li> <li>• Water &amp; Wastewater</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Industrial Energy Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production</li> </ul>	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Production Asset Mgmt.</li> <li>• Plant Data Historization</li> <li>• Mfg. / Operations Intelligence</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. Production Execution</li> <li>• Advanced Control &amp; Optimization</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile Operations / HTML5</li> <li>• PLM and/or Plant Design Integration</li> </ul>

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	<ul style="list-style-type: none"> <li>Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Advanced Control &amp; Optimization</li> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>		
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• South &amp; Central America</li> <li>• APAC</li> <li>• Middle East</li> </ul>
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• ISA-99</li> <li>• OAGIS</li> <li>• OpenO&amp;M</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> <li>• Oracle Fusion</li> <li>• IBM Websphere</li> <li>• TIBCO</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• ISA-99</li> <li>• OAGIS</li> <li>• OpenO&amp;M</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>• Hosted</li> <li>• SAAS</li> <li>• Cloud Based</li> </ul>
Partner Strategy		<ul style="list-style-type: none"> <li>• 25 Certified Consulting &amp; Delivery Partners</li> <li>• Includes: Atos Origin, Callisto Integration, SNC Lavalin, WIPRO</li> </ul>	

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

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Time to Solution Value	<ul style="list-style-type: none"><li>• Avg. Implementation: 9 Months-1 Year</li><li>• Fastest Repeat Implementation: 3-6 Months</li><li>• Avg. ROI: 6 Months-1 Year</li></ul>		
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### *iTAC Software*

Based out of Germany, and with offices in France, USA and China, iTAC Software AG develops, integrates and maintains its cloud-based MES for discrete manufacturing enterprises around the globe. Their offering is called iTAC.MES Suite.

This suite has been designed for use across multiple manufacturing disciplines, in order to help clients optimize product quality, while increasing production from their existing assets.

The functional services provided by modules of the software suite are: Traceability, Quality Management, Production Management, Production Planning, and Material Logistics. As a standard product, the iTAC.MES.Suite is able to synchronize across ERP systems and plant floor machines from many different manufacturers and vintages.

In addition, the software is built upon an extensible middleware software platform, called ARTES (Advanced Reliable Technology for Enterprise Systems), which enables additional add-on services and modules.

In order to satisfy company-specific IT requirements, iTAC offers the iTAC.Enterprise.Framework. This framework is a cloud-based, Java EE development platform on which the development tools, data repository and revision control functions are operated on an iTAC private cloud. The iTAC ARTES, MES, plus other third-party Java EE library components can all be combined to facilitate the creation of customized solutions.

iTAC currently supports Oracle GlassFish and IBM WebSphere application servers. Instead of building out their own server farms, iTAC has taken a pragmatic approach. They have partnered with Fujitsu for providing a secure cloud infrastructure and servers for their customers.

iTAC originated their offerings by setting out to meet the stringent requirements of the German Automotive and OEM industry. From there, the company has been working closely with customers, industry experts, project leaders and production staff to expand their solutions into the High Technology / Electronics, Industrial Equipment and Medical Devices industries. They also see a fit and have future aspirations in the Aerospace & Defense industry.

iTAC also works with other software partners to fill functional areas of their offering, and by integrating these third party offerings into the ARTES platform.

In discussions with iTAC executives, business expansion in the USA is accelerating, and they also see future business expansion with projects in the Middle East, Africa, Australia and New Zealand. We see one of iTAC's challenges as being able to focus and respond with expert staff to the 'best fit' project opportunities - without spreading themselves too thinly.

iTAC takes pride in the high-availability and quality of their software solutions. The company has been awarded the new ISO certification DIN ISO 9001:2008 by DQS GmbH, the German Association for Certification of Management Systems.

The company's sweet spot appears to be mid-sized German companies, however they do business with global companies of all sizes. iTAC Software has a few formal relationships with third party consulting and integration partners, and we would suggest that more development in this area is required in order to fully realize their industry and geographic expansion plans.

We see iTAC being focused on technology excellence, and ensuring that they can layer their solutions into customer's existing systems and IT architectures. Their modern, cloud-based SAAS approach can flexibly work on combinations of private and public clouds.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## iTAC Software at a Glance

<http://www.itacsoftware.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> </ul>	<ul style="list-style-type: none"> <li>• Automotive</li> <li>• High Technology</li> <li>• Industrial Equipment</li> <li>• Medical Devices</li> </ul>	<ul style="list-style-type: none"> <li>• Aerospace and Defense</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Mfg. Production Execution</li> <li>• SPC / SQC</li> <li>• Production Asset Mgmt.</li> <li>• Overall Equipment Effectiveness</li> <li>• Enterprise Application Integration</li> </ul>	<ul style="list-style-type: none"> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Employee / Labor Mgmt.</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> </ul>	<ul style="list-style-type: none"> <li>• Europe</li> <li>• APAC</li> </ul>	<ul style="list-style-type: none"> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

Technology Development Platforms	<ul style="list-style-type: none"> <li>• Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>• Java / J2EE</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA 95 / B2MML</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• Microsoft .NET</li> <li>• IBM Websphere</li> <li>• TIBCO</li> </ul>	<ul style="list-style-type: none"> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• IBM Websphere</li> </ul>	<ul style="list-style-type: none"> <li>• Oracle Fusion Middleware</li> </ul>
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> <li>• SAAS</li> <li>• Cloud</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> <li>• SAAS</li> <li>• Cloud</li> </ul>	
Partner Strategy	<ul style="list-style-type: none"> <li>• Technology Partners to Round Out Offering</li> <li>• 3 Certified Consulting &amp; Delivery Partners</li> <li>• Includes: Cogiscan, Mentor</li> </ul>		
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. ROI: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>• Avg. Implementation: 3-6 Months</li> <li>• Fastest Repeat Implementation: &lt;3 Months</li> </ul>	

### *Lighthouse Systems*

Based out of Crawley, UK, with offices in the USA and Singapore, Lighthouse Systems Ltd. has been delivering real-time manufacturing information software since 2004. Lighthouse Systems' MES product is called Shopfloor-Online. It is configurable software package that helps manufacturing companies achieve measurable improvements in efficiency, output, compliance, quality, and customer satisfaction.

