MarketScope for Manufacturing Operations Management, 2007

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The manufacturing operations software marketplace is becoming a key competitive field for specialists and megavendors. We compare the major players.
The Manufacturing Execution System Market Continues to Evolve Toward Manufacturing Operations Management

In 2006, we continued to use the term manufacturing execution system (MES) because this remained the best-understood term for plant information technology sitting above the control layer. Now is the time to drop the MES moniker and all the baggage it has collected during the years and focus on the much more business-oriented view of the world that manufacturing operations management (MOM) comprises. Almost all successful vendors in the MES space are continuing to move toward an integrated set of MOM applications, with a growing emphasis on business process integration, as opposed to tactical integration to ERP and other enterprise applications. Likewise, users are beginning to consider business process management (BPM) in their project scopes.

The original focus of MES was to fill a functional gap in a plant's "execution" of production in light of the preponderance of planning, material, inventory management and accounting tools at the disposal of the enterprise. Plant managers and their staff required a way to create, control and monitor standard workflows in manufacturing facilities. Basic MES functions included dispatching production orders to the appropriate workstations or automated process units, delivering work instructions that aided production personnel in completing jobs successfully, and monitoring their progress and completion. In regulated environments, MESs also provided traceability of individual actions taken by operators, as well as the ability to track and trace material use against serial or lot numbers. However, the current generation of MOMs represents a broader set of functions, incorporating plant-focused business intelligence, real-time production visibility, plant operations portals, quality and process improvement facilities, links to supply chain planning, manufacturing process planning, and ERP nodes in a networked operations model.

In 2006, we made a number of Strategic Planning Assumptions (predictions) about the market. Here, we take a look at these predictions to illustrate how the market continues to evolve. We predicted: "By 2007, manufacturing CIOs will begin to transition the planning, business justification and sourcing of production technology assets by using a more business-focused, yet plant-centric, manufacturing operations management paradigm, supplanting a plant-owned manufacturing execution system model." This prediction was more correct than we expected.

Gartner inquiries regarding MES and MOM for single-plant applications have almost dropped to nil. All our clients are looking at the business implications and benefits of global standardization at the MOM layer and starting to see it for what it should be — the bottom layer of the business-IT hierarchy rather than the top layer of the control hierarchy.

We also made a number of predictions that would happen by 2008. We predicted that more than 50% of clients would use their control system or business system vendors for their MOM solutions, and indeed, we are already seeing great evidence of this through continued consolidation of the market and the tendency toward enterprisewide deals. Large corporations making enterprise MOM software decisions tend to put global software vendors on their shortlists. The competition between these two groupings — traditional large control companies such as Siemens, Rockwell Automation and ABB and the global business software vendors, including SAP and Oracle — is still taking shape and is discussed in this research.

One trend that we also predicted for discrete manufacturers — that a new MOM approach will emerge, enabling 20% of discrete manufacturers to base their enterprise architectures on a solution with product life cycle management (PLM) as the central enterprise application with
manufacturing execution functions integrated into it — has become one of the hottest topics in the manufacturing design and operations space. With the acquisition of UGS by Siemens, as well as Agile by Oracle, we see a focused consolidation toward integration among design and manufacturing systems. This will drive the benefits of using PLM as an enterprisewide solution and is already starting to deliver benefits through manufacturing process management.

What Makes a Good MOM Supplier?

The move toward MOM from traditional MES will continue apace during the next two to three years. We expect to see increased dominance by the large players in the market. However, making a choice for a MOM supplier is not becoming easier. While the large software companies continue to increase their investments and refine their delivery models, the smaller independent companies maintain a relentless focus on specific markets and a deep knowledge of them. We expect that some markets, such as mining, metals, refining and, to a certain extent, life sciences will continue to be served by the specialist providers to those markets.

Indeed, the prediction we made last year — “Through 2008, where manufacturing operations management applications are provided by enterprise resource planning or process control suppliers, solutions delivered by partners or other third parties will still be deployed in more than 60% of those instances to make up for functional shortfalls” — is likely to become a pervasive model in several manufacturing markets.

Choosing a MOM supplier from the big software vendors is very difficult. Most manufacturers will be able to rule out all but one or two ERP vendors, because the advantages of going with a vendor that is not the current ERP system makes little sense given the current immaturity of ERP vendors' MOM solutions. Choosing an ERP vendor as MOM supplier can bring some real benefits — single supplier, easier integration and a software partner network built up by the bigger vendors. The downside is usually that the plant-floor-level applications are not as rich as those from companies more accustomed to working in the plant. Some vendors (for example, SAP) try to get round this by having tight relationships with traditional plant-floor MOM vendors, while others (such as Oracle) are trying to build ever richer applications through acquisition and internal development. Both are viable routes, and clients need to decide whether the benefits mentioned outweigh the lighter functionality. This route is certainly viable for companies without very complex manufacturing processes, though probably not worth considering today at the complex end of discrete manufacturing (for example, aerospace, automotive and OEM or process manufacturing, such as refining and polymers).

The choice of traditional control companies over specialists is rather different; both try to deliver the same levels of functionality in a rather different way. Due to their wide market penetration in their traditional controls markets, the control companies need to support a wide range of industries with their MOM solutions. Although they are successfully doing this, it is also clear that the libraries and configuration needed to fit the product to a particular application take considerable effort and money. It is in the vendor's interest to find a strong partner (hopefully a faithful client) with whom to build the required industry libraries.

One of the potential advantages of the independents over the large control companies is project engineering. Many of them have dedicated service delivery teams trained in MOM and with strong capability in system integration at the IT level. Particularly in the discrete industries, the control companies often use partners to implement their control systems. While this model works well in controls, Gartner has seen a number of MOM partners that have not had sufficient IT and ERP experience successfully to integrate the plant systems with the business. Clients should take as much care about selecting their delivery partners as they should about the software vendors — Gartner research shows that a good implementation consultant is one of the biggest contributors to project success.
Service-Oriented Architectures in MOM Are Emerging

For many years, the cost of integration into business systems was one of the major reasons why MES projects were not seen as delivering good value. Service-oriented architectures (SOAs) offer opportunities to reduce the complexity of interfaces and ensure that the cost of upgrading is not prohibitive due to interface changes. The majority of MOM vendors are now offering their solutions in a way that is Web-service-enabled. They usually are based on .NET or Java Platform, Enterprise Edition (Java EE) technology.

All MOM projects must define points of integration or points of influence with systems such as ERP, CRM, PLM and business intelligence (BI). These systems are also moving toward SOA-based architectures, and so when defining a MOM project, it is essential to design the architecture to fit with the overall corporate SOA strategy. Many users of SAP or Oracle will base their SOA strategies on NetWeaver or Fusion, but even customers of those platforms may use hybrid solutions with corporate SOA backbones and portals based on a third-party SOA infrastructure from, for example, IBM or Microsoft. However, it is important to realize that mixing and matching MOM components from different vendors in an SOA-based solution is not going to be a practical option during the next two to three years.