In discussions with Lighthouse Systems executives, Shopfloor-Online enables manufacturers to transform their cultures from one where operational and investment decisions are based on intuition and experience, to one where they are based on accurate and consistent real-time information. Shopfloor-Online supports the drive for lean manufacturing by highlighting areas of waste. It can also help enforce business processes and support operators in following proper business procedures.

Shopfloor-Online provides a Web-based user interface, and contains 25 different selectable software modules that provide specific functionality in the following areas: Production Operations, Inventory Operations, Quality Operations, Maintenance Operations, and Engineering Operations. Users can select just the modules required to suit their manufacturing business issues, and can readily add more software functionality over time - without disrupting existing production operations.

Lighthouse Systems is proud of their very high client retention rate, in addition to the expandability and ease of configurability of the software. Through the Shopfloor-Online User Group, clients contribute to the future developments that will further increase their operations agility.

Industry strengths are in Automotive, Beverage, Consumer Packaged Goods, Food, Packaging and High Technology. The company is also rapidly expanding into adjacent regulated industries such as Aerospace & Defense, Medical Devices and Pharmaceuticals.

To support this regulated industry expansion and their focus on quality and client satisfaction, they have been focused on driving internal software development excellence, and have recently achieved two key milestones. The first is gaining the ISO 9001:2008 Certification for its software development operations. The second is achieving Microsoft Partner Gold status as an Independent Software Vendor (ISV).

Lighthouse Systems is starting to build up relationships with integration partners, and we see this partner development as being one of the keys to supporting continued growth and success of the company.

Other future areas of investment that we discussed with Lighthouse Systems were in the areas of providing their SAAS, as well as enhancements to their software in the areas of document management, proactive maintenance management and industrial energy management.

We would suggest that Lighthouse Systems should expand gradually into adjacent industry market spaces to ensure they can maximize their efforts and resources.

It is good to see that the company appears to be very focused on customer satisfaction and delivering software that is readily usable by the different plant floor and management roles across manufacturing enterprises.



## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

### Lighthouse Systems at a Glance

<http://www.lighthousesystems.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Semiconductor</li> <li>• Telecommunications</li> </ul>	<ul style="list-style-type: none"> <li>• Automotive</li> <li>• Beverage</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• High Technology</li> <li>• Packaging</li> </ul>	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Medical Devices</li> <li>• Oil &amp; Gas</li> <li>• Pharmaceuticals</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Production Asset Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Overall Equipment Effectiveness</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Mfg. Production Execution</li> </ul>	<ul style="list-style-type: none"> <li>• Document Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Industrial Energy Mgmt.</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> </ul>	

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• Europe</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• Europe</li> <li>• AZ / NZ</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• OPC Classic</li> <li>• ODBC</li> <li>• Web Services</li> <li>• Microsoft .NET</li> <li>• Oracle Fusion</li> <li>• IBM Websphere</li> </ul>	<ul style="list-style-type: none"> <li>• OPC Classic</li> <li>• ODBC</li> <li>• Web Services</li> <li>• Microsoft .NET</li> <li>• Oracle Fusion</li> <li>• IBM Websphere</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-88</li> <li>• OPC UA</li> </ul>
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> <li>• Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>• SAAS</li> </ul>
Partner Strategy	<ul style="list-style-type: none"> <li>• 3 Certified Consulting &amp; Delivery Partners</li> </ul>		
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. Implementation: 6 Months-1 Year</li> <li>• Fastest Repeat Implementation: 3-6 Months</li> </ul>	<ul style="list-style-type: none"> <li>• Avg. ROI: 3-6 Months</li> </ul>	

### Oracle

Headquartered out of Redwood Shores, CA, Oracle is one of the largest IT companies in the world, with offerings across a wide portfolio of engineered computer hardware and enterprise software applications. For the purposes of this report, LNS Research evaluated Oracle on its ability to deliver integrated MOM software functionalities across the complete product life-cycle and end-customer value chain by including the following software solutions: Oracle E-Business Suite for Manufacturing, Oracle Mobile Supply Chain Applications, Oracle E-Records, Oracle MES, Oracle Management Operations Center, and Oracle Value Chain Execution.

Together with the vendor's popular database technology, Edge Servers and ERP offerings, Oracle aims to help improve productivity, ensure compliance and align the value chains of manufacturing enterprises. Oracle can additionally deliver data management and automation capabilities for product development and quality with its Agile PLM and Document Management software, although these offerings are not explicitly covered here.