MOM Deployments Are Valuable but Still Risky

MOM deployments present several risks, including:

- **Business risk** — The risk of a provider discontinuing operations or being acquired by an owner that changes technology or business direction
- **Purchasing risk** — The risk of buying more or less scope than is required
- **Project risk** — The risk of costly overruns due to excessive customization services, a poor implementation partner or system integration work
- **Maintenance risk** — The risk of upgrading or replacing applications earlier than expected and the risks associated with organizational change needed to leverage the increased visibility offered

User organizations can mitigate these risks by spending time and money early in project cycles — independent of software providers — to build clear executive sponsorship, define critical business drivers and project success factors, ensure the solution will fit into the corporate IT architecture, and present detailed functional requirements from the business case. The business case for MOM solutions must address the enterprise-level business processes that will benefit from the MOM solution — developing a business case purely on plant performance will not drive the maximum return on investment (ROI). We further recommend detailed product assessment/project scope and methodology reviews of shortlisted software and service providers. Finally, we recommend subjecting the eventual bidders and their proposals to the complete IT governance model and purchasing methodologies of the CIO organization. Too often, these projects and IT assets are implemented outside the "radar" of the IT organization, compounding risks and minimizing the business impact of the MOM system.

MOM Functionality Varies Greatly Across Manufacturing Sectors

Distinct solutions — driven by unique production factors, commercial requirements and regulatory compliance mandates — are required for the pharmaceutical, automotive, consumer goods, semiconductor, electronics, aerospace and defense, chemical, paper, and metals industries. Most MOM software providers can demonstrate competence in as many as three industrial subsectors. Therefore, buyers must be discriminating early in vendor evaluations and quickly eliminate
candidates that do not have a track record in their specific sectors. Determine whether a provider has a healthy installed base that is comparable in operations to the company's most-specific industrial classification. For example, do not assess providers according to broad, generic classifications such as "life sciences." Instead, verify competence in delivering MOM systems for "pharmaceutical finished goods." Because not all MES suppliers are appropriate for every manufacturer, in 2006 we published a guide to MES suppliers and their markets (see "Not All MES Suppliers Are Appropriate for Every Manufacturer"). This will be updated when necessary.

A Special Note About Life Sciences

Several MOM vendors claim to work in the life science vertical market. Gartner defines life sciences as everything to do with human pharmaceuticals, biotech, medical and dental. Each of these sectors has very different requirements in manufacturing execution. Clients in these sectors should be sure to look very closely not only at the suppliers mentioned here but also at smaller specialty vendors that might work in one single sector such as pharmaceutical finishing or medical devices. More than any other sector, consultants with real industry experience are a prerequisite to success due to the onerous validation requirements set by drug regulation authorities such as the U.S. Food and Drug Administration (FDA), European Medicines Agency and Japanese Pharmaceuticals and Medical Devices Agency (PMDA).

The Target Audience for MOM Is Changing

Often, the initial driver for MOM applications originates from the plant floor as an attempt to methodically trigger production, distribute work instructions and enforce production workflows. However, MOM is changing from a production-focused application to a critical part of enterprise business process integration. This brings with it the need for an expansion in the people involved in MOM deployment. From the earliest architectural discussions to final decision for a vendor and program implementation and rollout, the scope of personnel involved in a MOM project is wider than ever. A critical success factor for manufacturers wishing to deploy standard MOM solutions across the enterprise is the cooperation between IT and plant departments. The complexity of such relationships will lengthen decision cycles and put more emphasis on early project stages, but these costs are necessary if the potential value is to be achieved. Care must be taken not to subvert the original, mission-critical aspects of MOM projects as a larger project scope is undertaken. Project compartmentalization, prioritization and step-by-step implementation are recommended to ensure that production-critical execution and enterprise value can be delivered together.

Product Maturity Is Variable

Although the MES market has been around for more than 20 years, there are many immature MOM products on the market. This has been caused by consolidation and by the entry into the market of the bigger players that have had to build a complete suite of solutions. Initially, there were considerable problems for the bigger vendors in bringing their portfolios of acquisitions into a single suite of solutions. However, we have seen great progress during the last year and can confidently say that the majority of the control companies are on the right track with clearly defined architectures based on SOA technology. Within these and the business system providers, the depth of functionality and the complexity of the solution architecture need to be analyzed before progressing.

Buyers should build their MOM functional specifications and data models independent of broad-scope portfolio vendors. Before adding a vendor to a shortlist, confirm three client references that are satisfied with the depth of the application, the ease of the project implementation and the quality of the overall user experience in similar sectors.
Favor Providers That Can Deliver Short Time to Benefit and Transparent, Incremental Value

Executive sponsorship and ongoing political support are required to make MOM projects successful. A technology provider that can help devise a technology/project plan that expedites the delivery of application value and enables the company to build a base of support within the plant and the enterprise is a strategic ally; be sure to factor this into the vendor selection criteria. Examples of prolonged, "big bang" MES projects that failed to deliver tangible or measurable benefits are numerous. Vendors that have studied these failed projects and built their product architecture and technology foundations to support a more expedient deployment scenario should be identified and favored in vendor assessments. An ally will be able to help develop an implementation plan that can show fast ROI and tangible benefits early in a project, even if full deployment over multiple plants might take years.

STRATEGIC PLANNING ASSUMPTIONS

By 2008, more than 50% of manufacturers deploying manufacturing operations management solutions will look to their enterprise resource planning or process control suppliers to serve as the backbones of these applications.

By 2008, a new MOM approach will emerge, enabling 20% of discrete manufacturers to base their enterprise architectures on solutions with PLM as the central enterprise application with manufacturing execution functions integrated into it.

Through 2008, where MOM applications are provided by ERP or process control suppliers, solutions delivered by partners or other third parties will still be deployed in more than 60% of those instances to make up for functional shortfalls.

MARKETSCOPE

MOM means different things to different people and markets. Most MOM solutions have grown up in one of three very different markets: large-scale continuous processing such as petroleum and chemicals; discrete manufacturing such as automobile and aerospace; or pharmaceuticals. The requirements of these markets have driven the strengths and focus of most traditional MES vendors, and the crossover between them has, until now, been limited. However, several vendors have built modern solutions that they claim can be configured across all markets, and the special requirements of regulated industries have attracted a large number of players to add the necessary functionality to support pharmaceutical and medical device manufacturing capabilities. Although the generic solutions can be configured for most applications, we believe that the key driver for success in any specific market is not simply the underlying technology, but rather the domain expertise of the vendor and the system integrator.

As MES evolves into MOM, manufacturers that are looking to build integrated enterprisewide solutions that combine plant-floor information within ERP business processes should examine the advantages of having an SOA-based solution at the MOM and ERP levels. As ERP systems have matured, the need to deliver more value from them drives the integration with manufacturers' plants. The change to SOA will make, for the first time, this integration cost-effective rather than a black hole for IT funds.

MOM solutions will enable manufacturers to make much better use of their manufacturing data at the enterprise level. To achieve this, manufacturers need to bring together the disparate interests of corporate IT and manufacturing IT functions and people. SOA-based solutions, manufacturing intelligence portals and the ability to integrate business processes across the enterprise will not
be sufficient without suitable organizational change to ensure that the potential value can be achieved. Gartner expects that MOM will deliver increasing value to manufacturers during the next two to three years. As ERP and other enterprise software vendors (such as dealing with PLM, CRM and SCM) continue to mature their SOA-based systems, the integration of business processes with manufacturing information will deliver ever more sophisticated and valuable solutions.

The MOM market continued to mature in 2007, with continued consolidation as well as a move away from a plant-centric focus to the MOM model. The consolidation has reached a point where we now see two quite distinct sets of vendors in the market: the large multibillion-dollar conglomerates with a MOM presence and small specialist companies that concentrate on only a few specific markets and, in some cases, specialized functionality. The large companies offer the advantages of global presence, financial stability and, often, large investments in MOM technology, most of which have come from multiple acquisitions of smaller MES vendors. The smaller companies are often private and struggle to make the investments needed to continue to lead in this increasingly sophisticated market, but do often have a sound product base and in-depth knowledge of the needs of their customers. A few independent vendors fall somewhere in the middle and are big enough to have strong development capabilities and the ability to service customers globally.

Because acquisition remains a likely scenario for some of the smaller-scale providers still active in the MOM market, users must factor the possibility of dealing with new owners for application development, maintenance and support. Occasionally, these deals bring users less ongoing business risk for the MOM application under new and more resourceful corporate ownership; but users may also experience some degree of pain if business development, marketing strategy and product directions diverge from the original plans on which their investments were made.

**Market/Market Segment Description**

MESs have long been defined by the ISA (www.isa.org) S95 standard. Indeed, ISA has now changed the moniker to MOM to confirm the expansion of the market into something more than the term MES. All traditional MES vendors claim to cover most or all the S95 standard, even though the low-level details, particularly in terms of communication with outside systems such as ERP, are not fully defined and happily tend to be implemented in a way to satisfy client needs rather than the standard. We believe that the emphasis on S95 will not carry much weight in the future as companies move to a more integrated view of enterprise and manufacturing IT. One key to the move from MES to MOM is to ensure that the vital execution functions of traditional MES are not forgotten during this transformation. These functions enable manufacturers to model, dispatch and enforce production routines in the plant or factory. In discrete manufacturing, this core function specifically includes the ability to issue production orders and work instructions to the appropriate personnel along the defined route. Important ancillary functions include the digital tracking or tracing of materials involved in production, as well as the tracking of works in process and finished goods on the plant floor; the availability and status of machines, equipment, work cells or production lines, as well as the records and analyses of machine/line utilization in production; and the availability and status of labor, as well as the records and analyses of labor utilization in production. In more-continuous manufacturing processes, many of the ancillary functions are the same, but the key execution functions are more focused on dispatching and controlling manufacturing campaigns, measuring and controlling the process variables to ensure product consistency and quality, and providing interfaces to operators to manage the entire plant and process. Other key functions include advanced process control, applications for the movement and storage of large-scale raw materials and finished goods, yield accounting, and mass balancing.
The MOM market is not homogeneous, and within the smaller independent vendors is becoming less so. MOM systems have evolved through several generations of software development and across a broad range of industrial and business management approaches. Although many core production execution functions may appear similar in concept, some packages contain a high degree of industry-specific content, driven by the unique production factors, commercial requirements and regulatory mandates that characterize an industry sector. Other MOM systems can be defined as "toolkits" with a wider range of applicability across sectors, based on a user's investment in "industry templates" or customization services. A third MOM market variant can be aptly described as a production-focused information management facility. While some providers bundle some degree of information management facilities with core production execution functions, others deliver value almost exclusively by modeling, archiving, analyzing and sharing context-sensitive information to operators, production, plant and executive management. This is an important growth area in the MOM market space. Many new (and some not so new) "manufacturing intelligence" vendors focus on this analysis area independent of the rest of MOM solutions. While we have been briefed by a number of these, we are not including them in this research due to the small part of the MOM space they cover. Manufacturing clients with a relatively low level of automation in their production can gain fast ROI from a focused use of these systems from vendors such as Pertinence and CDC Software (with CDC Factory). In this MarketScope iteration, we have included vendors that serve a single industry. We have tagged the ratings for these vendors, noting that the rating applies only to a specific industry segment such as pharmaceuticals, metals or mining. We believe that it is appropriate to include these narrowly focused vendors because they generally offer exceptional "out-of-the-box" functionality for the sectors they serve, which is a key buying criterion for MOM purchasers. The narrower focus does affect the viability of such companies; however, due to the relatively low importance the market places on viability when making MOM purchases while allowing them to focus in all other areas. We have specifically excluded single-industry evaluation of products/vendors focused solely on the semiconductor; these are covered by Gartner's semiconductor research agenda. Vendors whose rating applies only to a single industry segment are:

- Broner Metals Solutions — ferrous metals and aluminum industry only
- Gemcom Software International — mining industry only
- Werum — biopharmaceutical industry only

While other vendors serve a specific segment of manufacturing such as process manufacturing and not discrete, or vice versa, we have rated them based on a multi-industry strategy. It is important to note that a vendor may have a positive or strong positive rating and still be unsuitable for certain market segments or industries. Users should ascertain fitness for use on a case-by-case basis. Vendors with ratings of "promising" may well be the best choice for a given industry or company.

As we have seen, there are many different solutions available, and each of them tends to fit a particular purpose better than others. This leads to another trend that we see in the market — partnerships. ERP and PLM vendors have a strong interest in integrating MOM functionality into their enterprisewide applications. However, it is difficult for one of these vendors to be able to cover all the industries in which it sells its enterprise software. We expect to see a continued growth in partnerships between ERP vendors and the industry-specific MOM vendors. Manufacturers that already have ERP systems should examine these partnerships, current and potential, to see if benefits could accrue.
Inclusion and Exclusion Criteria

The 19 software providers included in this MarketScope met one or more of these criteria for inclusion (see Table 1 and Figure 1):

- The MES software unit, or its parent company, reported revenue of $100 million or more during fiscal 2006.
- The MES software unit was included in our previous MarketScope, and we received inquiries about it.
- The MES software unit was the subject of at least four client inquiries during the past 12 months.