The Oracle E-Business Suite for Manufacturing enables configure-to-order, project manufacturing, outsourcing, and quality management capabilities for both discrete and process manufacturing. This set of software applications can either be used in a pre-integrated fashion with Oracle MES, or can be integrated with other third party MES software using standard ISA-95 and Web Services conventions. Oracle MES appears to be very flexible in its ability to readily handle virtually any mix of manufacturing modes – high volume / low mix, low volume / high mix, flow manufacturing, lot / serial controlled, etc.

Oracle Management Operations Center includes new extensions to Oracle's Endeca BI acquisition, and can provide both manufacturing and business analytics / insights. These include not only manufacturing performance metrics, but also the dynamic cost

impacts of production and supply chain operations - as they occur.

Oracle Mobile Supply Chain Applications support mobile receiving, manufacturing, inventory and shipping activities, along with assisting with quality operations. We see the industry demanding more mobile enabled solutions, even for in-plant applications, and are encouraged by Oracle's emerging strength in this area.

Oracle Value Chain Execution capabilities cover both planning and execution elements including: Transportation Management, Warehouse Management, Global Trade Management, Landed Cost Management, and Logistics. These offerings come pre-integrated Oracle Mobile Supply Chain Management and ERP offerings.

Oracle E-Records provides a configurable framework for secure capture, storage, inquiry, and printing of electronic records and electronic signatures in compliance with government regulations, such as FDA 21 CFR Part 11.

For large companies that have already invested in the Oracle technology stack, LNS Research believes that investing in Oracle's MOM capabilities are a natural extension. However, LNS Research also believes that some may find that they prefer a comprehensive MOM software solution that is not so tightly bound to the Oracle ERP and database applications. For some manufacturing users, the autonomy and flexibility of a loosely coupled MOM system may be more appropriate for their business needs.

Oracle's breadth and depth of manufacturing software capabilities surprised us a bit, as it appears they have been quietly acquiring, integrating and building strong functionality to meet the needs of today's globally competitive manufacturing landscape.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Oracle at a Glance

<http://www.oracle.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Education</li> <li>• Food</li> <li>• Government / Public Sector</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Publishing</li> <li>• Semiconductor</li> <li>• Telecommunications</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Automotive</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Pharmaceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Oil &amp; Gas</li> <li>• Utilities</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Batch Mgmt.</li> <li>• PLM and/or Plant Design</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Mfg. / Operations Intelligence</li> <li>• Mfg. Production Execution</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile Operations</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>Integration <ul style="list-style-type: none"> <li>Enterprise Application Integration</li> <li>Automation / Control System Integration</li> <li>Integration &amp; Collaboration Platform</li> </ul> </li> </ul>		
Company Sizes Served	<ul style="list-style-type: none"> <li>Small (0-\$50M Revenue)</li> <li>Medium (\$50M-\$1B Revenue)</li> <li>Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>North America</li> <li>South &amp; Central America</li> <li>Europe</li> <li>APAC</li> <li>Middle East</li> <li>Africa</li> <li>AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>North America</li> <li>South &amp; Central America</li> <li>Europe</li> <li>APAC</li> <li>Middle East</li> <li>Africa</li> <li>AZ / NZ</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>Java / J2EE</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>ISA-95 / B2MML</li> <li>ISA-88</li> <li>OAGIS</li> <li>OPC Classic</li> <li>OPC UA</li> <li>ODBC</li> <li>Web Services</li> <li>Microsoft .NET</li> <li>Oracle Fusion</li> <li>IBM Websphere</li> <li>TIBCO</li> </ul>	<ul style="list-style-type: none"> <li>OAGIS</li> <li>ODBC</li> <li>Web Services</li> <li>Oracle Fusion</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>On-Premise</li> <li>Hosted</li> <li>SAAS</li> <li>Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>On-Premise</li> <li>Hosted</li> <li>SAAS</li> <li>Cloud Based</li> </ul>	
Partner Strategy		<ul style="list-style-type: none"> <li>100 Certified Consulting &amp; Delivery Partners</li> <li>Includes: Accenture, Cap Gemini, CSC, Deloitte, TCS, WIPRO</li> </ul>	
Time to Solution Value	<ul style="list-style-type: none"> <li>Avg. Implementation: 6 Months-1 Year</li> <li>Fastest Repeat Implementation: 3-6 Months</li> <li>Avg. ROI: 6 Months-1 Year</li> </ul>		

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

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### *Parsec*

Headquartered in Anaheim, CA, Parsec Automation Inc. (Parsec) is a privately-owned company serving customers in more than 80 countries around the globe. Founded in 1987, Parsec's manufacturing software beginnings were grounded in providing performance management solutions that openly work across a diverse set of existing systems and data – deployable without disrupting existing production operations. Over the last decade, Parsec's offerings have evolved into a comprehensive MOM suite known as TrakSYS.

The TrakSYS offering has steadily incorporated new functionality, and as an example, the most recent version 8 R2 incorporates support of big data analytics across manufacturing enterprises. Their TrakSYS software provides an integrated application that is designed to help manufacturers improve asset utilization and efficiency, increase capacity of the current capital equipment, reduce production costs, decrease lead time, and improve profitability. Functionally, TrakSYS assists users with their management of information, workflow, quality, materials, production execution, and regulatory compliance.

As part of the evaluation for this guide, Parsec also provided us with a detailed demonstration of TrakSYS which covered pretty much the entire range of MOM functionality – including visualization, historian, reporting, OEE, Batch, MES functionality, electronic records, asset management, planning and scheduling, labor management, shipping and receiving, workflow and documentation, and manufacturing intelligence. We were impressed with the scope, integration, and ease of use of the software.