Changed From Last Year

Added:
- Broner Metals Solutions
- Gemcom Software International
- Werum

Dropped:
- Activplant — Although Activplant was included in past MarketScopes, we have not received any inquiries regarding the company during the past 12 months, so it no longer meets the inclusion criteria.
- Brooks Automation — The company was acquired by Applied Materials. However, the products originally considered in this MarketScope as supplied by Applied Materials were exclusive to the semiconductor industry, which have been dropped due to coverage within Gartner’s semiconductor research agenda. The products currently evaluated under the heading of Applied Materials are those that Applied Materials acquired via its acquisition of Brooks Automation.
- UGS — The company was acquired by Siemens and is rated as part of Siemens.

Rating for Overall Market/Market Segment

Overall Market Rating: Promising

If we were analyzing the MES market under the same criteria as 2006, we would probably have upgraded the overall market to "positive" in 2007. We have seen a strong growth in the market, and most vendors seem to be improving their financial positions. More importantly, manufacturers are starting to deploy broader and deeper MES solutions. This is one reason why the MOM market is clearly taking over from the traditional MES market. The promise of easily integrated plant and business systems through an SOA-based enterprisewide system is still some way away. The advent of specialist suppliers in manufacturing intelligence leads to the thought that clients should be able to build their MOM architectures by picking and choosing Web services that suit their needs. We do not believe that this is even close today because semantic integration into ERP and other enterprise business processes is still in its infancy. The difficulty of integrating a single MOM system into the business is hard enough without considering choosing best-of-breed components from multiple vendors. However, the promise of being able to integrate plant-
floor applications specific to a particular industry within the overall MOM/enterprise software environment from another vendor is a compelling one.

One area where the pace of change is slower than we would like is the marketing and selling capabilities of many MOM vendors. As they continue to shift their marketing focus from the plant to the enterprise buying center, they must be more skillful in presenting the benefits and justification of MOM to the corporate sponsors of large-scale software projects. This means having a stronger industry understanding and being able to sell the business benefits to executive management, rather than just the manufacturing benefits to the plant engineer.

We see a continued need for improvement in the delivery channel. Some vendors have strong delivery capability; others depend heavily on system integrators. Both models have merit in certain industry sectors; however, we see a need for ever improving industry understanding by the MOM vendors so that they can ensure that projects are delivered at low cost and high quality, whether by themselves or their partners. The consolidation of the market is surely not yet complete, and it is almost inevitable that such acquisitions cause considerable disruption to customers of the acquired and sometimes the acquiring vendor. However, it is clear that the scope of the MOM market is broadening, and that the opportunities to deliver real value to manufacturers will be seized by vendors with the ambition, products and vision to set them apart from their competitors.

Although the average score of vendors is closer to "positive" than "promising," the MOM market is extremely fragmented, and we have tried to limit the inclusion to those companies that provide a substantial percentage of MOM functionality. Companies that just provide manufacturing intelligence or concentrate on performance measurement in simple industries have not been included. Many of these companies would, if included, get a "caution" or "promising," not because of their capabilities, but rather because they are unlikely in the short term to be a part of a complete MOM solution. Thus, the overall rating of the market, from a manufacturer's and vendor's viewpoint is "promising." For the market to move to "positive," we need to see an increase of enterprise buying and successful rollout, as well as a maturing of solutions from vendors. Fast deployment and proven ROI are key to the future success of the MOM industry.

**Evaluation Criteria**

**Table 1. Evaluation Criteria**

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<th>Evaluation Criteria</th>
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<tr>
<td>Market Understanding</td>
<td>Ability of the technology provider to understand buyers’ needs and translate these needs into products and services. In particular, a clear understanding of the business value of MOM and the ability to position the solutions at the enterprise level as well as in the plant.</td>
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<td>Offering (Product) Strategy</td>
<td>A technology provider's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature set as they map to current and future requirements. Particular emphasis is put on integration capabilities and openness to third-party solutions.</td>
<td>Standard</td>
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<td>Business Model</td>
<td>The soundness and logic of a technology provider's underlying business proposition and how it fits into the wider business processes of its customers.</td>
<td>High</td>
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<td>Product/Service</td>
<td>Core goods and services offered by the technology provider that compete in/serve the defined market. This includes current product capabilities, quality and feature sets as defined in the market definition and detailed in the subcriteria. Technology providers should demonstrate that they are delivering business value through their MOM solutions, rather than a technical solution to a problem.</td>
<td>High</td>
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<td>Overall Viability (Business Unit, Financial, Strategy, Organization)</td>
<td>Viability includes an assessment of the overall organization's financial health, the financial and practical success of the business unit, and the likelihood of the individual business unit to continue to invest in the product, continue offering the product and advancing the state of the art within the organization's portfolio of products.</td>
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<td>Operations</td>
<td>The ability of the organization to meet its goals and delivery commitments to customers. Of primary importance is the ability to deliver MOM projects on time, within budget and to the customer's satisfaction — whether this is done by the technology provider or third-party partners. Other factors include the quality of the organizational structure, including skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis.</td>
<td>Low</td>
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Source: Gartner (December 2007)

### Figure 1. MarketScope for Manufacturing Operations Management, 2007

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<th>RATING</th>
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As of 20 December 2007

Note that three vendors that work in only a single industry have been evaluated against their performance in that industry. These are Werum, Broner Metals Solutions and Gemcom Software International.

Source: Gartner (December 2007)
Vendor Product/Service Analysis

ABB Group

ABB (Zurich, Switzerland; public) is a $24 billion automation and power technology vendor with global operations. Its manufacturing software leverages its control and automation products with generic solutions as part of its System 800xA control architecture, as well as with industry-specific solutions developed within the independent industry groups. ABB has seen the importance of the plant software sector and has now focused more effort on having a single strategy and architecture, but with a strong vertical market focus in its main markets such as pulp and paper, power generation, and metals. Due to the high complexity of the markets in which ABB's control business operates, a key strategy is to have a full-service capability, even to the point of providing outsourcing services, for its large clients that run complex and asset-intensive processes. ABB calls its MOM Collaborative Production Management (CPM) and has created a 200-person team to focus on the integration between business systems and the traditional ABB comfort zone of the plant floor. The move to an SOA-based architecture has started, and ABB offers its own portal; however, the majority of CPM applications are still not implemented as SOA Web services. The conservative nature of many of ABB's clients will probably mean not many will be early adopters of SOA-based enterprise systems and so should not be overly affected. ABB's traditional strength in the pharmaceutical industry, particularly active ingredient manufacturing, is being refocused. We await the results with interest. ABB has made some strong alliances in specific industries with major delivery and software companies such as IBM and SAP. Where these solutions meet the needs of clients, the level of service and integrated solution offered will be advantageous. ABB is back in the MOM world with a serious stab at being a major software player, and the progress made in ABB's key industries deserves a rating raise.

Vendor Rating: Positive

Applied Materials

Applied Materials (Austin, Texas; public; NASDAQ: AMAT) acquired Brooks Automation, and we considered those products from this supplier of hardware, software and services, primarily for semiconductor and semiconductor capital equipment OEMs in this research. Brooks, in the past as a stand-alone company, demonstrated a compelling contemporary vision for MES and MOM as critical components of the real-time manufacturing enterprise. Brooks offered extensive MES functions under the FACTORYworks (acquired through acquisition of FASTech Integration) and Promis brands. Under Applied Materials, we see FACTORYworks as the flagship suite outside of semiconductors. Industries targeted include aerospace and defense, automotive, medical device, electronics (especially data storage and flat-panel display devices), and semiconductor industries. However, we believe business development has been slower than expected outside of its core high-tech markets. Prospects in industries other than semiconductors may find Applied Materials' initial pricing prohibitively high. Applied Materials is in a better financial position than most independent MES/MOM providers for discrete manufacturing, and business viability is not an immediate concern; however, the company is primarily focused on the semiconductor segment. It should be considered in other discrete manufacturing sectors, but we advise buyers to ensure that they can rapidly apply all the features they pay for against quantifiable business returns (from both plant and commercial initiatives) before committing to a premium-priced solution.

Vendor Rating: Positive

Apriso

Apriso (Long Beach, California; privately held) was one of the earliest proponents of a MOM vision that covers multiple vertical industries. Apriso FlexNet is a modern SOA-enabled solution
based on the latest Microsoft .NET technology. Apriso focuses on material supply and management as well as manufacturing execution and drives sales from a top-down approach rather than from the plant floor upward. To achieve this, Apriso has built strong partnerships with local and global consulting companies that can deliver integrated solutions with ERP and Apriso FlexNet. Apriso has continued it partnership with SAP and has been chosen to participate in some industry value network (IVN) partnerships. Gartner believes that Apriso will see real benefit from the partnerships with the global consulting companies, because they see the value of integrating manufacturing into enterprise business processes. Apriso has targeted the automotive, aerospace and defense, mill products, electronics (including medical devices), life science, and consumer goods industries; and FlexNet supports discrete, repetitive, flow and batch modes of production. Apriso has a global presence with operations centers in nine countries in North America, Europe and Asia, with the U.S., Europe, the Middle East and Africa sharing most of its market. Apriso has a strong reputation for delivering reliably and rolling out solutions to multiple client sites. Gartner's primary concern for Apriso is where it goes now. It has grown at a reasonable rate (although, being private, software license revenues are not clear) and has a number of Tier 1 clients. However, it focuses on a wide marketplace, is small (175 employees, including service delivery), and offers solutions similar to the business software companies and control vendors, while not having their financial muscle or stability. Strategically, Apriso is still trying to find a unique position in the market because it falls between the large company models of covering all vertical industries and being a specialist.

Vendor Rating: Positive

Aspen Technology

Aspen Technology (Cambridge, Massachusetts; NASDAQ: AZPN) is beginning to deliver on the promise of the aspenONE integrated solutions. In its target markets — petroleum refiners, chemical producers and pharmaceutical manufacturers — AspenTech is able to leverage not only its MOM solution but its supply chain, engineering and design functionality (including simulation) to deliver a broad MOM solution set. With products finally being consolidated on a single Microsoft-based platform, support and integration will be much simpler than in the past. AspenTech has historically been focused on the technical system buyer in its target markets and has built real credibility with them through the expertise in chemical engineering and software that runs deep in AspenTech. As its solutions become closer to the IT department and integration to ERP solutions becomes a requirement, AspenTech is working hard to build enterprise-level relationships. Because its solutions often complement rather than compete with the large ERP sellers, it is in a position to become a trusted seller in its own domain without fighting SAP, which dominates at the enterprise level in AspenTech's main markets. For those customers where Aspen is a key partner for modeling and simulation, it can leverage these relationships to build a wider enterprise relationship. If it does not do that, it risks that its broad MOM offerings will continue to be bought as point solutions as they were in the past. In continuous processing industries from refining to polymers, AspenTech has a unique set of offerings that are a logical choice for many clients in these industries. However, for those that need less sophisticated solutions and do not require the specialty petrochemical applications offered by Aspen, other less complex and easier to implement MOM solutions are likely to be more cost-effective. With its improved operations and better focus on production management, Aspen Technology justly merits a rating raise.

Vendor Rating: Positive

Broner Metals Solutions

Broner Metals Solutions (Watford, U.K.; privately held) was spun off from Aspen Technology in 2003. It is owned by Hyperion System Engineering, a Cypriot company. Broner offers SCP and
MES solutions to the steel and aluminum industries. It has about 45 clients (with multiple sites for most clients) and adds three to five new clients a year to its installed base. Both products have functionality uniquely suited to the intricacies of metals processes. Competitive products from broader cross-manufacturing solution providers in both MES and SCP lack the key functionality required by the coil and strip business. Although SAP and Oracle have a presence at the ERP level with many Broner customers, where there is functional overlap, most users choose to deploy only the supply chain demand planning and scheduling functionality from the ERP providers, leaving all other mill-centric supply chain planning and execution (typically a two-month planning horizon) and MES functionality with the Broner solutions. The movement to SOA-based platforms by the ERP providers will force Broner to migrate its technology to support these SOA models. Broner has yet to evolve to support a larger MOM functional footprint and is still best classed as an MES for its target industries; however, it is beginning the transition. While it has strong functionality targeted specifically to the market, its technology and limited MOM scope result in a "promising" rating in this area.

Vendor Rating: Promising (applicable to only the metals industry)

Camstar Systems

Camstar Systems (Charlotte, North Carolina; privately held) has continued to show strong growth in its target markets. Camstar's Microsoft-based technology is mature and provides a good basis for a MOM implementation. It is now branded as Camstar Manufacturing for the main MES functions, Camstar Quality, Intelligence and Interoperability for quality, analytics and integration respectively. The entire product offering is directed at Camstar's complete focus on the vertical markets in which it operates. It therefore delivers specific industry suites with out-of-the-box functionality for medical devices, biotech, semiconductor and electronics. Camstar reorganized four years ago to focus on vertical markets, and is showing considerable success particularly in medical devices and semiconductors, but also in other important growth markets such as biotech and solar. In the semiconductor market, Camstar does not try to compete at the new 300 mm fab level but rather succeeds very well in the 200 mm market in Asia. Despite earlier reticence, Camstar has joined SAP's partner network for medical device solutions and achieved SAP Powered by NetWeaver certification. Camstar has a clear focus on driving enterprise-wide sales and has good marketing capabilities to demonstrate the value of its solutions. Camstar recently announced a partnership with PTC for the integration of PLM with manufacturing systems; we will watch this development with interest. Clients in high-tech, biotech and medical devices should consider putting Camstar on their shortlists — other markets such as solar power and metals are less well-developed. We estimate that Camstar has grown to revenue approaching $40 million and, despite the threat from larger enterprise sellers, is starting to build a strong position — particularly in medical devices.