In discussions with Parsec executives, software usability and experience is a key focus of ongoing investments. And with the emergence of greater use of

mobile devices in manufacturing, this is another area of future investment for Parsec.

It was interesting to uncover that most of Parsec's TrakSYS customers are large global enterprises, even though the software certainly scales to fit with small and medium manufacturing enterprises. In fact, Parsec offers 'lite' versions of TrakSYS specifically for simpler applications.

Key industry strengths are in Beverage, Consumer Packaged Goods, Food, Industrial Equipment, Packaging and Pharmaceuticals. Given the support of features required for regulated industries, Parsec sees Pharmaceuticals as an area of additional focus for TrakSYS.

The company continues to gear itself up to support customers with mission-critical requirements, by offering 24/7 technical support and by expanding its global partner network. They have 32 certified consulting & delivery partners in their network – including integration firms such as Actemium, Altran, Applied Control Engineering, ASM Soft, Autoware, CGI, HSI Informática Industrial Ltda., and Sysmaker.

One of the challenges we see for Parsec is the need to continue to manage global growth and to attract additional skilled partners. We do believe that the company has a strong understanding of manufacturing processes and what it takes to deliver enterprise class software platforms.

Even though Parsec does not separate the TrakSYS platform software from the application modules - based on the level of integration across the MOM functions, it appears that Parsec has done a good job in architecting their software in a way that is consistent with LNS Research's vision of next-generation, integration and collaboration platforms.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Parsec at a Glance

<http://www.parsec-corp.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Education</li> <li>• Food</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Publishing</li> <li>• Semiconductor</li> <li>• Telecommunications</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Beverage</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Industrial Equipment</li> <li>• Packaging</li> <li>• Pharmaceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Industrial Equipment</li> <li>• Pharmaceuticals</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Industrial Energy Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> </ul>	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. Production Execution</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Mobile Operations</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>		
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Africa</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• CAx</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> <li>• Oracle Fusion</li> <li>• IBM Websphere</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• OPC Classic</li> <li>• ODBC</li> <li>• Web Services</li> <li>• Microsoft .NET</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> <li>• SAAS</li> <li>• Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	
Partner Strategy		<ul style="list-style-type: none"> <li>• 32 Certified Consulting &amp; Delivery Partners</li> <li>• Includes: Actemium, Altran, Applied Control Engineering, ASM Soft, Autoware, CGI, HSI Informática Industrial Ltda., Sysmaker</li> </ul>	
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. Implementation: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>• Fastest Repeat Implementation: &lt;3 Months</li> <li>• Avg. ROI: &lt;3 Months</li> </ul>	



### *Plex Systems*

Based out of Troy, MI, and with offices in California and Germany, Plex Systems has been a pioneer in providing manufacturing focused ERP solutions using a cloud-based SAAS approach since 2001. Growing up in the Automotive and discrete manufacturing industry, the founders of Plex Systems applied their knowledge of engineering and software development to create native cloud manufacturing ERP – built from the plant floor up instead of from the accounting department down.

Using this cloud / SAAS approach, customers of Plex Systems are unburdened from maintaining servers, systems or software updates, and can focus on using and setting up the software, often on a self-service basis. In addition, Plex customers indicate that the time to value for manufacturing ERP deployments are simplified and shortened. New software features are continually being added to the product, based on customer and market feedback, and these new capabilities are rapidly made available to all customers using the Plex Manufacturing Cloud offerings.

In addition to the expected ERP functionality, Plex Systems' offering also covers Supply Chain Management, Customer Relationship Management, Business Intelligence, MES, and Quality Management functionalities. Customers can choose from these functions, and all of these modules share pertinent data across a customer's instance in the cloud. In addition, customers with multiple manufacturing sites can determine which data and applications are to be shared and which are to be locked to a given manufacturing location.

When evaluating the MES functionality of their offering, we were pleased to see the comprehensive coverage and how the management of manufacturing processes is at the center of the entire suite.

On the Business Intelligence side, Plex Systems released new capabilities in this area late 2012, with their IntelliPlex offering. IntelliPlex enables customers to perform analytics and visualizations across multiple manufacturing sites, and to correlate metrics across both business and manufacturing data. It works in 'near real-time,' with cloud report server updates occurring every four hours – fast enough for business

decision making, however not a tool intended for 'minute to minute' plant floor decision making.

In discussions with Plex Systems executives, they are investing in a number of strategic product roadmap areas: higher speed data warehousing, SQL and external database integration – along with support of data and visualization mashups, optimization of screen navigation, and enhancements to support better mobile device visualization. In addition, they continue to invest in Food & Beverage industry requirements, and real-time quality procedure compliance.

Based on discussions with Plex customers, as well as from attendance at their user conference, one of the most notable differences about Plex Systems is the passion, success, and conviction that their customers have. It is clear that their customers have fully bought into the multi-tenant cloud model, and the customer driven development approach.

When discussing digital manufacturing and the need to assist customers with faster time to market, Plex Systems pointed to the integration of design information into their offerings, working in conjunction with PLM integration partners Qbuild and Actify.

A key strength for Plex Systems is the ability for customers to configure out-of-the-box, enterprise business to manufacturing processes that includes: design engineering, supplier relationships / EDI, planning and scheduling, manufacturing execution and performance management, manufacturing tooling management, quality, warehousing, shipping and ongoing customer relationship management.

Plex Systems targets small and medium discrete manufacturers. They are also finding that their solution is a good fit in hybrid industries that are open to adopting rapid deployment, cloud-based solutions, therefore they are making good inroads with Food & Beverage companies.

When asked about manufacturing customers that had a different ERP backbone, Plex Systems indicated that some customers work with them with multi-tier ERP, but after evaluation, most customers adopt their entire ERP and manufacturing solution.

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

### Plex Systems at a Glance

<http://www.plex.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• High Technology</li> <li>• Industrial Equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Automotive</li> <li>• Beverage</li> <li>• Food</li> <li>• Industrial Equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Management</li> <li>• Overall Equipment Effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>• Plant Data Historization</li> <li>• Mfg. / Operations Intelligence</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> </ul>
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Large (&gt;\$1B Revenue)</li> </ul>
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> </ul>	<ul style="list-style-type: none"> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>AZ / NZ</li> </ul>		
Technology Development Platforms	<ul style="list-style-type: none"> <li>Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>ODBC</li> <li>Web Services</li> <li>Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>ODBC</li> <li>Web Services</li> <li>Microsoft .NET</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>Cloud Based</li> <li>SAAS</li> </ul>	<ul style="list-style-type: none"> <li>Cloud Based</li> <li>SAAS</li> </ul>	
Partner Strategy	<ul style="list-style-type: none"> <li>12 Certified Services and Technology Partners to Assist with Implementation Services, Business Process Services and Unique Technical Requirements</li> </ul>		
Time to Solution Value	<ul style="list-style-type: none"> <li>Avg. Implementation: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>Fastest Repeat Implementation: &lt;3 Months</li> <li>Avg. ROI: &lt;3 Months</li> </ul>	

### Rockwell Automation

A longtime player in the industrial automation and information market space, Rockwell Automation is headquartered in Milwaukee, WI and has offices and a large distribution and system integration network to serve customers around the globe. The Rockwell Automation FactoryTalk information software portfolio enables manufacturers to better visualize, or gain insight into production operations, analyze sources of inefficiencies, poor quality, or downtime, and provide standardized workflows and procedures to optimize production operations.

MOM software offerings include FactoryTalk ProductionCentre as the core MES, and FactoryTalk Batch for managing recipes using ISA 88 standards, along with a comprehensive set of FactoryTalk EMI offerings – Historian, Metrics, Transaction Manager and VantagePoint EMI.

All of the information software from Rockwell Automation, as well as their control offerings, utilize the common FactoryTalk Services Platform to unify communications and security, and to simplify integration efforts. FactoryTalk also supports open industry standards to support integration with other systems and applications.

Rockwell Software Industry Operations Management Suites have been created for the Automotive, Consumer Packaged Goods and Life Sciences industries. These industry suites contain best industry practices that have evolved over years of customer project experience in both information and automation, and the MOM functionality covers the applicable facets of required by that market. In discussions with Rockwell Automation executives, this is an area of continued refinement and investment, with the goals of making it easier and faster for customers to get performance and quality management.

Other future directions that we discussed included providing more software consumption options such as

Cloud / SAAS, and enhancements to mobile visualization and mobile operations.

The Rockwell Automation software portfolio has accelerated through partnerships – like OSISoft for Historian, Microsoft for extending SharePoint into the EMI portfolio, and Cisco for integrated network and systems management. In addition, Rockwell Automation has made significant acquisitions over the past decades in the MOM space, with more recent highlights being Incuity for open EMI, data modeling and analytics, and Pavilion Technologies for advanced modeling and optimization. The latest Pavilion8 model predictive control software helps reduce process variability and inefficiency, improves product consistency, and allows operations to push to the limits of process design constraints.

Rockwell Automation has done a good job of integrating their information and automation portfolio, and we would like to see their continued investment in extending their software services platform into the next-generation, MOM integration and collaboration platform vision that LNS Research has been proposing to the marketplace.

Rockwell Automation has built up one of the largest sets of MOM solution partners, with 300 Recognized Systems Integration Partners with regional & industry expertise on Rockwell Information Software products. 41 partners have been audited to ensure that they have provided proven results on MOM projects using Rockwell Software.

Rockwell Automation has a huge installed base of industrial automation customers which provides a large opportunity for MOM software solutions, and at this year's RSTechED event, it was clear that Rockwell is working diligently to educate automation engineers on the need to also become savvy information engineers – with the goal of accelerating their business performance and ultimately their careers. This also provided a strong indication as to the importance of MOM software in the future of Rockwell Automation.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Rockwell Automation at a Glance