Vendor Rating: Positive

Gemcom Software International

Gemcom Software International (Vancouver, British Columbia, Canada; TSE: GCM) has evolved from its geotechnical software roots to providing broader operations management capabilities to the mining industry. In its market, it views MOM as mining operations management, not manufacturing operations management. Gemcom InSite is the only purely mining-oriented execution and operations package on the market that Gartner has rated. Based on MS SQL Server and Microsoft .NET, the product incorporates a holistic MOM approach to mine operations. Developed with strong customer input, InSite provides operating mines with improved production management and production accounting capability, consolidating data from sources spanning the cycle from mine planning through final product into a single database and delivering information to users through a Web interface. Gemcom has yet to come to grips with the scope
and semantics of MOM, and its marketing is more in line with classic MES (but for the mining sector), although InSite itself has considerable MOM capabilities. Given its very narrow focus on one industry, it is executing well and is rated as "strong positive" — with the caveat that only mining companies should consider the product.

Vendor Rating: Strong Positive (applicable to only the mining industry)

GE Fanuc Automation

GE Fanuc Intelligent Platforms (Formerly GE Fanuc Automation; Charlottesville, Virginia, a joint venture between General Electric and Fanuc) is part of the newly created GE Enterprise Solutions and seen as a strong growth engine for General Electric. It has developed its MES/MOM portfolio like most other automation suppliers — as an outgrowth of its established process control and automation business through acquisition and integration of many components. GE Fanuc serves a broad array of manufacturing industry sectors with its Proficy software product lines. GE Fanuc was a leader among control companies in bringing an integrated MES solution to market; however, this has left it with an older architecture than many. A new SOA-based architecture heavily supported by Microsoft and centered on .NET, Windows presentation and communication foundation, as well as Microsoft's workflow engine, is just starting to be rolled out. GE Fanuc will build composite business applications on this platform and, like many vendors, also has a close relationship with SAP to drive business and ERP integration. Although "powered by NetWeaver," Proficy today offers a full range of MOM functionality, including plant performance and execution, statistical process control and quality control, plant asset management, real-time plant data repository, plant information management, and portal. All these technologies will be gradually incorporated into the new architecture. In the meantime, Proficy is still a technically sound solution that is well proven in GE Fanuc's main industries: automotive, mill products, consumer goods, food and beverage, life sciences, and many discrete industries. Clients with a strong focus on lean manufacturing and Six Sigma should strongly consider GE Fanuc because they will be able to tap into a world of expertise since the culture of these techniques is deeply ingrained in General Electric.

Vendor Rating: Positive

HighJump Software

HighJump Software (Eden Prairie, Minnesota; a division of 3M; NYSE: MMM), acquired by 3M in February 2004, offers a range of MOM and supply chain products. HighJump Software is better known for its supply chain execution solutions than for its original focus — manufacturing execution and operations management products. For industries needing more-supply-chain-focused solutions or for enterprises with supply-chain-centric manufacturing operations that want a single-vendor approach, HighJump may be a suitable choice. No other MOM supplier offers the breadth of warehouse, transportation and other supply-chain-focused products combined with an MOM solution. HighJump is implementing worldwide MES solutions for its parent company, 3M, and through that project, it is investing heavily in new functionality to support batch and discrete manufacturing; however, a compelling MOM vision remains to be articulated. Nonetheless, this will give HighJump a chance to improve the functionality of the Manufacturing Advantage product line, although it still has a way to go to match the best component solution suppliers in the MOM market. Due to its integration with supply chain, it is putting a strong emphasis on traceability applications that go beyond the enterprise. Clients with complex supply chains that need traceability and integration into manufacturing should consider HighJump's unique portfolio.

Vendor Rating: Promising
Honeywell Process Solutions

Honeywell Process Solutions (HPS) is a division of Honeywell (Morristown, New Jersey; NYSE: HON), the large, diversified multinational supplier of aerospace equipment and services, automation and control solutions, specialty materials, and transportation systems. Honeywell is continuing the improvement of its industrial automation and control markets. In the past, we reported that HPS had a broad and deep MES software offering, with products and services for refining, chemicals, oil and gas, pulp and paper, pharmaceutical, and mining and metals market segments. Currently, Honeywell markets three solutions for different segments: OptiVision for pulp and paper, POMSnet for life sciences, and Business Flex for the continuous process industries. These solutions and some of its other software acquisitions during the past few years (Hysys modeling software and operator training solutions in particular) give HPS the potential to build a broad and deep MOM solution that could cover multiple industries. HPS already has gone part of the way with business applications that enable sophisticated integration into ERP, and applications such as maintenance management that can be fully integrated into the process control user interfaces provided by the Experion DCS platform. In the key continuous process solutions that make up nearly 60% of HPS's overall business, there is a strong suite of advanced applications within the Business Flex package. These include production management, event monitoring, advanced process control, product blending and movement, and mass balance applications. Although Honeywell continues to offer good client focus and support, we believe that it will only be seen as a major MOM vendor once it can integrate its solutions into a single suite, at least from a marketing perspective. Selling three separate solutions to non-Honeywell (or existing legacy) customers will prove difficult. Honeywell Experion customers should put Honeywell on their shortlists for MOM applications. Customers in paper and pharmaceuticals should consider the specialist MOM suites from Honeywell. The competition for Business Flex in other continuous processing industries is considerably broader and stronger.

Vendor Rating: Positive

Invensys

Invensys (London, England; LSE: ISYS.L) goes to market with MES offerings for continuous, batch, discrete and hybrid process manufacturing through its Invensys Process Systems (including the Foxboro and SimSci brands) and Wonderware divisions. Invensys' financially distraught past is behind it. It now has a strong focus on controls and integrating the relevant businesses that form Invensys Process Systems. The Wonderware division is one of the oldest and largest MES software providers in the market. It has concentrated on sales through a partner network of more than 3,500 system integrators, of whom 300 are certified for MOM work. Despite being an early entry into the market and probably the first (still existing) MOM solution to be based on Microsoft technology, Wonderware still earns high marks for ease of use and fit across a broad range of vertical applications, providing product and resource tracking, real-time visualization, production and plant history, plus analytical and reporting functions. Invensys is now using the same architecture, Archestra, in its IPS and Wonderware businesses. Its InFusion enterprise control system is aimed at providing enterprise-to-plant connectivity for selected business processes within IPS's main markets, large-scale process industries such as refining and chemicals. The first such business process to be addressed is enterprise asset management. With Invensys' acquisition of Cimnet, further integration between business and plant in the MOM area can be expected. The sales channels for Wonderware and IPS are very different, and we do not yet see Invensys gaining large traction in the difficult process industries where MOM functionality has typically been sold on top of the distributed control solution or by very specialized vendors. However, the capabilities available within Invensys, its quality people and, at last, sound financial position make it a vendor to watch in the market. A streamlined Invensys has established itself as a "positive" vendor.
Oracle