<http://www.rockwellautomation.com/rockwellautomation/products-technologies/information-software/overview.page?>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Education</li> <li>• Food</li> <li>• Government / Public Sector</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Packaging</li> <li>• Paper / Lumber / Timber</li> <li>• Pharmaceuticals</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Automotive</li> <li>• Beverage</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Packaging</li> <li>• Pharmaceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Mining</li> <li>• Oil &amp; Gas</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Industrial Energy Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. / Production Execution</li> <li>• Advanced Process Control &amp; Optimization</li> <li>• Batch Mgmt.</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Global Traceability &amp; Genealogy</li> <li>• Production Asset Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. / Production Execution</li> <li>• Advanced Process Control &amp; Optimization</li> <li>• Batch Mgmt.</li> <li>• Automation / Control System Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Quality Process Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Mobile Operations</li> <li>• PLM and/or Plant Design Integration</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• Java / J2EE</li> </ul>	<ul style="list-style-type: none"> <li>• Microsoft .NET</li> <li>• Java / J2EE</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• ISA-99</li> <li>• OAGIS</li> <li>• OPC Classic</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> <li>• Microsoft .NET</li> <li>• Oracle Fusion</li> <li>• IBM Websphere</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• OPC Classic</li> <li>• ODBC</li> <li>• Web Services</li> <li>• Microsoft .NET</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Hosted</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud Based</li> <li>• SAAS</li> </ul>
Partner Strategy		<ul style="list-style-type: none"> <li>• 300 Recognized SI Partners with regional &amp; industry expertise on Rockwell Information Software products</li> <li>• 41 Audited solution partners for MOM</li> </ul>	
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. Implementation: 6 Months-1 Year</li> <li>• Avg. ROI: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>• Fastest Repeat Implementation: &lt;3 Months</li> </ul>	

### SAP

A longtime provider in the Enterprise Application space, SAP was founded in 1972 and has its worldwide headquarters in Walldorf, Germany. Although known for its large ERP presence and versatile business configurability, the company has built up one of the largest ecosystems of manufacturing technology and solution partners, along with developing, acquiring and integrating MOM software solutions for a wide range of manufacturing industries. One of SAP's key strengths is their ability to create customer value by supporting end-to-end, enterprise business to manufacturing processes across the entire product life-cycle that includes: design engineering, supplier relationships, planning and scheduling, manufacturing execution and performance management, warehousing, shipping and ongoing customer relationship management.

This broad array of capabilities is delivered through SAP's Business Suite, which includes ERP, Manufacturing, PLM and Supply Chain. These solution areas are supported by a five pillar strategy of driving excellence in Applications, Analytics, Mobility, Database / Technology, and Cloud.

Specific applications that directly address the MOM level of the manufacturing enterprise include SAP MII (Manufacturing Intelligence and Integration), SAP ME (Manufacturing Execution) and Plant Connectivity (using OPC standards and custom plant device interfaces). All of these applications are further supported through numerous ERP modules including PP (Production Planning), MM (Materials Management), PM (Plant Maintenance) and QM (Quality Management).

Key acquisitions over the past five years have accelerated SAP's ability to improve and deliver

enhanced solutions in the areas of mobility, 3D visualization, business analytics, manufacturing execution systems, business process management, sustainability, and supply chain. In addition, SAP's high speed, in-memory database technology (HANA) is unlocking interesting new capabilities to perform real-time analytics and decision support across huge data sets.

SAP targets small, medium and large industrial businesses involved in both process and discrete manufacturing. SAP's interoperability allows companies to manage operational and financial systems under one business software platform. The software uses a service-oriented architecture (SAP Netweaver), and the manufacturing application interoperability is enhanced by the SAP MII and Plant Connectivity offerings. Its openness appeals to many businesses looking for strong ERP and MOM coverage in addition to integration with existing in-house systems.

While SAP's built-in business process and master data integration will appeal to many manufacturing users, some may find that they prefer a MOM software solution that is not so tightly bound to the ERP. For some manufacturing users, the autonomy and flexibility of a loosely coupled MOM system may be more appropriate for their business needs.

Manufacturers who have already invested in other elements of SAP's Business Suite should give close consideration of using SAP ME, MII and Plant Connectivity for their MOM needs. Additionally, SAP MII is a 'Swiss army knife' that is well positioned to add value to virtually any existing heterogeneous application environment.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## SAP at a Glance

<http://www.sap.com>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Chemicals</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Government / Public Sector</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Mining</li> <li>• Oil &amp; Gas</li> <li>• Packaging</li> <li>• Paper/Lumber/Timber</li> <li>• Pharmaceuticals</li> <li>• Semiconductor</li> <li>• Telecommunications</li> <li>• Utilities</li> </ul>	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Chemicals</li> <li>• Consumer Packaged Goods</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> </ul>	
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Industrial Energy Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• Mfg. / Operations Intelligence</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Mobile Operations</li> <li>• Mfg. Production Execution</li> <li>• Enterprise Application Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Proactive Maintenance Mgmt.</li> <li>• Mobile Operations</li> <li>• Real-Time Production Visualization</li> </ul>



## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>• Batch Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>		
Company Sizes Served	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>• Small (0-\$50M Revenue)</li> <li>• Medium (\$50M-\$1B Revenue)</li> <li>• Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>• North America</li> <li>• South &amp; Central America</li> <li>• Europe</li> <li>• APAC</li> <li>• Middle East</li> <li>• Africa</li> <li>• AZ / NZ</li> </ul>	
Technology Development Platforms	<ul style="list-style-type: none"> <li>• Java J2EE</li> <li>• Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>• Java J2EE</li> <li>• Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• ISA-88</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> </ul>	<ul style="list-style-type: none"> <li>• ISA-95 / B2MML</li> <li>• OPC Classic</li> <li>• OPC UA</li> <li>• ODBC</li> <li>• Web Services</li> <li>• SAP MII</li> </ul>	<ul style="list-style-type: none"> <li>• OAGIS</li> <li>• OpenO&amp;M</li> </ul>
Technology Delivery Model	<ul style="list-style-type: none"> <li>• On-Premise</li> <li>• Cloud Based</li> </ul>	<ul style="list-style-type: none"> <li>• On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud Based</li> </ul>
Partner Strategy		<ul style="list-style-type: none"> <li>• &gt;100 Certified Consulting, Delivery &amp; Technology Partners</li> <li>• Includes: Atos Origin, Cap Gemini, Fujitsu, HCL, HP, Itelligence, WIPRO</li> </ul>	
Time to Solution Value	<ul style="list-style-type: none"> <li>• Avg. ROI: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>• Avg. Implementation: 3-6 Months</li> <li>• Fastest Repeat Implementation: &lt;3 Months</li> </ul>	