Oracle (Redwood City, California; NASDAQ: ORCL) has established itself as a very credible provider of MOM technology, at least for its E-Business Suite users. The challenge Oracle faces is that it has two other manufacturing-oriented ERP products it acquired via the PeopleSoft and JD Edwards acquisitions, and those two products still require third-party MOM solutions. Over time, as these products become better enabled to leverage Oracle's Fusion Middleware and potentially integrate the Oracle Shop Floor Management, Manufacturing Execution System, Flow Manufacturing and Sensor Edge Server modules, this need may go away. The remainder of this review focuses on these E-Business Suite products because they are the heart of Oracle's MOM strategy. The new Manufacturing Execution System, whether deployed with Oracle Process Manufacturing or with Oracle Discrete Manufacturing, provides rich functionality. Being able to merge data via the SOA Oracle Fusion Middleware products or the Sensor Edge Server provides a data-rich environment. A single integrated ERP and MOM solution offers users a compelling reason to evaluate Oracle on both fronts. For existing Oracle E-Business Suite users, the new MOM functionality delivered with the E-Business Suite products means that, before pursuing third-party MOM solutions, these users should carefully evaluate Oracle's ability to satisfy their requirements. For users deciding on an ERP standard, Oracle's incorporated MOM strategy provides sufficient functionality that should make E-Business Suite a shortlist candidate. If all of Oracle's ERP solutions were able to fully leverage this capability, we would rate Oracle higher than the positive rating we have assigned it in 2007.

Vendor Rating: Positive

OSIsoft

OSIsoft (San Leandro, California; privately held) is a focused provider of real-time data management systems for industries where real-time data is a key to plant performance: oil and gas, power generation, and chemicals, which make up more than 60% of its installed base. The core of OSIsoft's solution has long been the PI System. It captures and stores data from the disparate process automation systems often found in plants. Data can then be transformed for analysis, presentation and decision making at the plant. OSIsoft has repositioned itself as the provider of the Real-time Performance Management (RtPM) platform, a manufacturing intelligence and performance management solution that enables access to manufacturing information in appropriate form and context in real time. OSIsoft has a good track record of developing software, serving clients and extending user value in its niche market. It does not strive to compete with the broad portfolio providers across the MOM spectrum. OSIsoft has exceeded the $100 million mark in annual revenue, invested wisely in product development and built a solid cash position relative to small-to-midsize providers in the MOM segment, making it a viable choice. It is a niche player in the overall MOM market because it concentrates on data capture and analysis rather than being a full-service MOM solution provider. As MOM becomes a more fully integrated offering from some vendors, there is opportunity and risk for OSIsoft. The company has joined SAP's IVN for chemicals (and we believe it will do so for other industries) as a key provider of historical data to the integrated chemicals solution; this will mean that OSIsoft will rely on tighter integration with SAP's NetWeaver platform and xMII manufacturing intelligence product as the basis for growing its MOM opportunity, rather than relying on the stand-alone RtPM platform. OSIsoft has also initiated a reseller agreement where its historian technology is embedded in Rockwell Automation hardware, which is further driving it into discrete manufacturing markets. As an MOM supplier, we rate OSIsoft as "promising"; this does not reflect on OSIsoft's excellence, but rather on the continually increasing scope of MOM in 2007.

Vendor Rating: Promising
Rockwell Automation

Rockwell Automation (Milwaukee, Wisconsin; NYSE: ROK) continues to integrate its broad portfolio of manufacturing operations software into its FactoryTalk environment. In 2007, Rockwell Automation strengthened its MOM marketing message and started to deliver on the promise of FactoryTalk. The integration of some suites, the Propack PMX pharmaceutical suite in particular, is still under way, so some customers will not yet benefit from the FactoryTalk integration. Like the other control and business software providers, Rockwell Automation is building a MOM suite that is applicable across many industries but for now is focusing on automotive, food and beverage, and biopharma sectors where it has a large customer base from its control products. FactoryTalk Integrator and Portal are based on IBM technology (WebSphere and WebPortal) and integrated to the FactoryTalk SOA, giving a well-proven backbone for integration into business systems. Rockwell Automation's traditional partner network was not always best suited to delivering integrated MOM solutions. With its focus on growing its software business to many times its current size, it is recruiting information solution partners from top-tier consulting companies as system integrators. This will further the reputation of an already successful software division and reflects Rockwell Automation's solid management and financial security. Rockwell Automation has a well-earned reputation for unwavering commitment to its customers, and we are sure these values will not be lost as the software business grows.

Vendor Rating: Positive

SAP

SAP (Waldorf, Germany; publicly held and listed on multiple exchanges) has shown a major change in direction since last year's report. While maintaining customers that forgo traditional MES applications due to manual manufacturing operations or relatively simplistic products and processes, SAP has now decided to build its manufacturing-industry-specific solutions based on partnerships with best-of-breed independent software vendors. With the delivery of the Lighthammer acquisition as the xMII product, SAP now has a strong base for integrating these third-party solutions into mySAP ERP, providing one of the few true platforms for building business processes that seamlessly integrate ERP and manufacturing functions. xMII is a strong manufacturing intelligence tool and, along with the specific industry partnerships for the advanced plant-level MOM functionality, SAP customers can look forward to a rapidly maturing MOM solution base in some industries. Of particular interest for discrete manufacturers that operate on lean manufacturing principles, the acquisition of Factory Logic in 2006 and its integration into the xLPO composite application to support lean operations provide powerful new functionality to the SAP MOM solution. The joint development with MES partners of composite manufacturing applications running on the NetWeaver platform will further enhance SAP's ability to take a large share of the growing MOM market. SAP customers should look closely at the IVN partners that SAP has chosen for their industries, and consider whether the benefits of supported integration at the ERP level outweigh the perceived benefits of a chosen best-of-breed solution. The success of the IVN program depends on SAP and its partners' ability to convince its customers that the integration will deliver on its promise. Nevertheless, the progress made to date clearly earns SAP a positive rating in 2007.

Vendor Rating: Positive

Schneider Electric/Citect

Schneider Electric (Paris, France; publicly traded on Euronext Paris), a €16 billion electrical power and control company, acquired the publicly traded Australian MES and supervisory control and data acquisition (SCADA) vendor Citect in March 2006. Gartner saw this as a positive and needed step by Schneider to compete in the MOM space with its control system competitors, all
of whom are working hard to grow their manufacturing software businesses. To date, the progress of integrating Citect into Schneider has been slow. Citect continues to concentrate its main marketing effort with Ampla on its historical strengths in metals and mining, and we see little progress in other industries. Schneider claims that it is using this single industry as a platform for building an integrated MOM offering that can then be rolled out across the other Schneider vertical markets. Gartner would like to see more evidence of this and for Schneider to use the qualities of Ampla within its main strategic drives such as energy efficiency. Schneider has a great record of integrating acquisitions, but it still needs to show the benefits of the Citect acquisition. Ampla remains a worthy player in the MOM space with sound functionality and a modern SOA-focused architecture. While we rate some specialist players on a single market, a company the size and strength of Schneider cannot expect that. We therefore rate Schneider/Citect as promising, with the sincere hope that the acquisition can deliver its potential sooner rather than later.