### Siemens

Siemens is a more than 165 year old German-based, global electronics and electrical engineering company, operating in the industry, energy, healthcare, and infrastructure and cities sectors. Siemens is one of the largest vendors in the industrial / manufacturing market space. The company is well known for their prowess in Industrial Automation, and they also have capable offerings for PLM software, MES, and EMI. Based on recent acquisitions and developments, Siemens is also extending its solutions into Enterprise Quality Management Software (EQMS).

As a diversified, volume manufacturer itself, Siemens has a good understanding of the needs of engineering, manufacturing and IT executives, allowing it to offer a broad set of functionalities to many industries. The company's MOM software strengths lie with the combination of their PLM and MES solutions. Siemens PLM offerings fit well with large discrete manufacturing firms, especially in the Automotive, Aerospace & Defense, and Industrial Equipment industries, Siemens is taking a closed-loop approach to the complete product and production lifecycle.

Its PLM functionality is strong in the areas of design for quality, manufacturing, service and warranty. The Siemens Tecnomatix offering provides plant design and optimization software for discrete industries. The Siemens Teamcenter and NX offerings manage design and quality workflows and processes, as well as computer aided design and manufacturing information. Siemens has been leading the industry with digital manufacturing concepts via the integration of their PLM and MES offerings, with the goal of shortening time to market and reducing costs and errors for its customers.

Siemens' MES software, SIMATIC IT, with its pre-configured library approach to implementation and expansion into new industries, is a viable choice for process and hybrid industries, and increasingly - the discrete industries. SIMATIC IT delivers solutions across manufacturing R&D and production, and the offering has built-in EMI functionality and strong manufacturing operations workflow.

Other relevant MOM software from Siemens includes WinCC HMI / visualization software, and COMOS life-cycle plant engineering and asset management software.

In discussions with Siemens executives, they continue to invest in expanding their SIMATIC IT solution coverage for the Pharmaceuticals industry by leveraging knowledge and other capabilities coming from their 2009 acquisition of Elan Software.

The other major investment area that we discussed were the expansion of the SIMATIC IT integration platform to grow from MES to full MOM, while increasing the open connectivity to other applications and improving the user interfaces.

We see Siemens' future investments in their open integration and collaboration platform integration as key to speeding solution time to value, and for limiting the amount of customization required for customer solutions.

The acquisition of Preactor earlier this year also brings advanced planning and scheduling (APS) capabilities to Siemens' MOM portfolio. We can see customers benefiting from better coordination and optimization between long-term ERP scheduling and short-term production realities, using Preactor software. Even though Preactor works as a standalone offering, we will also be looking for future product integration between SIMATIC IT and Preactor APS.

Siemens has built up an impressive set of MOM solution partners, with 80 certified consulting and delivery partners covering different geographies and industries. Their partner list includes: Actemium, Ardan Control-Tech, ASKOM, Atos Origin, ATS International, Bayer Technology Services, Brock Solutions, HYLASOFT, and Logica. And Siemens supports their partner network with a common value framework and set of customer specifications to help ensure project success.

# Solution Selection Guide: Manufacturing Operations Management (MOM) Software

## Siemens at a Glance

<http://siemens.com/industry>

	Total Coverage Area	Areas of Strength	Emerging Strength
Industries Served	<ul style="list-style-type: none"> <li>• Aerospace &amp; Defense</li> <li>• Automotive</li> <li>• Beverage</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Government / Public Sector</li> <li>• High Technology</li> <li>• Medical Devices</li> <li>• Industrial Equipment</li> <li>• Metals</li> <li>• Mining</li> <li>• Packaging</li> <li>• Pharmaceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Automotive</li> <li>• Beverage</li> <li>• Consumer Durable Goods</li> <li>• Consumer Packaged Goods</li> <li>• Food</li> <li>• Industrial Equipment</li> <li>• Pharmaceuticals</li> </ul>	<ul style="list-style-type: none"> <li>• Pharmaceuticals</li> </ul>
MOM Functionality	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Quality Process Mgmt.</li> <li>• SPC / SQC</li> <li>• Document Mgmt.</li> <li>• Production Asset Mgmt.</li> <li>• Proactive Maintenance Mgmt.</li> <li>• Plant Data Historization</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Employee / Labor Mgmt.</li> <li>• Industrial Energy Mgmt.</li> <li>• Receiving, Warehousing &amp; Shipping</li> <li>• Real-Time Production Visualization</li> <li>• Mobile Operations</li> <li>• Mfg. / Production Execution</li> <li>• Advanced Control &amp; Optimization</li> <li>• Batch Mgmt.</li> <li>• Laboratory Information Mgmt.</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> </ul>	<ul style="list-style-type: none"> <li>• Mfg. Process Mgmt. / Workflow</li> <li>• Global Traceability &amp; Genealogy</li> <li>• Overall Equipment Effectiveness</li> <li>• Mfg. / Operations Intelligence</li> <li>• Real-Time Production Visualization</li> <li>• Mfg. Production Execution</li> <li>• PLM and/or Plant Design Integration</li> <li>• Enterprise Application Integration</li> <li>• Automation / Control System Integration</li> <li>• Integration &amp; Collaboration Platform</li> </ul>	<ul style="list-style-type: none"> <li>• Production Planning, Scheduling &amp; Dispatching</li> <li>• WIP Inventory Mgmt. &amp; Optimization</li> <li>• Integration &amp; Collaboration Platform</li> </ul>

## Solution Selection Guide: Manufacturing Operations Management (MOM) Software

	<ul style="list-style-type: none"> <li>Automation / Control System Integration</li> <li>Integration &amp; Collaboration Platform</li> </ul>		
Company Sizes Served	<ul style="list-style-type: none"> <li>Small (0-\$50M Revenue)</li> <li>Medium (\$50M-\$1B Revenue)</li> <li>Large (&gt;\$1B Revenue)</li> </ul>	<ul style="list-style-type: none"> <li>Medium (\$50M-\$1B Revenue)</li> <li>Large (&gt;\$1B Revenue)</li> </ul>	
Geographies Served	<ul style="list-style-type: none"> <li>North America</li> <li>South &amp; Central America</li> <li>Europe</li> <li>Middle East</li> <li>Africa</li> <li>AZ / NZ</li> </ul>	<ul style="list-style-type: none"> <li>North America</li> <li>Europe</li> </ul>	<ul style="list-style-type: none"> <li>APAC</li> </ul>
Technology Development Platforms	<ul style="list-style-type: none"> <li>Microsoft .NET</li> </ul>	<ul style="list-style-type: none"> <li>Microsoft .NET</li> </ul>	
Integration Standards Supported	<ul style="list-style-type: none"> <li>ISA-95 / B2MML</li> <li>ISA-88</li> <li>ISA-99</li> <li>OAGIS</li> <li>OpenO&amp;M</li> <li>OPC Classic</li> <li>Web Services</li> <li>CAX</li> <li>SAP MII</li> <li>Microsoft .NET</li> <li>Oracle Fusion</li> </ul>	<ul style="list-style-type: none"> <li>ISA-95 / B2MML</li> <li>ISA-88</li> <li>ISA-99</li> <li>OAGIS</li> <li>OpenO&amp;M</li> <li>OPC Classic</li> <li>Web Services</li> <li>CAX</li> <li>SAP MII</li> <li>Microsoft .NET</li> <li>Oracle Fusion</li> </ul>	
Technology Delivery Model	<ul style="list-style-type: none"> <li>On-Premise</li> </ul>	<ul style="list-style-type: none"> <li>On-Premise</li> </ul>	
Partner Strategy		<ul style="list-style-type: none"> <li>80 Certified Consulting &amp; Delivery Partners</li> <li>Includes: Actemium, Ardan Control-Tech, ASKOM, Atos Origin, ATS International, Bayer Technology Services, Brock Solutions, HYL A SOFT, Logica</li> </ul>	
Time to Solution Value	<ul style="list-style-type: none"> <li>Avg. Implementation: 6 Months-1 Year</li> <li>Avg. ROI: 6 Months-1 Year</li> </ul>	<ul style="list-style-type: none"> <li>Fastest Repeat Implementation: 3-6 Months</li> </ul>	

### Concluding Thoughts

Manufacturing Operations Management software plays an important role in supporting continuous improvements in manufacturing business efficiency, cost savings, consistency, safety and agility across the extended value chain. MOM software can create significant additional value from people and existing enterprise and industrial automation system investments by enabling streamlined end-to-end business to manufacturing processes and providing valuable real-time data in support of rapid and empowered decision making across operations.

The information in this guide is intended to serve as a critical resource for executives at the starting point in their journey toward selecting a MOM solution. By breaking down vendors by industries served, functionalities, technology delivery platforms, and so on, executives can create a shortlist of potential solutions that meet their needs and expectations.

Selecting and implementing a comprehensive MOM solution can be a laborious and complex process, however, market leading companies have greatly benefited from the power of integrated MOM solutions. LNS Research would be happy to participate in the entire process of selecting a vendor, including confirming which vendors should be on the shortlist, managing the RFP process, and making the final decision. More specifically, LNS Research can help in the following ways:

- Prepare draft RFP document, review, and finalize with client
- Send RFP to approximately 3-5 top vendors and manage all subsequent communications
- Collect all responses and prepare summary report for client executives
- Analyze results in conjunction with client and provide recommendation for choices 1, 2, and 3
- Act as advisor on any subsequent proof of concept projects

For more information on how LNS Research can facilitate the solution selection process or for any questions or comments, please contact us by email at [info@lnsresearch.com](mailto:info@lnsresearch.com).

*Executives interested in a MOM implementation may also be interested in the following LNS Research reports:*

[Manufacturing Operations Management Best Practices Guide](#)

[The Evolution of Manufacturing Software Platforms: Past, Present, and Future](#)

[Aligning Business & Manufacturing Goals for Greater Profitability](#)

#### *About LNS RESEARCH*

*LNS Research provides advisory and benchmarking services to help Line-of-Business, IT, and Industrial Automation executives make critical business and operational decisions. LNS research focuses on providing insights into the key business processes, metrics, and technologies adopted in industrial operations. LNS Research Solution Selection Guides are specifically designed to help executives quickly assess a particular software segment and build a framework for identifying which vendors best meet the business need.*

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