Vendor Rating: Promising

Siemens

Siemens (Munich, Germany; XETRA: SIE; NYSE: SI) is a multinational, Global Fortune 50 corporation serving a broad range of industrial, utility, medical, transportation, IT and commercial client segments worldwide. The largest supplier of process automation and control technologies in Europe, Siemens Automation and Drives has built an MOM system, Simatic IT, based on multiple software solutions it acquired but re-engineered to be a complete technically competent system. Simatic IT is based on the concept of libraries to define functionality for particular industries or cross-industry requirements (for example, the 21 CFR Part 11 compliance library). Siemens has built a credible execution- and operations-oriented solution that will suit manufacturers that want to deploy MOM in different application areas while maintaining a single solution. During the past year, Siemens has continued to strengthen its marketing message and is clearly winning substantial market share, particularly with large global companies. However, our previous concern over the maturity of industry libraries and the ability to deliver has not gone away. Even large corporations need to have the ability to deploy minimal systems in some plants and complete MOM solutions in others while maintaining the desired level of connectivity and realizing cost savings. Large international conglomerates and Siemens control customers should consider putting Siemens on their MOM shortlists, but they must also ensure that the consulting partners, whether from Siemens or an independent consultancy, are able to deliver global projects on time and at an appropriate cost. In early 2007, Siemens acquired UGS, one of the world's largest PLM companies that also had an MES solution, Tecnomatix. While Gartner believes that the long-term strategy of merging the PLM processes into manufacturing processes will give complex manufacturers more agility and faster time to market, current UGS MES customers will have to plan to move to a different platform in the coming years. While Siemens is making excellent progress, until it shows consistently top-class value for money in delivery and integrating its UGS customers into Simatic IT, it remains with a "positive" rating.

Vendor Rating: Positive

Visiprise

Visiprise (Alpharetta, Georgia; privately held) has been in the MES business for almost 20 years, and can trace its roots back to one of the earliest MES providers, ICC. Since our last report, Visiprise has integrated and harmonized the HMS Software and RSS Solutions with the core product set with the release of a single platform. Visiprise has a clear two-pronged MOM strategy that focuses on the integration of manufacturing operations into ERP and PLM. ERP integration is accomplished through the strong partnership with SAP that goes beyond "Powered by NetWeaver," and now includes integration of manufacturing operations into business processes.
and recognition as SAP’s industry partner for aerospace and defense and high-tech manufacturing, and is resold by SAP in some market segments. The SAP relationship is yielding new opportunities in the SAP community, but non-SAP customers are expressing frustration with the functionality improvement pace. The significant investment that Visiprise has made in technology to be part of the SAP ecosystem has frustrated non-SAP-based Visiprise customers that wanted functional enhancements that have been deferred. Despite excellent vision and a clear long-term MOM strategy, Visiprise is still challenged because of this, but discrete manufacturing clients with a vision of an integrated MOM solution should put Visiprise on their lists of potential suppliers.

**Vendor Rating: Positive**

### Werum Software & Systems

Werum (Lueneburg, Germany, privately held) is a specialized MOM provider focused solely on the pharmaceuticals and biotech market. Werum offers three product suites under the PAS-X brand, all related to pharmaceutical and biotech manufacturers. These are PAS-X Pharma, PAS-X Biotech and PAS-X CT (for managing the production of clinical trial supplies). PAS-X Biotech is the solution for active pharmaceutical ingredient (API) and other fine chemical manufacturing, while the PAS-X Pharma product is for secondary manufacturing of finished goods (pills, doses, liquids and so on). Werum’s strength lies in its total focus on one market and the depth of knowledge and capabilities of its entire 250-plus staff. Werum is SAP’s preferred MES partner for pharmaceuticals and has a substantial installed base built up over its 40-year history. Werum has maintained a high level of customer satisfaction by ensuring that its growth has been manageable and that service delivery and customer support have not been too thinly spread. Werum is privately held by its employees and had revenue of approximately €27 million in 2006. Given its singular focus, strong financials and customer satisfaction, Werum is rated a strong positive, but only pharmaceutical companies should consider this product.

**Vendor Rating: Strong Positive** (applicable only to the pharmaceuticals industry)

### RECOMMENDED READING

"Not All MES Suppliers Are Appropriate for Every Manufacturer"

"Manufacturing Process Management Enhances Workflow Across PLM, ERP and Mom"

"Manufacturing Process Management Poses Some Risks, but Offers Great Rewards"

"Magic Quadrants and MarketScopes: How Gartner Evaluates Vendors Within a Market"

### Vendors Added or Dropped

We review and adjust our inclusion criteria for Magic Quadrants and MarketScopes as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant or MarketScope may change over time. A vendor appearing in a Magic Quadrant or MarketScope one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. This may be a reflection of a change in the market and, therefore, changed evaluation criteria, or a change of focus by a vendor.
**Gartner MarketScope Defined**

Gartner's MarketScope provides specific guidance for users who are deploying, or have deployed, products or services. A Gartner MarketScope rating does not imply that the vendor meets all, few or none of the evaluation criteria. The Gartner MarketScope evaluation is based on a weighted evaluation of a vendor's products in comparison with the evaluation criteria. Consider Gartner's criteria as they apply to your specific requirements. Contact Gartner to discuss how this evaluation may affect your specific needs.

In the below table, the various ratings are defined:

**MarketScope Rating Framework**

**Strong Positive**
Is viewed as a provider of strategic products, services or solutions:

- **Customers:** Continue with planned investments.
- **Potential customers:** Consider this vendor a strong choice for strategic investments.

**Positive**
Demonstrates strength in specific areas, but execution in one or more areas may still be developing or inconsistent with other areas of performance:

- **Customers:** Continue planned investments.
- **Potential customers:** Consider this vendor a viable choice for strategic or tactical investments, while planning for known limitations.

**Promising**
Shows potential in specific areas; however, execution is inconsistent:

- **Customers:** Consider the short- and long-term impact of possible changes in status.
- **Potential customers:** Plan for and be aware of issues and opportunities related to the evolution and maturity of this vendor.

**Caution**
Faces challenges in one or more areas.

- **Customers:** Understand challenges in relevant areas, and develop contingency plans based on risk tolerance and possible business impact.
- **Potential customers:** Account for the vendor's challenges as part of due diligence.

**Strong Negative**
Has difficulty responding to problems in multiple areas.

- **Customers:** Execute risk mitigation plans and contingency options.
- **Potential customers:** Consider this vendor only for tactical investment with short-term, rapid payback.
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